West Clare Railway Greenway
Section 1: Kilrush to Kilkee

NATURA IMPACT STATEMENT

Natura Impact Statement | June 2026

ROD
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TII
Transport Infrastructure Ireland

COMHAIRLE CONTAE AN CHLÁIR | CLARE COUNTY COUNCIL

Tionscadal Éireann
Project Ireland
2040

West Clare Railway Greenway Section 1: Kilrush to Kilkee

Natura Impact Statement

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1. INTRODUCTION

1.1 Background

Roughan & O'Donovan Consulting Engineers (ROD) was appointed by Clare County Council to prepare a Natura Impact Statement (NIS) to inform a planning application for the proposed West Clare Railway Greenway Section 1 ("the proposed development") from Kilrush to Kilkee, Co. Clare.

The requirements arising out of Article 6(3) of Council Directive 92/43/EEC of 21 August 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") in relation to appropriate assessment are transposed into Irish law by Part XAB, Appropriate Assessment (sections 177R to 177AE of the Planning and Development Act 2000 (as amended)) and associated Regulations, and by the European Communities (Birds and Natural Habitats) Regulations 2011 as amended[1] (S.I. No.477 of 2011) (the Habitats Regulations), including Part 5 thereof). In accordance with Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act, 2000 (as amended), an Appropriate Assessment (AA) Screening Report was prepared to assess whether or not the proposed development, either individually or in combination with other plans or projects, was likely to have a significant effect on one or more sites of Community importance for nature conservation ("European sites").

The AA Screening Report, which was prepared by ROD on behalf of Clare County Council concluded, in view of best scientific knowledge and the Conservation Objectives of the sites concerned, that, in the absence of appropriate mitigation, the proposed development had the potential to significantly affect three European Sites, namely the Lower River Shannon SAC, the River Shannon and River Fergus SPA, and the Mid-Clare Coast SPA. For the purposes of Article 6(3) of the Habitats Directive, Clare County Council is required to prepare and submit a Natura Impact Statement (NIS) in respect of the proposed development.

In accordance with Article 6(3) of the Habitats Directive and section 177V of the Planning and Development Act 2000 (as amended), it is the Competent Authority – in this case An Coimisiún Pleanála– which carries out the appropriate assessment (AA) which includes inter alia (i) an examination (ii) an analysis (iii) an evaluation (iv) the making of findings (v) the making of conclusions and (vi) the making of a final determination[2].

This document comprises the NIS in respect of the proposed development and has been prepared by ROD on behalf of Clare County Council. It contains an examination, analysis and evaluation of the likely impacts from the proposed development, both individually and in combination with other plans and projects, in view of best scientific knowledge and the Conservation Objectives of the European sites concerned.

It also prescribes appropriate mitigation to ensure that the proposed development will not adversely affect the integrity of those sites.

Finally, it provides complete, precise and definitive findings which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned and sets out detailed reasons which explain the basis for such findings.

[1] Including inter alia S.I. 290 of 2013; SI 499 of 2013; SI 355 of 2015; the Planning, Heritage and Broadcasting (Amendment) Act 2021, Chapter 4; SI 293 of 2021.
[2] *Waddenzee* (CaseC-127/02) [2004] ECR I-7405; *Commission v Spain* (Case C-404/09) [2011] E.C.R. I-11853; *Sweetman* (Case C-258/11).

The NIS was prepared by Síofra Sealy and reviewed by Patrick O'Shea.

Síofra is a Senior Ecologist with more than seven years' experience in ecological consultancy. She holds a BA (Hons) degree in Natural Sciences (Zoology) from Trinity College Dublin and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

Patrick is an Associate and Ecologist in ROD and has a BA in Natural Sciences (Botany) from Trinity College Dublin and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. He has over 13 years' experience in ecological survey and assessment for infrastructure projects and is a Full Member of the Chartered Institute for Ecological and Environmental Management (MCIEEM).

1.2 Legislative Context

Council Directive 92/43/EEC of the 21st May 1992 on the conservation of natural habitats of wild fauna and flora ("the Habitats Directive") and Directive 2009/147/EC of the European Parliament and of the Council of the 30th November 2009 on the conservation of wild birds ("the Birds Directive") list habitats and species which are important for conservation and in need of protection. This protection is afforded in part through the designation of sites which support significant examples of habitats or populations of species ("European sites"). Sites designated for birds are termed "Special Protection Areas" (SPAs) and sites designated for natural habitat types or other species are termed "Special Areas of Conservation" (SACs). The complete network of European sites is referred to as "Natura 2000".

In order to ensure the protection of European sites in the context of land use planning and development, Article 6(3) of the Habitats Directive provides for the assessment of the implications of plans and projects for European sites, as follows:

> "*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site[3] and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

In *Case C-323/17* [§34*], People Over Wind*, the Court of Justice of the European Union ('the CJEU') referred to the nature of the test to be applied in making a screening determination as follows:

> *"[...] it is settled case-law that Article 6(3) of the Habitats Directive makes the requirement for an appropriate assessment of the implications of a plan or project conditional on there being a probability or a risk that the plan or project in question will have a significant effect on the site concerned. In the light, in particular, of the precautionary principle, such a risk exists if it cannot be excluded on the basis of objective information that the plan or project will have a significant effect on the site concerned (judgment of 26 May 2011, Commission v Belgium, C538/09, EU:C:2011:349, paragraph 39 and the case-law cited). The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project (see, to that effect, judgment of 21 July 2016, Orleans and Others, C387/15 and C388/15, EU:C:2016:583, paragraph 45 and the case-law cited)."*

[3] Including, where applicable, 'sites'.

Further clarification on the use of mitigation measures was provided in *Eco Advocacy*[4], where the CJEU ruled that where constituent elements are incorporated into the design of a project as standard features required for all projects of that nature and not with the aim of reducing negative effects of a project on European sites, those features cannot be regarded as indicative of likely significant effects on European sites concerned and should not be interpreted as mitigation measures intended to avoid or reduce harmful effects of a plan or project on those European sites. The judgment stated that:

> "*In the light of the foregoing considerations, the answer to the fourth question is that Article 6(3) of the Directive 92/43 must be interpreted as meaning that, in order to determine whether it is necessary to carry out an appropriate assessment of the* implications *of a plan or project for a site, account may be taken of the features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site*."

Article 7 of the Habitats Directive provides that the provisions of, inter alia, Article 6(3) are to apply to SPAs under Directive 2009/147/EC (the "Birds Directive"). As stated, the requirements arising out of Article 6(3) of the Habitats Directive are transposed into Irish law by Part XAB of the Planning and Development Act and by the European Communities (Birds and Natural Habitats) Regulations 2011 as amended[5] (S.I. No.477 of 2011) (the Habitats Regulations), including Part 5 thereof, and Part XAB of the Planning and Development Act 2000, as amended. The Planning and Development Act 2024 (Act No. 34 of 2024) was enacted on the 17th October 2024. The commencement of the Act is following a phased approach, with the provisions being rolled out in blocks. At the time of writing (December 2025), the provisions within Part 6 of the Act which deal with the obligation to carry out Appropriate Assessment of projects, have not been commenced.

The determination of whether or not a plan or project requires AA is referred to as "Stage 1" or "AA Screening". A "Stage 1" or "AA Screening" is completed to determine whether or not the proposed development, either individually or in combination with other plans or projects, in view of best scientific knowledge, is likely to have a significant effect on areas designated as being of European importance for nature conservation ("European sites"), thereby enabling the Applicant, to fulfil its obligations under Article 6(3) of the Habitats Directive.

The first threshold is reached if the plan or project is not directly connected with or necessary to the management of one or more European sites. In its ruling in *Waddenzee*[6], the Court of Justice of the European Union (CJEU) interpreted the second threshold as being reached where "*it cannot be excluded, on the basis of objective information, that* [the plan or project] *will have a significant effects on European sites*". Thus, in applying the Precautionary Principle, the CJEU interpreted the word "likely" to mean that, as long as it cannot be demonstrated that an effect will not occur, that effect is considered "likely". A likely effect is considered to be "significant" only if it interrupts or causes a delay in achieving the Conservation Objectives of the site concerned[7].

4 Eco Advocacy v. An Bord Pleanála [2023] C-721/21

[5] Including inter alia S.I. 290 of 2013; SI 499 of 2013; SI 355 of 2015; the Planning, Heritage and Broadcasting (Amendment) Act 2021, Chapter 4; SI 293 of 2021.

[6] Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse vereniging tot Bescherming van Vogels *v.* Staatssecretaris van Landbouw, Naturbeheer en Visserij (Waddenzee) [2004] C-127/02 ECR I-7405.

[7] Conservation Objectives are referred to, but not defined, in the Habitats Directive. In Ireland, Conservation Objectives are set for Qualifying Interests (the birds, habitats or other species for which a given European site is selected) and represent the overall target that must be met for that Qualifying Interest to reach or maintain favourable conservation condition in that site and contribute to its favourable conservation status nationally.

Prior to approval of a plan or project which is the subject of AA (also referred to as "Stage 2"), it is necessary to "*ascertain*" that the plan or project will not "*adversely affect the integrity of the site*". In its guidance document (EC, 2018), the European Commission stated that "*the integrity of a site involves its constitutive characteristics and ecological functions*" and that "*the decision as to whether it is adversely affected should focus on and be limited to the habitats and species for which the site has been designated and the site's conservation objectives*". Regarding the word "ascertain", the CJEU, also in *Waddenzee*, interpreted this as meaning "*where no reasonable scientific doubt remains as to the absence of such effects*". Therefore, the legal test at Stage 2 is satisfied (and the plan or project may be authorised) when it can be demonstrated beyond reasonable scientific doubt that the plan or project will not interrupt or cause delays in the achievement of the Conservation Objectives of the site or sites concerned. AA is informed by a "Natura Impact Report" (NIR) in the case of plans or a "Natura Impact Statement" (NIS) in the case of projects.

The CJEU has made a relevant judgment on what information should be contained within documents supporting AA[8] (in the NIR or NIS):

> *"[The AA] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposed development proposed on the protected site concerned."*

The High Court and Supreme Court[9] have also provided clarity on how competent authorities should undertake AA[10] and has stated that the following four matters require to be addressed:

- First, an appropriate assessment must identify, in the light of the best scientific knowledge in the field, all aspects of the development project which can, by itself or in combination with other plans or projects, affect (a) European site(s) in the light of its conservation objectives;
- Second, there must be complete, precise and definitive findings and conclusions regarding the previously identified potential effects on any relevant European site(s) this and may not have lacunae or gaps. The requirement for precise and definitive findings and conclusions requires analysis, evaluation and decisions. Further, the reference to findings and conclusions in a scientific context requires both findings following analysis and conclusions following an evaluation each in the light of the best scientific knowledge in the field;
- Third, on the basis of those findings and conclusions, the Competent Authority (here An Coimisiún Pleanála) must be able to determine that no scientific doubt remains as to the absence of the identified potential effects;
- Fourth, where the aforesaid three requirements are satisfied, An Coimisiún Pleanála may determine that the proposed development will not adversely affect the integrity of any relevant European site. Accordingly, an appropriate assessment may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where upon the basis of complete, precise and definitive findings and conclusions made, An Coimisiún Pleanála decides that no reasonable scientific doubt remains as to the absence of the identified potential effects.

[8] *Sweetman v. An Bord Pleanála* [2013] Case C-258/11.
[9] See *Kelly (Eoin) v An Bord Pleanála* [2014] I.E.H.C. 400 where the High Court (Finlay Geoghegan J.) held that section 177V(1) of the Planning and Development Act 2000 (as amended) must be construed so as to give effect to Article 6(3) of the Habitats Directive, and hence, an appropriate assessment carried out under section 177V(1) of the 2000 Act must meet the requirements of Article 6(3) of the Habitats Directive as interpreted by jurisprudence of the CJEU case law; *Connelly v An Bord Pleanála* [2018] 2 I.L.R.M 453; [2018] I.E.S.C. 31.
[10] *Kelly v. An Bord Pleanála* [2014] IEHC 422.

In accordance with Regulation 250 of the Planning and Development Regulations and Regulation 42 of the Habitats Regulations, AA must be undertaken by the competent authorities. In Ireland, the competent authority is the relevant public authority for each plan or project (as defined in Part 1 of the Habitats Regulations). Consequently, the responsibility for carrying out AA lies solely with the competent authority. In that respect, the NIS is not in itself an Appropriate Assessment but provides the competent authority with the information it needs in order to carry out its AA.

1.3 Methodology

In accordance with the requirements for AA, this NIS assesses the likely effects of the proposed development on the integrity of the European site(s) "screened in" at Stage 1. This assessment is undertaken in six steps, as follows:

1. Step 1 involves gathering all of the information and data that will be necessary for a full and proper assessment. These include, but are not limited to, the details of all phases of the plan or project, environmental data pertaining to the area in which the plan or project is located, e.g. rare or protected habitats and species or invasive species present or likely to be present, and the details of the European sites within the Zone of Influence.
2. Step 2 involves examination of the information gathered in the first step and detailed scientific analysis of the effects of the plan or project on the ecological structure and function of the receiving environment, focusing on European sites.
3. Step 3 evaluates the effects analysed in Step 2 against the Conservation Objectives of the relevant European site or sites, thereby determining whether or not they constitute adverse effects on site integrity.
4. Having established that the plan or project will adversely affect the integrity of one or more European sites, Step 4 involves the development of appropriate mitigation, including, where appropriate, monitoring and enforcement measures, to eliminate, beyond reasonable scientific doubt, the risk of such adverse effects occurring , as well as consideration of the significance of any residual (post-mitigation) effects.
5. Step 5 involved the assessment of the significance of any residual effects arising from the proposed development in combination with other plans or projects.
6. Step 6 involves the final determination of whether or not the plan or project will adversely affect the integrity of one or more European sites. Notwithstanding the final recommendation made in the NIS, the responsibility for completing this step lies solely with the competent authority.

The following guidance documents informed the assessment methodology:

- EC (2021) Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Environment Directorate-General of the European Commission.
- EC (2018) Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission, Brussels.
- DEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2010) *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular Letter NPWS 1/10 & PSSP 2/10. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

- OPR (2021) Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin.

1.4 Ecological Assessment

In order to fully inform this NIS, it was necessary to establish the baseline ecological conditions in the receiving environment, particularly with regard to European sites. This was achieved by undertaking a number of desktop studies and field surveys and engaging in consultations with the relevant stakeholders, including the National Parks & Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI).

1.4.1 Desk Study

During the desk study, the statutory consultee, the NPWS, provided data on designations of sites, habitats and species of conservation interest. This included reporting pursuant to Article 17 of the Habitats Directive[11] (NPWS, 2025a,b,c and 2019a, b, c) and Article 12 of the Birds Directive[12] (Eionet, 2018), as well as the Site Synopses and Conservation Objectives for the relevant European sites.

The desk study involved a thorough review of existing information relating to ecology in the vicinity of the proposed development and in the surrounding area. A number of web-based geographic information systems (GISs) were used to obtain information relating to the natural environment surrounding the proposed development. These included the NPWS *Map Viewer* (NPWS, 2025), which provided information on the locations of protected sites, the National Biodiversity Data Centre's *Biodiversity Maps* (NBDC, 2025), which provided recent and historic records of rare and protected species in the area.

The following documents were also reviewed as part of the desk study. These documents include, but are not limited to, the following:

- The statutory consultee, the National Parks & Wildlife Service (NPWS), provided information on designations of sites, habitats and species (including birds) of conservation interest. This included reports pursuant to Article 17 of the Habitats Directive[13] (NPWS, 2013a,b) and Article 12 of the Birds Directive[13] (Eionet, 2018), as well as Site Synopses, Natura 2000 Standard Data Forms and Conservation Objectives (including supporting documents) for the relevant European sites.
- The National Biodiversity Data Centre (NBDC) *Biodiversity Maps* (NBDC, 2025) provided records of protected, rare and invasive species.
- Birds of Conservation Concern in Ireland 2020-2026. (Gilbert et al. 2021) and the Irish Wetland Bird Survey Site (I-WeBS) database and Birds of Conservation Concern in Ireland 2014-2019 (Colhoun & Cummins, 2013) were also reviewed.
- The Environmental Protection Agency (EPA) online mapping system provided data in relation to water quality status of water bodies in the vicinity of the proposed development.

[11] Under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive.
[12] Every three years, Member States of the European Union are required by Article 12 of the Birds Directive to report on implementation of the Directive. The most recent reporting available is for the period 2013-2018.
[13] Under Article 17 of the Habitats Directive, Member States of the European Union are required to report to the Commission every six years on the status of Annex I habitats and Annex II species and on the implementation of the measures taken under the Directive.

As with all desk studies, the data considered were only as good as the data supplied by the recorders and recording schemes. The recording schemes provide disclaimers in relation to the quality and quantity of the data they provide, and these were considered when examining outputs of the desk study.

1.4.2 Consultations

Throughout both the design and the environmental assessment processes, there were consultations both with the statutory consultees, the NPWS and IFI, and other relevant stakeholders. These included both written correspondence and meetings.

Consultation allowed for in-depth discussion of ecological sensitivities at specific locations and at specific stages in its construction and operation, as well as discussion of how any ecological impacts would be best mitigated.

A summary of these consultations, relevant to this NIS, is presented in Table 1-1 below. All issues raised by the consultees have been addressed as far as possible in this NIS.

Table 1-1 Consultations

Statutory Consultee	Consultation Date	Details	Summary of Response / Discussions
Birdwatch Ireland	1st November 2018 Email sent to BWI requesting comments on the proposed developments.	5th November 2018 Response received	The following points were made in the response received from Birdwatch Ireland: : • The importance of greenways as a way to reduce car use and for the benefits to health and the environment • International biodiversity loss since the 1970's • Highlighting the declining biodiversity in Ireland • The impacts of disturbance to roosting, foraging and breeding birds • Important considerations for planning applications: the level of usage by people, conservation status of ecological receptors, impact and disturbance assessment, mitigation measures, evidence to support mitigation measures, quality of surveys carried out, consideration of case law.
National Parks and Wildlife Service (NPWS)	22nd September 2021 DAU pre-planning consultation	5th November 2021 Response received	A number of observations were made with the intention of assisting in relation to identifying potential impacts on European sites, other nature conservation sites, and biodiversity and environmental protection in general, in the context of route selection. The observations related to: • Biodiversity Plans • Independent assessment of several sub-sections of a larger project in isolation • Consideration of alternative routes away from European sites • Regarding AA and the absence of lacunae • Impacts to SACs & SPA • Lower River Shannon SAC/SPA - Habitats

Statutory Consultee	Consultation Date	Details	Summary of Response / Discussions
			• Lower River Shannon SAC/SPA - Otter • River Shannon and River Fergus Estuaries SPA • River Shannon and River Fergus Estuaries SPA - Bird data and distribution • River Shannon and River Fergus Estuaries SPA - Assessing impacts • Kilkee Reefs SAC • AA • Greenways constitute a class of road development • Considerations from 'Strategy for the Future Development of National and Regional Greenways' • Consider future developments • Impacts of lighting on wildlife • Threat of invasive species • Protection of mammals • Green infrastructure considerations • Route should implement climate preparedness • Other ecological/natural heritage issues and constraints • No Net Loss • Annex 1 Habitat • Environmental Liability Regulations • Derogation Licenses
Inland Fisheries Ireland (IFI)	22nd September 2021 Pre-planning consultation	24th September 2021	IFI request that any river crossings are clear-span in nature with minimal disturbance to the riparian habitat. IFI advised considering the IFI document 'Planning for Watercourses in the Urban Environment' during the design of the proposed development.
NPWS	18th November 2021	Virtual Meeting	No net loss of habitat should be targeted for the project. The importance of Poulnasherry and surrounding lands for birds was noted. Discussions regarding using screening as mitigation may provide perches for avian predators The issue was raised of the proximity of the emerging preferred route to designated sites and that if impacts cannot be avoided, consent for the project may not be possible. Further consultation will be carried out when detailed survey data has been gathered.
NPWS	1st March 2023	Virtual Meeting	TII National Cycleway Network NIS states that its first preference is that no new construction should occur within 200m of a European Site. This will need to be considered and addressed in all assessment documentation for the scheme.

Statutory Consultee	Consultation Date	Details	Summary of Response / Discussions
			Screening – not as much of a concern in terms of roosts since the sensitivity is wintering birds rather than breeding birds. Cormorant is the only breeding bird that is a Qualifying Interest. New hedgerows might however form a perch for sparrow-hawk. A potential negative impact would be closing off roosting areas for wintering birds at high tide. The importance of monitoring of mitigation during construction and operation was highlighted. CCC / ROD invited NPWS suggestions for ecological enhancements along the route, which could be integrated in the overall project (not limited to Qualifying Interests of designated sites).
NPWS	29th January 2024	Virtual Meeting	NPWS remains concerned about the potential for impact on wintering birds / European sites. Further bird surveys should be carried out to ensure survey currency for planning submission. Vegetation along corridor should be assessed. NPWS raised queries regarding the consideration of bird data during option selection. Query regarding if impacts cannot be adequately mitigated Further consultation is recommended when design has been further progressed
NPWS	20th January 2026	Virtual Meeting	ROD provided a presentation of the proposed mitigation for the Greenway. This focussed on mitigation for bird disturbance (from visual stimuli, physical disturbance, and potential raptor predation). It also included mitigation for mammals, construction phase mitigation, operational phase mitigation and monitoring of mitigation measures.
Birdwatch Ireland	24th February 2026 Pre-planning consultation	Virtual Meeting	Presentation provided on the proposed development, impacts and proposed mitigation. BWI stated that it would be preferrable to avoid shoreline areas entirely. Discussions focussed on bird disturbance and the evidence of effectiveness of proposed mitigation, including, height of screening, noise disturbance from screened users, potential for disturbance from dogs. Other items discussed: cumulative impacts from other activities in the bay, use of IWeBS data sets, potential for bird hides, refusals of other greenways, lighting, ongoing monitoring and implications from monitoring findings, data from other sources which show before and after effects of greenways.

1.4.3 Field Surveys

Field surveys were undertaken in 2021, 2022, 2023, 2024, 2025 and 2026. The purpose of the surveys was to establish the presence, location and distribution of the qualifying interests of European sites, as well as their supporting habitats and species, to the proposed works. The details of the surveys are summarised below in Table 1-2. The surveys which are relevant to Appropriate Assessment are detailed further in this NIS. Those surveys which are not relevant to Appropriate Assessment, i.e. those which do not concern habitats listed on Annex I to the Habitats Directive and species listed on Annex II to the Habitats Directive, or habitats and species which they depend on, have not been included in the NIS.

Table 1-2 Ecological Surveys and Dates

Survey	Date	Informed Appropriate Assessment
Habitats and invasive alien species	September 2021 and 2022 July 2024	Yes
Otter	February 2023 and January/February 2026	Yes
Wintering Bird Surveys	November 2021 – March 2022 October 2022 – March 2023 February – March 2024 October 2025 - March 2026	Yes
Breeding Bird Surveys	April – June 2024	Yes

The surveys adhered to the following guidelines:

- *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.* PE-ENV-01112 (TII, 2009);
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.,* 2011);
- *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd Edition). The Bat Conservation Trust, London (Collins, J. (Ed.), 2023);
- *A Guide to Habitats in Ireland* (Fossitt, J. 2000);
- *Interpretation Manual of European Union Habitats* (EC, 2013);
- Gilbert, G., Gibbons, D.W., & Evans, J. (1998) *Bird Monitoring Methods: A Manual of Techniques for UK Key Species.* The Royal Society for the protection of Birds, Sandy, Bedfordshire, England.
- *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.* CC-ENV-01104. (TII, 2008)

The surveys with relevance to this NIS are described below.

1.4.3.1 Habitats

Habitats were classified in accordance with *A Guide to Habitats in Ireland* (Fossitt, 2000) and mapped following Smith et al. (2011). The proposed development plus a 50m buffer was systematically and thoroughly walked, and all habitats were classified and all habitats and mapped using QGIS. Any Fossitt habitats with links to Annex I habitats were examined further to determine if they corresponded to Annex I habitat. The presence of Annex I habitats, or otherwise, was confirmed using the *Interpretation Manual of European Union Habitats* (EC, 2013). The presence (or signs) of protected fauna, including birds, mammals, amphibians and reptiles were noted during the surveys. Habitat extents were recorded using a mobile mapping device with GPS.

1.4.3.2 Otter

The Otter survey aimed to identify the presence or likely presence of Otter (*Lutra lutra*) in the study area. An Otter survey was conducted, adhering to best practice guidelines (TII, 2008a & b). The route of the West Clare Railway Greenway - Section 1 plus a 50m buffer either side of the route was systematically and thoroughly walked, where accessible. It also included surveying 150m upstream and downstream of all watercourses to be crossed by the proposed development. The survey involved a search for signs of otter activity (prints, spraints, trails, holts, couches, slides, feeding remains etc.). Signs and locations were recorded using a mobile mapping device with GPS.

1.4.3.3 Invasive species

Invasive plants, including species listed on the Third Schedule to the Habitats Regulations, but also other species which can negatively impact biodiversity were recorded during the habitat surveys. Target notes were taken which detailed height, density, and any signs of previous management. Survey findings were recorded using a mobile mapping device with GPS.

1.4.3.4 Birds

Wintering Birds

The shoreline survey methodology followed Gilbert et al. (1998) and the Irish Wetland Bird Survey (BirdWatch Ireland, 2022). Monthly wintering bird surveys were carried out between November 2021 and March 2022, October 2022 and March 2023, February 2023 and March 2024, and October 2025 to March 2026. This provides an extensive multi-annual record of baseline usage of the receiving environment by wintering birds.

Twenty shoreline subsites along the proposed development were surveyed from vantage points. The vantage point locations are presented in Table 1-3 and Figure 1-1Figure 1-1. Each month, each subsite was visited by a surveyor to record waterbirds for two hours either side of high or low tide. In 2020/2021 both high and low tide were surveyed each month. For the other survey seasons, the tidal state for the survey was alternated each month. The purpose of the survey was to record waterbird abundance, occurrence and activity in the study area. The 2020/2021 survey was carried out by one surveyor over two-three days per month. The subsequent survey periods were conducted concurrently by 2-3 surveyors to ensure all subsites were visited. Survey effort, including details of survey duration, tidal state and weather conditions, is presented in Appendix A, Survey Metadata.

For the purposes of these surveys, waterbirds comprised all species of the following taxa: swans, geese and ducks; cormorant, shag, divers and grebes; auks; seabirds; gulls, terns and skuas; herons, egrets and crane; rails and crakes; waders; and kingfisher. The surveyors visited each subsite during daylight hours, and recorded all waterbirds present from a suitable vantage point. Individual flocks of the same species were recorded as separate observations to provide high resolution to the data. However, where birds of the same species were distributed diffusely across the same site, these were recorded as one observation.

Auditory records were also recorded with a best estimation of the location of the bird. For each observation, the date, time, site, species, number of birds, position, activity and any other notes of interest were recorded. 'Position' related to the bird's location relative the coastline. The positions were 'intertidal', 'subtidal', 'supratidal', 'terrestrial' or 'terrestrial-aquatic' Activity was either 'foraging' or 'roosting'. Roosting included all resting, preening and other maintenance behaviours aside from foraging. In addition, any waterbirds observed between subsites and any waterbirds travelling over but not using the subsite were recorded as incidental records. Any raptor observations were also recorded as incidental records.

Table 1-3 Vantage Point Locations

Subsite	Vantage Point	ITM X	ITM Y
Cappagh Pier	VP1	498538	654077
Outer Marina	VP2	498531	654326
Kilrush Marina	VP3	498976	654999
Marina Lock Gates	VP4	498218	654843
Leadmore West Railway Cottage	VP5	497607	654458
Baunmahard Point	VP6	496361	654505
Brews Bridge Beach	VP7	496730	654931
Cammoge Point	VP8	496084	655129
Carrowncalla South	VP9	495654	655971
Carrowncalla North	VP10	495573	657147
Moyasta Bridge	VP11	495716	658590
Moyasta	VP12	494616	658260
Baunmore	VP13	494174	658376
Garraun	VP14	493414	658381
Blackweir Bridge	VP15	492539	658553
Lisdeen East	VP16	491322	658880
Lisdeen Recycling Centre	VP17	490815	658949
Lisdeen Road	VP18	490210	659125
Dough Road	VP19	489598	659381
Kilkee Beach	VP20	488557	660063

Figure 1-1 Vantage Point Locations

Inland surveys were conducted monthly from October 2022 to March 2023, and October 2025 to March 2026 within two hours of high tide. The study area for the inland surveys included the section of the proposed development around Poulnasherry Bay within 200m of the proposed development, or as far north as the N67, whichever was closer. The purpose of the survey was to record the abundance and occurrence of waterbirds in the fields adjacent to Poulnasherry Bay. Birds can be disturbed beyond 200m, depending on the source of the disturbance, the species and other factors, however 200m is considered more than sufficient given the nature of the development and the fact that hedgerows will screen the sources of disturbance from any birds beyond 200m.

The survey was conducted over two consecutive days to minimise changes in bird movements over the month. Survey effort, including details of survey duration, tidal state and weather conditions, is presented in Appendix A, Survey Metadata. The surveyor visited all areas likely to support waterbirds (such as waterbodies and large open fields) during daylight hours and recorded all waterbirds present from a suitable vantage point. For each observation, the date, time, site, species, number of birds, position, activity and any other notes of interest were recorded. The positions were 'on water', 'water's edge', 'wading', 'terrestrial' or 'perched'. Activity was either 'foraging' or 'roosting'. In addition, any waterbirds observed on the way to or from the survey were recorded as incidental records. Any raptor observations were also recorded as incidental records.

Breeding Birds

Breeding bird surveys were conducted in areas of potential breeding wader habitat at four locations, namely Leadmore West, Carrowncalla South, Carrowncalla North and Moyasta. The methodology followed O'Brien and Smith (1992) and Gilbert et al. (1998). Surveys were conducted once per month from April to June 2024 inclusive. During the surveys, transect routes were walked across the areas of suitable habitat and short point counts were used to target any inaccessible areas. Using binoculars, the surveyor scanned the surroundings of each transect/point for waders.

Although waders were the primary focus, any other waterbirds, raptors, ground-nesting birds, Annex I or red listed species encountered were recorded. All target species were mapped and breeding status was assigned following British Trust for Ornithology breeding status codes.

Limitations

Standard survey methods were followed, and any difficulties encountered during the completion of the ecological surveys are detailed here. However, any biases or limitations associated with these methods could potentially affect the results collected. While every effort was made to provide a full assessment and comprehensive description of the study area, ecological trends (e.g., population trends) may not be fully reflected due to the instantaneous/short-term nature of the field surveys. However, the data obtained from field surveys coupled with the desk study provides a robust representation of the baseline for the habitats and species within the Zone of Influence.

Land access was not permitted in the following areas:

- Ch. 2+000 – 2+400
- Ch. 0+950 – 1+150
- Ch. 3+250 – 3+950
- Ch 12+400 – 12+900
- Ch. 13+100 – 13+200

The habitats in these areas are typical of the habitats present along the route and based on aerial photography and views from adjacent lands where access was permitted, they do not contain habitats or species related to Appropriate Assessment that are not considered in the NIS. This is not considered to be a significant limitation for the assessment.

Private homes and gardens within the Study Area were not surveyed, therefore protected species could be present in these areas. However, this is not considered significant as these areas will not be directly impacted by the proposed development.

Wintering waterbird surveys carried out in winter 2021 – 2022 did not include all of the vantage point locations during the December survey. During the surveys from October 2022 to March 2023, some shoreline subsites were prone to sea mist during calm weather, sometimes resulting in restricted visibility for surveyors.

Under these circumstances, subsites were surveyed as best possible from the vantage points with the best visibility. However, due to the wintering bird surveys being undertaken over four seasons, and the abundance of data from other studies of Poulnasherry Bay, the figures for bird abundance and distribution are considered comprehensive and robust.

1.5 Assessment

The ecological baseline which was established by the desk studies and field surveys described above was used to inform the assessment of the potential ecological effects arising from the proposed development, particularly with regard to European sites. Any assumptions that were made in view of gaps in the ecological data were made in accordance with the Precautionary Principle.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Overview

This section provides an overview of the main components of the proposed development. A full description of the proposed development is provided in Appendix B.

The proposed development comprises a walking and cycling amenity along the general route of the abandoned West Clare Railway between Kilrush and Kilkee in County Clare, via the village of Moyasta. The population of County Clare is heavily dependent on carbon intensive transport modes, and this project seeks to provide an alternative means of transport for local trips in the local area, as well as providing a significant amenity facility. The proposed development will enable inter-modal travel for those located along the route, through the provision of a safe walking and/or cycling journey to a key settlement area where public transport can be availed of for a wider, longer distance journey.

The proposed development seeks to, where possible, utilise the former West Clare Railway between Kilrush and Kilkee. The proposed development will create a continuous route between key settlements, providing a safe transport corridor for vulnerable road users which will be predominantly segregated from motorised traffic. It will also provide views across the wider landscape and information for users on both the natural and built heritage of the region along the way.

The proposed development is located in County Clare, commencing in Kilkee town at the western end, travelling eastwards through Moyasta towards Kilrush town. The proposed development is approximately 15.2km long and will predominantly follow the route of the former West Clare Railway corridor. The proposed development will intersect a number of local roads along the route where crossings will be provided. A trailhead will be provided in Kilrush adjacent to the Marina in lands owned by Clare County Council. A smaller trailhead / car park will be provided at Moyasta. There are adequate existing parking and tourist amenity facilities in Kilkee, and no trailhead is proposed there.

The alignment of the proposed development and the receiving environment is shown in drawings *WCGW-ROD-HGN-S1_ML-DR-CH-200501 to 200543,* Appendix C.

Structures

The proposed development includes six bridges, two of which are existing structures to accommodate Greenway and landowners, one greenway overpass, two farm overpasses, three retaining walls and one footbridge, along with some works to culverts.

Drainage

The drainage design has been undertaken to avoid the use of pipework where feasible. Drainage will generally be over the edge. Pipes, culverts and headwalls will be provided as required where the greenway crosses existing field drains and to connect the larger surfaced areas at the trailheads to the drainage network.

Grasscrete shall be incorporated into the parking bays within both trailheads.

2.2 Work Programme

Based on current projections and subject to the satisfactory completion of the statutory procedures and availability of finance, it is anticipated that construction work will commence in 2027. It is anticipated that the construction of the scheme will take between 16 and 24 months, and therefore it is anticipated it will be completed by 2029.

2.3 Working Hours

Normal working hours will be employed during the construction phase as follows:

Monday to Friday 07:00 to 19:00hrs

Saturday 08:00 to 16:30hrs

Sunday and Bank Holidays: not permitted.

Special works, such as for the erection of bridge beams or emergency works outside of the normal working hours will only be permitted with the approval of the local authority.

2.4 Receiving Natural Environment

The receiving environment is dominated by the existing railway corridor which links the towns of Kilrush and Kilkee. The route runs along the coast around Poulnasherry Bay, from Kilrush, through Moyasta and onto Blackweir Bridge. Between Blackweir Bridge and Kilkee, the route travels inland and follows the railway corridor.

This area is surrounded by farmland and Poulnasherry Bay, that is a large intertidal area which is part of the Shannon Estuary. Poulnasherry Bay is internationally important for wintering birds and coastal/ estuarine habitats and is subject to a number of nature designations including designated as an SAC and SPA.

The condition of the railway corridor is variable. The tracks have been removed along the route. In some areas, the former railway line is overgrown with scrub, whereas in other areas it is in use as a farm track.

The proposed development will cross a number of minor watercourses and ditches. The most significant watercourses are the Moyasta Bridge where the railway crossing the river over a large steel structure. The habitats within the immediate vicinity of the proposed development include mudflats, salt marsh, marsh, buildings and artificial surfaces, stonewalls and other stonework, hedgerow, treelines, and improved agricultural grassland.

This section provides a summary of the existing natural environment based on the desk study and field surveys undertaken.

2.4.1 Habitats

The following paragraphs describe the habitats present in the study area. Fossitt habitats which can correspond to Annex I habitats are also presented with an evaluation for whether the Annex I habitat is present. The habitat map is presented in Appendix D.

Desk Study

The Poulnasherry Bay Habitat Assessment Report (Inis, 2021) was reviewed as part of the desk study. This report involved a survey of four coastal sites close to the proposed development. The survey sites are between Carrowncalla South and Leadmore West. The survey focused on the Annex I habitats Perennial vegetation of shingle banks [1220] and Annual vegetation of drift lines [1210]. These habitats were confirmed at two of the sites and are Qualifying Interest habitats of the Lower River Shannon SAC. The closest site where these Annex I habitats were confirmed in this study was 50m to the south of the proposed development.

The County Clare Wetlands Study 2022, (Foss, et al., 2022), the County Clare Wetlands Survey Desk Survey & GIS Preparation (Crushell, & Foss, 2008) and the online Map of Irish Wetlands (Wetlands Survey Ireland, accessed August 2025) were reviewed as part of the desk study. Poulnasherry Bay is the only wetland crossed by the proposed development. Moanmore Lower Cutover Bog and Einagh Cutover are the next closest listed wetlands to the proposed development, which is >500m away and north of the N67.

Field Survey

Buildings and artificial surfaces (BL3)

This habitat type includes the roads, driveway, car parking, buildings and paths. The proposed development will impact existing buildings and artificial surfaces, however such areas are not considered to be of ecological value. This includes some sections of the former railway line which have been converted to hardstanding, as well as existing roads and driveways

CB1 - Shingle and Gravel Banks

This habitat includes coastal areas where shingle (cobbles and pebbles) and gravel have accumulated to form elevated ridges or banks above the high tide mark. This habitat was present at several locations on the shores of Poulnasherry Bay. In general, this habitat was sparsely vegetated and was at the upper levels of cobble/pebble banks, at the seaward boundary of agricultural fields. Species present included Sea Mayweed (*Tripleurospermum maritimum*), Sea Beet (*Beta vulgaris*), Curled Dock (*Rumex crispus*), Creeping Saltbush *(Atriplex portulacoides),* Annual Seablite *(Suaeda maritima),* Sea Aster *(Tripolium pannonicum),* Sea Milkwort *(Glaux maritima)* and Sea Knotgrass *(Polygonum maritimum).*

CB1 habitat may correspond to the Annex I habitat, 'perennial vegetation of stony banks (1220)'. However, the instances of CB1 recorded are not considered to be the annex I habitat due to the lack of positive indicator species present, as per (Martin *et al*., 2017). No positive indicator species or notable species of 1220 habitat were recorded in any of these habitats.

CM (Salt Marshes) CM1 - Lower Salt Marsh and CM2- Upper Salt Marsh

Salt marshes are typically found between the upper limits of the neap and spring tides in protected bays, estuaries, and other sections of sheltered coastline. Lower salt marsh is subject to more prolonged submersion by sea water and is more strongly saline than upper salt marsh - CM2. This habitat was dominated by Common Saltmarsh Grass *(Puccinellia maritima)*, with Sea Plantain *(Plantago maritima),* Glasswort Sp*. (Salicornia sp.,* and Sea Aster also present.

Upper salt marsh is subject to less frequent and less prolonged inundation by the sea and, as a result, is not as saline in character as lower salt marsh - CM1. Vegetation is typically dominated by rushes (particularly *Juncus maritimus* and *J. gerardii*) and Red Fescue (*Festuca rubra).* The exact boundaries between the upper and lower salt marsh habitats is difficult to define. The following is a list of plant species recorded in saltmarsh habitat: Red fescue, Salt Marsh Rush*,* Sea Club Rush *(Bolboschoenus maritimus),* Creeping Saltbush, Common Saltmarsh Grass*,* Scurvy grass *(Cochlearia officinalis),* Sea plantain, Sea milkwort*,* Saltmarsh rush *(Juncus gerardii),* Sea aster and Sea lavender *(Limonium vulgare).*

Areas mapped as upper and lower salt marsh correspond to the Annex I habitats Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330) and Mediterranean salt meadows (*Juncetalia maritimi*) (1410).

CW1 - Lagoons and Saline Lakes

This category includes all enclosed bodies of standing brackish water that are wholly or partially separated from the sea by banks of sand, shingle or rock, or by land barriers of rock or peat. There are three locations where this habitat occurs, all of which are in Carrowncalla South. The first is wholly enclosed by a band of shingle and rock, but only 17m from the bay and likely experiences inundation by the tide during spring high tides. The second is a small lagoon enclosed by the former West Clare Railway line but has a culvert outlet that allows tidal flows in and out of the area. The third area is on the opposite side of the railway line to the above lagoon. It is partially enclosed by areas of saltmarsh but likely has regular inundation during high tides.

CW1 habitat corresponds to the priority Annex I habitat '*coastal lagoons (1150)'. These locations are assumed to be the annex 1 coastal lagoon habitat.

CW2 - Tidal Rivers

This habitat includes the lower reaches of rivers or streams and drainage ditches that are tidal and where there are regular fluctuations in salinity and turbidity, and in the rate and direction of water flow. This includes the sections of watercourses which flow into Poulnasherry Bay which are tidal and the section of the former canal that is affected by the tide.

Tidal rivers correspond to the Annex I habitat, 'estuaries (1130)'. The tidal rivers surrounding the proposed development are highly tidal, have a significant saline influence and are estuarine in nature, therefore these areas correspond to the Annex I habitat 'estuaries' (1130).

ED3 - Recolonising Bare Ground

This category is used for any areas where bare or disturbed ground, derelict sites or artificial surfaces of tarmac, concrete or hard core have been invaded by herbaceous plants. This includes sections of the former railway line that contained disturbed ground with some recolonising vegetation and areas adjacent to the Kilrush wastewater treatment plant.

FS1 - Reed and Large Sedge Swamps

This category includes species-poor stands of herbaceous vegetation that are dominated by reeds and other large grasses or large, tussock-forming sedges. A small area of this habitat was present at Carroncalla North, adjacent to the former railway line in a waterlogged area. This habitat was species poor, dominated by Bulrush (*Typha latifolia*) and Common Reed (*Phragmites australis*).

GA1 - Improved Agricultural Grassland

This category is used for intensively managed or highly modified agricultural grassland that has been reseeded and/or regularly fertilised, and is now heavily grazed and/or used for silage making. This habitat included much of the farmland surrounding the proposed development.

GA2 - Amenity Grassland

This type of grassland is improved, or species-poor, and is managed for purposes other than grass production. It includes amenity, recreational or landscaped grasslands, but excludes farmland. It included fields used for sileage making and livestock grazing.

GM1 – Marsh

Marsh is found on level ground near riverbanks, lakeshores, and in other places where mineral or shallow peaty soils are waterlogged, and where the water table is close to ground level for most of the year. This area was dominated by rushes (*Juncus* sp), Meadowsweet, Yellow Flag Iris and Bulrush.

GM1 Marsh habitat can correspond to the Annex I habitat hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430). However, this area of marsh (located at chainage 14+600, outside of the redline boundary) is not considered to correspond to this habitat due to the low proportion of broadleaved herbs and dominance of rush species.

GS2 - Dry Meadows and Grassy Verge

Dry meadows that are rarely fertilised or grazed, and are mown only once or twice a year for hay are now rare in Ireland. This habitat was present on some sections of the former railway line which were vegetated by grasses and used as farm access tracks. The following species were present in the various sections of this habitat False Oat Grass (*Arrhenatherum elatius*), Common Knapweed (*Centaurea nigra*), Cocksfoot (*Dactylis glomerata*), Sweet Vernal Grass (*Anthoxanthum odoratum*), Glaucous Sedge (*Carex flacca*), Meadow Vetchling (*Lathyrus pratensis*), Red Clover (*Trifolium pratense*), Compact Rush (*Juncus conglomeratus*), Greater Bird's Foot Trefoil (*Lotus pedunculatus*), Bramble (*Rubus fruticosus agg.*), Yorkshire Fog (*Holcus lanatus*), Purple Moor Grass (*Molinia caerulea*), Silverweed (*Potentilla anserina*), Lesser Trefoil (*Trifolium dubium*), Ribwort Plantain (*Plantago lanceolata*), Yarrow (*Achillea millefolium*), Eyebright sp. (*Euphrasia sp*.) and Meadowsweet (*Filipendula ulmaria*).

GS2 habitat can correspond to the following Annex I habitats: 'Species-rich Nardus grasslands on siliceous substrates in mountain areas (and submountain areas in continental Europe)' (6230) and 'Calaminarian grasslands of the *Violetalia calaminariae'* (6130). The former is a priority Annex I habitat. The areas of GS2 surrounding the proposed development are not considered to be examples of the either of these Annex I habitats. Nardus grasslands (6230) occur in the uplands on acidic soils, whereas examples of GS2 surrounding the proposed development are located on the former railway or immediately adjacent to it and not on acidic soils. The habitat 6130 is confined to the vicinity of old metal mines in Ireland (Callaghan & Hodd, 2024) and the proposed development is not close to any old mines.

GS4 - Wet Grassland

This type of grassland can be found on flat or sloping ground in upland and lowland areas. It occurs on wet or waterlogged mineral or organic soils that are poorly-drained or, in some cases, subjected to seasonal or periodic flooding. This habitat included much of the farmland surrounding the proposed development which contained a greater proportion of wet-tolerant species such as rushes. The species present in this habitat included Yorkshire Fog, Soft Rush, Compact Rush, Red Clover, Creeping Buttercup (*Ranunculus repens*), Meadow Buttercup (*Ranunculus acris*), Purple Moor Grass, Great Willowherb (*Epilobium hirsutum),* Silver Weed, Marsh Thistle (*Cirsium palustre),* Common Knapweed, Devils Bit Scabious (*Succisa pratensis),* Sweet Vernal Grass, Selfheal (*Prunella vulgaris),* Ribwort Plantain, Sharp Flowered Rush (*Juncus acutiflorus),* Greater Birdsfoot Trefoil, Docks (*Rumex sp*.), Yellow Flag Iris (*Iris pseudacorus),* Bramble, New Zealand Flax (*Phormium tenax),* Bracken (*Pteridium aquilinum),* False Oat, Tufted Vetch (*Vicia cracca),* Meadowsweet and Purple Loosestrife (*Lythrum salicaria).*

GS4 habitat can correspond to the Annex I habitat 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)' (6410). However, areas of GS2 surrounding the proposed development are not considered to be examples of 6410, due to the lack of indicator species or very small proportion of indicator species. The majority of wet grasslands surrounding the proposed development were dominated by rushes and generally species poor. The species identified above were present across all of the areas of wet grassland in the study area.

HD1 - Dense Bracken

This category is used for areas of open vegetation that are dominated by Bracken. There was a small area of dense bracken, adjacent to the former railway line which has been converted into an access road near the Kilrush wastewater treatment plant.

LS1 - Shingle and Gravel Shores

This category includes exposed or moderately exposed shores with accumulations of loose, coarse but usually rounded and mobile rocky material. This habitat is present at Brew's Bridge Beach and along the coast at Carrowncalla and was unvegetated.

LS1 habitat can correspond to the Annex I habitat 'annual vegetation of drift lines Littoral gravels and sands' (1210). However, this area was unvegetated and therefore does not correspond to 1210.

MW2 - Sea Inlets and Bays

Estuaries are semi-enclosed coastal waterbodies which are usually sheltered and where the influence of freshwater is generally limited. Poulnasherry Bay is an example of this habitat

This habitat corresponds to the Annex I habitat estuaries (1130).

WD1 - (Mixed) Broadleaved Woodland

This general category includes woodland areas with 75-100% cover of broadleaved trees, and 0-25% cover of conifers. The main woodland area was located near Blackweir Bridge. The woodland appeared to be planted and the understorey was dominated by dense bramble. The species present included Ash (*Fraxinus excelsior),* Pedunculate Oak (*Quercus robur),* Italian Alder (*Alnus cordata),* Sycamore (*Acer pseudoplatanus),* Hazel (*Corylus avellana), Bramble,* Soft Rush and Yellow Iris.

WS1 - Scrub

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. There were numerous areas of scrub along the length of the proposed development, including scrub embankments along the railway line and sections where there has been no management of the railway line and scrub has developed. Several fields and field boundaries also included scrub-dominated sections. Areas of scrub were typically dominated by dense bramble, hawthorn and grey willow. Other species present included Ash, Common Spotted Orchid (*Dactylorhiza fuchsia*), Grey Willow (*Salix cinerea*), Hawthorn (*Crataegus monogyna*), Bramble, False Oat Grass, Angelica (*Angelica sylvestris*), Bracken, Bindweed, Marram, Meadowsweet, Rosebay Willowherb (*Chamerion angustifolium*), Cleavers (*Galium aparine*), Blackthorn (*Prunus spinosa*), Soft Rush, Purple Loosestrife.

WS1 habitat may correspond to the Annex I habitat *Juniperus communis* formations on heaths or calcareous grasslands (5130). The scrub habitat surrounding the proposed development did not contain juniper species and therefore does not correspond to the 5130.

FW4 - Drainage Ditches

Drainage ditches are linear water bodies or wet channels that are entirely artificial in origin, and some sections of natural watercourses that have been excavated or modified to enhance drainage and control the flow of water. Drainage ditches are present within the study area, largely bordering agricultural fields. The proposed development will cross several drainage ditches. Several drainage ditches had a tidal influence and some sections contained salt tolerant species such as sea club rush. Those without saline influence contained Common Reed, False Fox Sedge (*Carex otrubae*) and Greater Plantain (*Plantago major*). The banks of drainage ditches were dominated by Bramble, and Creeping Thistle (*Cirsium arvense*).

WL1 - Hedgerows

Hedgerows are linear strips of shrubs, often with occasional trees, which typically form the boundaries of agricultural fields. Hedgerows occur throughout the study area and typically consisted of either Hawthorn (*Crataegus monogyna*) or Grey Willow, and also contained Blackthorn and Bramble. Hedgerows in the study area are generally of low diversity and therefore lower ecological value, however they are essential in maintaining links and ecological corridors between features of higher ecological value.

WL2 - Treelines

Treelines are narrow rows or single lines of trees that are typically planted along roads and property boundaries. Treelines along the proposed development typically comprised the same species as the hedgerows but where they were greater than 5m in height these were classed as treelines. Other treelines also included sycamore, ash and conifer species.

2.4.2 Otter

Desk Study

The NBDC returned several records of Otter (*Lutra lutra*) in the study area. Otter are listed under Annex II and Annex IV of the European Habitats Directive and are also protected under the Irish Wildlife Acts. As per the NPWS Article 17 Reporting, the range, population, habitat and future prospects for this species in Ireland have been assessed as favourable (NPWS, 2019b).

Otter is found throughout Ireland in a wide variety of freshwater and coastal habitats, both in urban and rural environments. The species has two basic requirements: aquatic prey and safe refuges where they can rest. Otter maintain territories and can have a home range of up to 35km (NIEA, 2011: NPWS 2009).

They may also travel several hundred meters outside of these territories to exploit novel prey opportunities (such as nearby pods and marshes). In general, however, this species will exploit a narrow strip of habitat at the aquatic-terrestrial interface (NPWS, 2009).

Field Survey

The mammal survey recorded evidence of otter, including prints and spraint. Otter prints were recorded at two locations in the survey area. One at the mouth of Poulnasherry Bay, one 145m east of the crossing of the proposed development by the Garraun watercourse and close to the shoreline at Carrowncalla South. Two otters were sighted along a shingle and gravel bank on the east side of Poulnasherry Bay, north of Carrowncalla South. Otter spraint was recorded in the same area the otters were seen. No otter holts were recorded in the study area.

Otter was also recorded incidentally during the wintering bird surveys in October 2022 and January 2023, where the surveyor observed otter in the estuary and salt marshes.

2.4.3 Birds

2.4.3.1 Wintering Birds

Desk Study

The proposed development skirts the northern and eastern shores of Poulnasherry Bay. This wetland forms part of the River Shannon and River Fergus estuaries SPA and the Lower River Shannon SAC. The River Shannon and River Fergus Estuaries SPA is designated for 21 Qualifying Interest species as well as 'Wetlands and Waterbirds'. The species are presented in Table 2-1 below with the British Trust for Ornithology (BTO) two-letter species code, current BoCCI (2021) status, and the baseline SPA population.

Table 2-1 Qualifying Interest species of the River Shannon and River Fergus estuaries SPA and their current conservation condition and baseline SPA population.

Qualifying Interest Code	Common Name	Latin Name	BTO code	Current conservation condition[14]	Baseline SPA population[15]
[A017]	Cormorant	*Phalacrocorax carbo*	CA	Amber	93 (n)
[A038]	Whooper Swan*	*Cygnus cygnus*	WS	Amber	118 (n)
[A046]	Light-bellied Brent Goose	*Branta bernicla hrota*	PB	Amber	494 (i)
[A048]	Shelduck	*Tadorna tadorna*	SU	Amber	1025 (n)
[A050]	Wigeon	*Anas Penelope*	WN	Amber	3761 (n)
[A052]	Teal	*Anas crecca*	T.	Amber	2260 (n)
[A054]	Pintail	*Anas acuta*	PT	Amber	62 (n)
[A056]	Shoveler	*Anas clypeata*	SV	Red	107 (n)
[A062]	Scaup	*Aythya marila*	SP	Red	102 (n)
[A137]	Ringed Plover	*Charadrius hiaticula*	RP	Amber	223 (n)
[A140]	Golden Plover*	*Pluvialis apricaria*	GP	Red	5664 (n)

[14] Source: IWM 116, accessed June 2025
[15] Baseline data is from the period 1995/96 – 1999/00. (i) and (n) denote numbers of international and all-Ireland importance respectively
* Denotes Annex I species

Qualifying Interest Code	Common Name	Latin Name	BTO code	Current conservation condition[14]	Baseline SPA population[15]
[A141]	Grey Plover	*Pluvialis squatarola*	GV	Red	558 (n)
[A142]	Lapwing	*Vanellus vanellus*	L.	Red	15,216 (n)
[A143]	Knot	*Calidris canutus*	KN	Red	2015 (n)
[A149]	Dunlin	*Calidris alpina*	DN	Red	15,131 (i)
[A156]	Black-tailed Godwit	*Limosa limosa*	BW	Red	2,035 (i)
[A157]	Bar-tailed Godwit*	*Limosa lapponica*	BA	Red	460 (n)
[A160]	Curlew	*Numenius Arquata*	CU	Red	2,296 (n)
[A162]	Redshank	*Tringa totanus*	RK	Red	2,645 (i)
[A164]	Greenshank	*Tringa nebularia*	GK	Green	61 (n)
[A179]	Black-headed Gull	*Chroicocephalus ridibundus*	BH	Amber	2681 (n)

Numerous waterbird studies have been carried out in the SPA area including Birdwatch Ireland Irish Wetland Birds Survey (IWeBS), the NPWS 2010/2011 Waterbird Survey Programme, with various reports detailing and analysing the survey data. These are outlined in the following sections. Poulnasherry Bay is an IWeBS subsite, and there is an abundance of historic data for this area.

The IWeBs subsite Poulnasherry Bay has the ID no. of 0H498, and includes the entirety of Poulnasherry Bay including the opening into the Shannon coastal waterbody as far as Baurnahard Point, Figure 2-1. This subsite is sometimes split into two smaller subsites, namely Poulnasherry Bay Inner and Outer.

The boundary of the subsites is at the narrowest point in Poulnasherry Bay, between Carrowncalla South on the eastern side and Moughna on the western side. The inner bay is the larger of the subsites.

The labelling of the subsites 0H519 and 0H520 is inconsistent across different studies. Both the NPWS and Birdwatch Ireland were consulted in 2025 in relation to the discrepancies and confirmed the correct labels for the subsites. The errors in the original sources have been corrected in this report. For avoidance of doubt, 0H520 is the inner bay, which is significantly larger and more important for wintering birds than 0H519, which is the outer bay (Table 2-2).

Table 2-2 Labelling for subsites in Poulnasherry Bay.

Subsite Code	Subsite Name	SS Grid	Subsite area (ha) as per CO supporting doc
0H520	Poulnasherry inner bay	Q9450057300	675.72
0H519	Poulnasherry outer bay	Q9570055000	143.43

Figure 2-1 **Poulnasherry Bay IWeBS subsite 0H498 boundary. Source: Irish Wetland Birds Survey.**

A summary of the studies with data for Poulnasherry bay are presented in this section. These include the following:

- The Irish Wetlands bird survey (IWeBs) data and reporting (Burke et al, 2025)
- The 2010/11 waterbird survey programme (Crowe et al., 2012).
- Review and Assessment of Waterbird Data from the Shannon-Fergus Estuary (Lewis et al 2016).
- The Poulnasherry Bay Waterbird survey 2021-2022 (Inis Environmental, 2022).
- Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) final report 2019 (MKO, 2019).

Other regularly occurring waterbirds which are not Qualifying Interests of the SPA are presented below in Table 2-3.

Table 2-3 **Regularly occurring waterbirds in the SPA which are non-Qualifying Interest species. * Denotes Annex I species**

Common Name	Latin Name	Peak Number (2005/06 – 2009/10) (I-WeBS)	BTO code	Current conservation condition[16]
Mute Swan	*Cygnus olor*	135 (i)	MS	Amber
Greylag Goose	*Anser anser*	140	GJ	Amber
Mallard	*Anas platyrhynchos*	289	MA	Amber
Pochard	*Aythya ferina*	37	PO	Red
Tufted Duck	*Aythya fuligula*	93	TU	Amber
Goldeneye	*Bucephala clangula*	17	GN	Red

[16] Irish Wildlife Manual 116, V4.0 June 2025

Common Name	Latin Name	Peak Number (2005/06 – 2009/10) (I-WeBS)	BTO code	Current conservation condition[16]
Red-breasted Merganser	*Mergus serrator*	7	RM	Amber
Great Northern Diver *	*Gavia immer*	8	ND	Amber
Little Grebe	*Tachybaptus ruficollis*	7	LG	Green
Great Crested Grebe	*Podiceps cristatus*	31	GG	Amber
Little Egret *	*Egretta garzetta*	29	ET	Green
Grey Heron	*Ardea cinerea*	23	H.	Green
Moorhen	*Gallinula chloropus*	33	MH	Green
Coot	*Fulica atra*	51	CO	Amber
Oystercatcher	*Haematopus ostralegus*	81	OY	Red
Snipe	*Gallinago gallinago*	115	SN	Red
Turnstone	*Arenaria interpres*	57	TT	Amber
Common Gull	*Larus canus*	83	CM	Amber
Lesser Black-backed Gull	*Larus fuscus*	16	LB	Amber
Herring Gull	*Larus argentatus*	8	HG	Amber
Great Black-backed Gull	*Larus marinus*	8	GB	Green

Irish Wetland Bird Survey (IWeBS)

Birdwatch Ireland provided IWeBS data for the subsite 0H498 Poulnasherry Bay in August 2025. Some survey seasons report counts for the overall site, whereas others split the data between the two smaller subsites. The dataset for the overall subsite is incomplete for recent years. The most recent survey season is 2020/21 and during this season only the months November, December and January have count data. In the 2019/20 season, only January was counted. 2017/18 is the most recent survey period in which all months were surveyed, however this was for the outer bay subsite (0H519) only. During this season, numbers exceeding the 1% threshold for all-Ireland Importance were recorded for Shelduck, Knot, Dunlin and Curlew.

Population trend data from the Irish Wildlife Manual 162, The status and distribution of wintering waterbirds in Ireland (2025) was also utilised in this assessment.

Conservation Objectives Supporting Document (NPWS, 2012e)

The Conservation Objectives supporting document (NPWS 2012e) presents the conservation objectives for the SPA. Part Five of this document includes an examination of the 2010/11 Waterbird Survey Programme. Key findings of these reports for Poulnasherry Bay are summarised in the following sections.

The 2010/11 Waterbird Survey Programme (Crowe et al, 2012)

The 2010/11 waterbird survey programme investigated how waterbirds are distributed across coastal wetland sites during the low tide. Specific information for the Shannon and Fergus estuary sites is provided in the Conservation Objectives Supporting Document (NPWS, 2012e).

The Waterbird Survey Programme split the IWeBS subsite 0H498 into the two smaller subsites into Poulnasherry Outer Bay (0H519) and Poulnasherry Inner Bay (0H520).

Poulnasherry inner bay (0H520) was ranked as the second most important subsite within the SPA for species richness. The site had a mean value of 25 species and a peak of 31 species. The importance of the two subsites for each Qualifying Interest species relative to the other SPA subsites is presented below in Table 2-4. This data is extracted from Table 5.6 (a) of the Conservation Objectives Supporting Document (NPWS, 2012e).

Table 2-4 Importance of subsites for Qualifying Interest species in the River Shannon and River Fergus Estuaries SPA for low tide surveys across all habitats (Intertidal, Subtidal, intertidal/subtidal combined) and behaviours (foraging/ roosting/ other). L Low, M Moderate; H High V Very high. Blank indicates the species was not recorded in that subsite.

Subsite	Species (BTO code)																				
	WS	PB	SU	WN	T	CA	RP	GP	GV	L.	KN	DN	BW	BA	CU	GK	RK	PT	SV	SP	BH
0H520 Inner Bay	**V**	H	**V**	H	V	M	H	L	**V**	H	H	H	M		H	H	H	**V**	M	**V**	M
0H519 Outer		**V**				H								L	L		L				L

The inner bay (0H520) was ranked No. 1 for highest numbers of three species; Teal, Pintail and Shoveler, during high tide across all of the River Shannon and River Fergus Estuaries subsites during the surveys (Table 5.6 (f) of the CO supporting document (NPWS, 2012e)). Scaup was the least-widespread occurring species across the SPA but occurred mostly in Poulnasherry Inner Bay.

Appendix 11 of CO supporting document (NPWS, 2012e) details the types of disturbance to waterbirds which occurred during the surveys. Types of disturbance noted at subsites 0H519 and 0H520 included horse riding, hand-gathering molluscs, and intertidal aquaculture. All of these types of disturbance were assigned a moderate level of disturbance.

Review and Assessment of Waterbird Data from the Shannon-Fergus Estuary (Lewis *et al*., 2016).

The data relating to the overall IWeBS subsite Poulnasherry Bay (0H498) was reviewed. This study covered the overall subsite and does not split the data between the inner and outer bays. This subsite was surveyed for 11 seasons in IWeBS to 2016 since the baseline period (1995/96 – 1999/00). In this subsite 0H498 has recorded a total of 63 species throughout I-WeBS surveys at the site.

It has supported internationally important numbers of the Qualifying Interest species Light-bellied Brent Goose, and nationally important numbers of 12 SCI species: Bar-tailed Godwit, Cormorant, Curlew, Dunlin, Greenshank, Golden Plover, Grey Plover, Knot, Lapwing, Pintail, Ringed Plover and Wigeon.

Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 2019

The surveys undertaken during 2017 and 2018 as part of the SIFP aimed to record bird usage across the entire Shannon and Fergus estuary and to allow for comparison of data between subsites. Area K in this study corresponds to the IWeBS subsites 0H519 and 0H520. This area was highly important for a number of Qualifying Interest species as it contained high percentages of the total counts for species across the entire estuary. These were 62% for Brent Goose, 38% for Bar-tailed Godwit and Knot, 20% for Shelduck and 19% for Ringed Plover. The rest of the Qualifying Interest species were below 10%.

The **Poulnasherry Bay Waterbird survey 2021-2022**[17] (Inis Environmental, 2022) carried out waterbird surveys of Poulnasherry Bay during the 2021/2022 winter season. This survey followed the methodology of the NPWS waterbird survey programme. Subsite 0H498 was split into Poulnasherry Inner Bay (0H519), and, Poulnasherry Outer Bay (0H520) for the surveys. It drew on survey data gathered in the winter seasons since 2018. The report compared the data gathered to baseline survey data from 1995/1996 and 2010/2011. A comparison of peak species counts showed that population trends 16 of the 21 Qualifying Interest species were in decline since the baseline period. Teal was the only species to show an increase in population since the baseline period. The remaining four species populations were assessed as stable/variable as no trend could be determined. The subsite 0H519, Poulnasherry Inner Bay was found to be the most important subsite in the survey area. It was noted that the inner parts of the subsite, areas near freshwater flows and salt marshes were important for high tide roosting.

Field Survey

Wintering Birds

This section summarises the findings of the wintering bird surveys carried out for the proposed development. All of the Qualifying Interest species of the SPA were recorded during the surveys apart from Whooper Swan and Scaup, which were not recorded during any of the surveys for the proposed development. The numbers of Qualifying Interest species recorded within Poulnasherry Bay during the survey periods exceeded 1% thresholds of the SPA baseline population during at least one survey period for all Qualifying Interest species recorded, excluding Black-tailed Godwit. Table 2-5 lists the bird species identified across all of the wintering bird surveys carried out for the proposed development since 2021. The peak count for each survey season is also presented and it is indicated where the peak counts exceeded 1% of the SPA baseline population.

Table 2-5 Peak counts of wintering bird species identified during shoreline surveys. Peak count is the month where the highest number of that species were recorded across all VPs. The numbers in bold indicate where the numbers recorded exceeded 1% of the overall SPA population.

Common Name	SPA Baseline Population	2021 / 2022	2022 / 2023	2024	2025 / 2026
Bar-tailed Godwit	460	0	**63**	**57**	21
Black-headed Gull	2681	**580**	**164**	15	**334**
Black-tailed Godwit	2035	4	7	1	4
Brent Goose	494	**205**	**101**	**165**	**182**

[17] This study notes the confusion of the subsite labelling in the site's conservation objectives documents. This study has reported the data correctly as per the confirmation received from NPWS in October 2025, with the inner bay being the more important of the two subsites.

Common Name	SPA Baseline Population	2021 / 2022	2022 / 2023	2024	2025 / 2026
Common Gull	N/A	125	17	2	114
Cormorant	93	**4**	**117**	**5**	**25**
Curlew	2296	**120**	**322**	**135**	**258**
Dunlin	15131	100	**861**	**750**	**1030**
Eider	N/A	20	0	0	0
Golden Plover	5664	2	**130**	**1055**	**1352**
Great Black-backed Gull	N/A	0	6	6	10
Great Crested Grebe	N/A	0	10	4	3
Great Northern Diver	N/A	3	6	8	7
Greenshank	61	**8**	**12**	**15**	**8**
Grey Heron	N/A	10	9	3	6
Grey Plover	558	0	**92**	**5**	0
Herring Gull	N/A	48	143	83	296
Lapwing	15,216	**329**	**388**	0	**1190**
Lesser Black-backed Gull	N/A	3	35	7	12
Little Egret	N/A	14	33	22	31
Little Grebe	N/A	0	2	0	6
Mallard	N/A	38	68	22	32
Oystercatcher	N/A	44	84	27	137
Pintail	62	**2**	**30**	0	0
Red Knot	2015	0	**45**	0	**130**
Red-breasted Merganser	N/A	0	3	1	0
Redshank	2,645	**76**	**102**	**145**	**180**
Ringed Plover	223	**74**	**30**	**7**	**96**
Sanderling	N/A	0	55	0	51
Shag	N/A	0	1	1	0
Shelduck	1025	**181**	**289**	**124**	84
Shoveler	107	**3**	**5**	0	70
Snipe	N/A	14	55	9	19
Teal	2260	**280**	**440**	**260**	**324**
Turnstone	N/A	25	49	2	283
Wigeon	3761	**306**	**702**	**84**	**728**

The following species were recorded occasionally and have been excluded from the table above. These are presented below in Table 2-6, with the peak count and the survey period they were recorded. These species are considered to not occur regularly or in small numbers in Poulnasherry Bay.

Table 2-6 Occasionally recorded species (single observation).

Species	Count	Observation Details
Tufted Duck	8	2022/23 – single observation. 2025/26 – single observation. *Note: Tufted Duck are reported to be a regularly occurring species within the wider area of the SPA but were not regularly recorded within the survey area.*
Common Sandpiper	1	2022/23 – recorded at several vantage points on more than one date.
Curlew Sandpiper	2	2024 – single observation.
Black Guillemot	3	2022/23 – recorded at several vantage points on one date.
Stone-curlew	3	2024 – single observation.
Whimbrel	9	2025 – single observation.

Nine locations along the route of the proposed development were identified as sensitive bird areas. The sensitive bird areas are around Poulnasherry Bay where the proposed development is close to the coast and where there is no existing screening or, incomplete screening, and therefore could be impacted by the proposed development. Important areas for birds which are not close to the greenway are excluded. The sensitive bird areas are presented below in Table 2-7, an overview of the areas is shown in Figure 2-3, and are further detailed in Appendix E. Merchant's Quay in Kilrush and Brew's Bridge beach is not included as a sensitive bird area due to the existing high level of disturbance, anthropogenic activity and habituation.

Table 2-7 Sensitive bird areas

Location	Chainage	Area Details
1	5+300 – 5+800	This section follows the coast for 370m. There is a low embankment with vegetation between the proposed development and the coast. There are some gaps in the vegetation.
2	6+100 – 6+750	This section includes a field where the greenway follows the coast and where there is no screening for 120m. The route then travels inland and follows the line of the railway east. There is a thick hedgerow on the seaward side of the proposed greenway for 270m. Birds have been recorded within fields adjacent to the proposed greenway at this location.
3	7+000 – 7+250	This section is on the former railway line which is immediately adjacent to a small inlet of the Bay and SPA, the adjacent habitat is dominated by saltmarsh habitat. There is no screening on the seaward side of the railway line.
4	7+750 – 8+200	This section includes Moyasta Bridge and causeway where the former railway crosses part of Poulnasherry Bay and SPA. Exposed mudflats and salt marsh are present adjacent to both sides of the proposed development.
5	8+450 – 9+250	The proposed development is on the former railway line. This section is bordered by fields on the east side with no existing screening to the bay.

Location	Chainage	Area Details
6	9+600 - 9+800	This section includes an area where the greenway will be on an existing road and no works will be carried out. This is adjacent to an area where workers access the intertidal area.
7	9+950 – 10+400	Carrowncalla North, includes a section with no existing screening, apart from c.120m where the route of the proposed development cuts inland to avoid intertidal habitats.
8	10+550 – 11+550	Carrowncalla North – to South, this section is within agricultural fields adjacent to the Poulnasherry Bay with no existing screening or minimal screening.
9	14+150 – 14+850	West of Kilrush Marina, the proposed development is along the coast within the railway corridor. There is existing screening along this section.

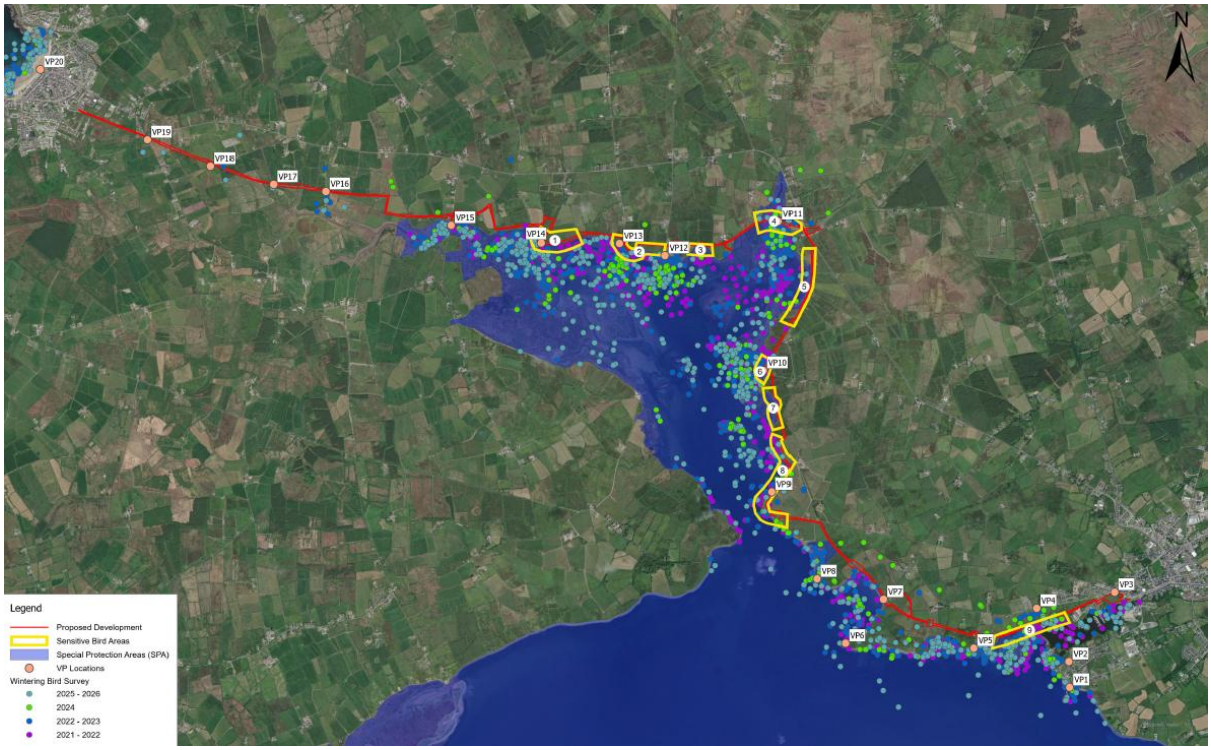

Figure 2-3 Sensitive Bird Areas

At Moyasta Bridge (Sensitive Bird Area No.4), the proposed route is elevated and there is no existing screening between it and the surrounding mudflats. Large numbers of wintering birds were recorded in the surrounding mudflats, including nationally important numbers (>1% of the national population) of Pintail and Wigeon within 500m of Moyasta Bridge. The peak counts recorded within 500m of Moyasta Bridge correspond to 42% of the SPA population of Pintail, 15% for Wigeon, 11.5% for Greenshank and 10.7% for Teal. The following species were recorded within 500m of Moyasta Bridge in numbers between 1-10% of the SPA population: Bar-tailed Godwit, Brent Goose, Cormorant, Curlew, Golden Plover, Redshank, Shelduck and Shoveler. Table 2-8 sets out the frequency that significant numbers of QI species were recorded at Moyasta within 500m of the bridge.

Table 2-8: Frequency that QI species were recorded in significant numbers at Moyasta bridge.

Species	No. of surveys recorded at VP 11 (of 18 total surveys)	Count >1% of National population	1% SPA Population	No. Counts >1% SPA Population	Sensitivity
Bar-tailed Godwit	5	No	4.6	2	Moderate
Brent Goose	6	No	4.94	4	High
Cormorant	6	No	0.93	6	Moderate
Curlew	16	No	22.96	7	High
Greenshank	10	No	0.61	10	High
Pintail	7	Yes	0.62	7	Moderate
Teal	14	No	22.6	10	Moderate
Wigeon	15	Yes	37.61	10	High

2.4.3.2 Breeding Birds

Field Surveys

Breeding bird surveys were conducted in April, May and June 2024. All birds observed were assigned a BTO breeding status. Table 2-9 lists the bird species identified on the breeding bird survey for observations of possible, probable and confirmed breeding birds. Any non-breeding observations have been excluded.

Table 2-9 Confirmed, probable and possible breeding records

Common Name	Number	Date, Location	Details	BoCCI Status (2020 – 2026)
Confirmed Breeding				
Ringed Plover	3	02/07/2024 vp5	Fledged young; confirmed breeding. possibly two recently fledged young seen running and flying.	Amber
Probable Breeding				
Shelduck	4	26/04/2024 VP5	Pair; probable breeding. 2 pairs.	Amber
Mallard	4	26/04/2024 VP5	Pair; probable breeding.	Amber
Mallard	5	26/04/2024 VP8	Pair; probable breeding.	Amber
Ringed Plover	2	02/07/2024 VP8	Agitated behaviour; probable breeding. mobbing common gull, made alarm calls when surveyor walked past.	Amber

Common Name	Number	Date, Location	Details	BoCCI Status (2020 – 2026)
Grey Wagtail	2	02/07/2024 VP11	Pair; probable breeding.	Red
Possible Breeding				
Oystercatcher	5	26/04/2024 VP5	Suitable nesting habitat; possible breeder.	Red
Shelduck	25	26/04/2024 VP9	Suitable nesting habitat; possible breeder.	Amber
Shelduck	1	31/05/2024 VP5	Suitable nesting habitat; possible breeder.	Amber
Herring Gull	2	31/05/2024 VP5	Suitable nesting habitat; possible breeder.	Amber
Oystercatcher	17	31/05/2024 VP5	Suitable nesting habitat; possible breeder.	Amber
Dunlin	2	31/05/2024 VP5	Suitable nesting habitat; possible breeder.	Red
Ringed Plover	1	31/05/2024 VP5	Suitable nesting habitat; possible breeder.	Amber
Ringed Plover	1	31/05/2024 VP9	Suitable nesting habitat; possible breeder. Flushed, on a stoney beach but unlikely to be breeding.	Amber
Shelduck	2	31/05/2024 VP10	Suitable nesting habitat; possible breeder.	Amber
Black-headed Gull	2	02/07/2024 VP7	Suitable nesting habitat; possible breeder.	Amber
Herring Gull	4	02/07/2024 VP7	Suitable nesting habitat; possible breeder.	Amber
Common Gull	1	02/07/2024 VP8	Suitable nesting habitat; possible breeder.	Amber
Shelduck	1	02/07/2024 VP8	Suitable nesting habitat; possible breeder.	Amber
Oystercatcher	3	02/07/2024 VP8	Suitable nesting habitat; possible breeder.	Amber
Grey Heron	1	02/07/2024 VP9	Suitable nesting habitat; possible breeder.	Green
Little Egret	2	02/07/2024 VP10	Suitable nesting habitat; possible breeder.	Green
Shelduck	1	02/07/2024 VP10	Suitable nesting habitat; possible breeder.	Amber
Little Egret	7	02/07/2024 VP11	Suitable nesting habitat; possible breeder.	Green
Teal	10	02/07/2024 VP11	Suitable nesting habitat; possible breeder.	Amber

2.4.3.3 Incidental Recordings

During the surveys, incidental recordings of species of interest other than waterbirds were also recorded. These are presented in Table 2-10 below.

Table 2-10 Incidental records of birds of prey and kingfisher.

Species	Survey*	No. sightings	Observations	Designations (Habitats Directive, BOCCI)
Kestrel *Falco tinnunculus*	WB 2025/26	8	Sighted over improved agricultural grasslands and wet grasslands – hunting and travelling	N/A, Red
	WB 2024	3	Sighted over improved agricultural grasslands – mobbed, perched, with prey	
	BB 2024	2	improved agricultural grassland; carrying prey improved agricultural grassland; hunting, male	
	WB 2022/23	2	improved agricultural grassland; hunting wet grassland; perched	
	WB 2021	1	In flight	
Hen Harrier *Circus cyaneus*	WB 2024	1	Improved agricultural grassland; hunting, male	EU HD Annex I, Amber
	WB 2022/23	2	Improved agricultural grassland, mixed sediment shores and open marine water; hunting, male. Improved agricultural grassland; travelling, male, VP12.	
	WB 2021	1	In flight, along coast at Moyasta Bridge.	
	WB 2025/26	3	Various habitats, female.	
Peregrine Falcon *Falco peregrinus*	WB 2024	1	Improved agricultural grassland and wet grassland; travelling.	EU HD Annex I, Green
	BB 2024	1	Estuaries, sheltered rocky shores and improved agricultural grassland; hunting, adult.	
	WB 2022/23	1	Marsh; travelling, juvenile.	
Sparrowhawk *Accipiter nisus*	WB 2025/26	2	Improved agricultural grassland; travelling, mobbed, mobbed by passerines.	N/A, Green
	BB 2024	1	Improved agricultural grassland and conifer plantation; carrying prey.	
	WB 2022/23	1	Improved agricultural grassland; travelling.	
Kingfisher *Alcedo atthis*	WB 2022/23	1	Watercourses; travelling, flew up channel (VP11).	EU HD Annex I,

Species	Survey*	No. sightings	Observations	Designations (Habitats Directive, BOCCI)
				Amber
Merlin *Falco columbarius*	WB 2025/26	1	Wet grassland; travelling.	EU HD Annex I, Amber
	WB 2022/23	1	Improved grassland; hunting.	
White-Tailed Sea Eagle	WB 2025/26	1	Improved agricultural grassland and sea inlets and bays; flying, mobbed, juvenile.	N/A, Red

*WB – wintering bird survey; BB – Breeding bird survey

2.4.4 Aquatic Habitats and Species

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (the Water Framework Directive or 'WFD') requires that each Member State protect and improve water quality in all waters so that good ecological status is achieved. Additionally, proposed actions (within discrete River Basin Management Plans) are also required, to secure the national natural water resources for the future. The EPA is the competent authority responsible for monitoring, protecting, and improving the water environment in the Republic of Ireland.

In accordance with WFD guidelines, water quality 'Status' is assigned using a variety of available data on aquatic flora and fauna (including fish), the availability of nutrients, and aspects like salinity, temperature and pollution by chemical pollutants. Morphological features, such as quantity, water flow, water depths and structures of the riverbeds, are also taken into account.

The EPA's online map viewer provides access to information at individual waterbody level in Ireland. Waterbodies can relate to surface waters (these include rivers, lakes, estuaries [transitional waters], and coastal waters) or to groundwater. The EPA is responsible for monitoring the quality of all waterbodies in Ireland and these results are available online. The results of water quality monitoring are presented in Table 2-11.

Table 2-11 WFD Water Monitoring Results

WFD Waterbody	Waterbody name	WFD Status 2016-2021	Waterbody Risk
Kilkee_Lower_010	Dough	Moderate	Review
Termon_East_010	Lisluinaghan	Good	Review
Termon_East_010	Garraun	Good	Review
Moyasta_010	Lismuse	Moderate	Review
Mouth of the Shannon (coastal waterbody)	Mouth of the Shannon	Good	Not at risk
IE_SH_G_123 (Ground waterbody)	Kilrush	Good	Not at risk

2.4.4.1 Aquatic Species

Desk Study

Brook Lamprey (*Lampetra planeri*), Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*) and Atlantic Salmon (*Salmo salar*) have all been recorded spawning in the Lower Shannon and its tributaries (NPWS, 2013). The NBDC returned no records of these aquatic species in the study area of the proposed development (NBDC, 2025). However, migratory species such as Sea Lamprey, River Lamprey and Atlantic Salmon migrate through the mouth of the Shannon Coastal Waterbody to reach spawning grounds in the Shannon system, therefore, these species may also occur in Poulnasherry Bay.

As lamprey species and Salmon could be present in waterbodies crossed by the proposed development, impacts to these species have the potential to be impacted by the proposed development.

2.4.5 Invasive Species

Desk Study

Table 2-12 below lists the invasive plant species records obtained from the NBDC within the search area. Records for species which are listed on the Third Schedule of the European Communities (EC) (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477/2011)) are presented.

Table 2-12 Invasive species. Source: NBDC (2025).

Common name[18]	Scientific name
High Impact Species	
Giant Rhubarb	*Gunnera tinctoria*
Common Cord-grass	*Spartina anglica*
Japanese Knotweed	*Reynoutria japonica*
Rhododendron	*Rhododendron ponticum*
Medium Impact Species	
Himalayan Knotweed	*Persicaria wallichii*
Three-cornered Garlic	*Allium triquetrum*

Field Surveys

Japanese knotweed (*Reynoutria japonica)* was recorded at several locations surrounding the proposed development, during the field surveys. Details of the areas of infestation are presented below in Table 2-13 and shown in Figure 2-4.

[18] ** denotes Regulation S.I. 477 (Ireland) – Invasive Species listed on Third Schedule of the European Communities (EC) (Birds and Natural Habitats) Regulations, 2011.*

Table 2-13 Japanese Knotweed recorded during the field surveys.

Reference	ITM X	ITM Y	Location	Description
1	*497796*	*654556*	Kilrush, former railway line adjacent to Kilrush Wastewater Treatment Plant.	3x3m stand in an area of scrub along a path.
2	*498685*	*654869*	Kilrush, former railway line to rear of houses between Merchant's Quay and Shankyle Road.	Two very large dense stands, 5x20m and 5x10m.
3	*498710*	*654880*		
4	*498829*	*654920*	Kilrush, two stands open green area between Merchant's Quay and Shankyle Road at the location of the proposed trail head.	Two small stands recorded in 2023 but had been treated and was absent in 2024 and 2026.
5	*498879*	*654925*		
6	*489048*	*659616*	Kilkee, on former railway line which meets Gurrane.	3x8m stand.
7	*489494*	*659428*	Kilkee, near Meadow View Court	5m long parallel to route, outside of red line boundary

All of these locations of Japanese Knotweed are within the red line boundary of the proposed development. The construction of the proposed development could cause invasive species to be spread within and outside the site.

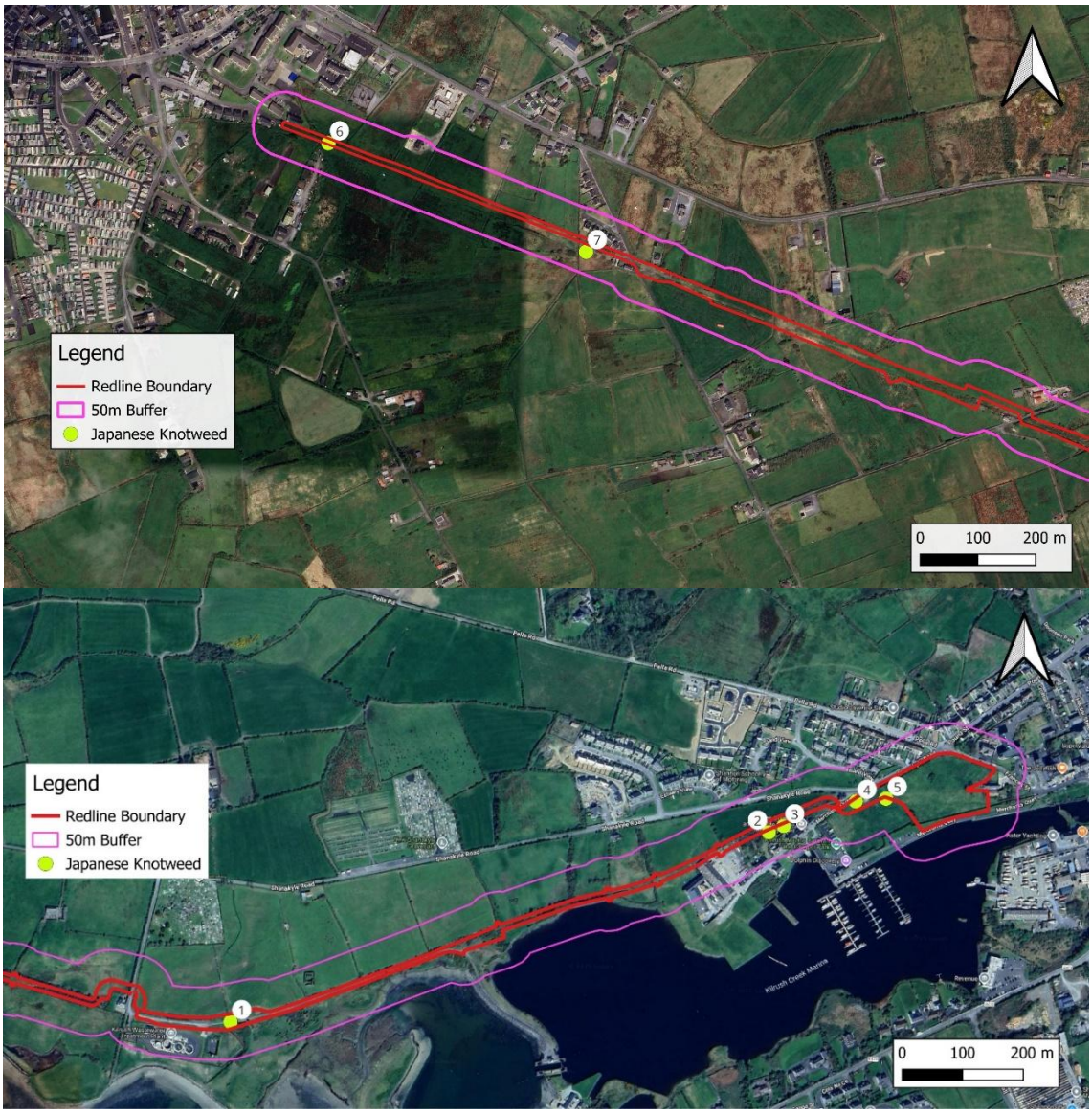

Figure 2-4 **Locations of Japanese Knotweed along the proposed development in Kilkee (top) and Kilrush (bottom)**

2.4.6 Marine Mammals

Desk Study

There are no records in the past 12 months in Co. Clare for marine mammals from the Irish Whale and Dolphin Group portal (Accessed May 2026). NBDC returned records for marine mammals in the last 10 years as presented below in Table 2-14.

Table 2-14: Marine Mammals. Source: NBDC (2025).

Common name	Scientific name
Bottle-nosed Dolphin	*Tursiops truncatus*
Common Dolphin	*Delphinus delphis*
Common Porpoise	*Phocoena phocoena*
Cuvier's Beaked Whale	*Ziphius cavirostris*
Fin Whale	*Balaenoptera physalus*
Grey Seal	*Halichoerus grypus*
Harbour Seal	*Phoca vitulina*
Humpback Whale	*Megaptera novaeangliae*
Killer Whale	*Orcinus orca*
Long-finned Pilot Whale	*Globicephala melas*
Minke Whale	*Balaenoptera acutorostrata*
Striped Dolphin	*Stenella coeruleoalba*

2.5 Potential Effects on the Natural Environment

This section contains a description of the potential effects of the proposed development on the natural environment, in order to provide a contextual background prior the assessment of the adverse effects on the integrity of European sites.

A number of elements of the proposed development are considered likely to give rise to environmental and ecological impacts. The sensitivity of Poulnasherry Bay for wintering birds is a key issue for the project, and for this reason the literature around disturbance to wintering birds is described in detail in Section below. Other potential effects on the natural environment are discussed in Section 2.5.2.

2.5.1 Disturbance to wintering birds

An overview of the current understanding of waterbird disturbance is provided in the following sections.

2.5.1.1 What is a Disturbance Response?

The responses of birds to disturbance are categorised as weak, moderate or high in Lewis & Tierney (2014) and are described as follows:

- Weak response: waterbirds move slightly away from the source of the disturbance.
- Moderate response: waterbirds move away from the source of the disturbance to another part of your subsite; they may return to their original position once the activity ceases.
- High response: waterbirds fly away to areas outside of your subsite and do not return during the current count session.

These categories are useful but they are limited to the one-off response and do not consider the impact of the response. For example, responses alone do not consider the disturbance of a roost, which is a greater impact than the disturbance of birds feeding in open habitat (Lewis et al., 2019; Navedo & Herrera, 2012).

A study of disturbance responses of waterbirds from recreational activities on Bull Island, Dublin, found that a low number of disturbance events caused moderate to high disturbance responses from waterbirds (Lewis et al., 2019).

2.5.1.2 What are the Impacts of Disturbance?

The effects of disturbance and displacement on birds are summarised in Goodship and Furness (2022). Disturbance is the pressure/threat affecting the second highest numbers of wintering waterbird species numbers in Ireland by Burke et al (2025), second only to avian influenza. Disturbance to birds can alter their energy intake (feeding habits), energy expenditure (activity levels), alter their breeding success and ultimately impact their survival. Some of these changes include, but are not limited to, the following:

- Changes to breeding location, timing of breeding, breeding strategy and success
- Changes to foraging location, time spent foraging, food source, energy intake and daily energy budgets;
- Changes to roosting location and time spent at rest; and,
- Changes to migration routes, stop-over locations and seasonal energy expenditure.

The recently published and updated waterbird population estimates and trends for Ireland show that the majority of its wintering waterbird species have declining populations over the previous 23 year period; with the majority of wading bird species in decline over both the short- and long-term periods (Kennedy et al., 2023). The species trends are shown in **Error! Reference source not found.**. Waterbird populations are under pressure from a range of factors, of which anthropogenic disturbance is just one.

2.5.1.3 Sensitivity to Disturbance and Disturbance Distances

There are several variables that can influence the disturbance sensitivity and the disturbance response of birds. The variation in sensitivity to disturbance can be due to interspecific variation (different species vary in sensitivity) and intraspecific variation (individuals of the same species vary in sensitivity), time of year, time of day, tidal state, weather conditions, levels of habituation, the type of disturbance, novelty of disturbance type, specific location and whether disturbance already exists or is absent (Goodship and Furness, 2022).

Similarly, the response to disturbance is also influenced by these variables. The weakest response will usually involve the cessation of normal sleeping, foraging or preening behaviour. The Alert Distance (AD) is the initial response and occurs prior to the FID. The Minimum Approach Distance (MAD) or buffer distance is the minimum distance at which people should be separated from wildlife to avoid any disturbance response (Livezey *et al*., 2016). Guidance on buffer zones are a range of distances that can be used to protect birds from human disturbance is provided by NatureScot (Goodship & Furness, 2022). However, it must be noted that buffer zones are not set distances but should consider the site-specific conditions, conservation status and importance of the population. Also, buffer zones are very difficult to define for specific species for specific sources of disturbance due to the high number of variables. The distance from the source at which birds take flight is the Flight Initiation Distance (FID).

The species tables in Goodship &Furness (2022) were reviewed for the regularly occurring species in Poulnasherry Bay. These are presented below in Table 2-15. In addition, other sources of disturbance distance were reviewed including Mayer et al. (2019) and Cutts et al. (2013) where species were not included in the Goodship & Furness study.

Buffer zones for each species to protect birds from human disturbance, are generalised for all activities and not specific to the types of disturbance which may arise from the proposed development. This assessment follows the precautionary principle and considers the higher buffer distance in the range. The lowest estimates for buffer zones are 100-200m for species of low sensitivity and the highest are 200-650m for species of high sensitivity, such as Curlew. Table 2-15 presents the buffer zones for each species. The table should be read in conjunction with the following notes:

- Mayer et al., (2019) reports Flight Initiation Distances (FID, the distance at which birds flee from an approaching threat) is often used to measure antipredator behaviour and establish buffer zones to reduce human impact on wildlife. This study found FIDs by approaching birds on a body of water using a boat, and therefore the land-based activities of the proposed development may have different FIDs.
- Cutts et al (2013) provides estimates for distances where mitigation would be required to avoid causing disturbance to various species, primarily from construction works.
- Laursen et al. 2005, assesses Escape Distance (ED) of waterbirds is defined as the shortest distance at which birds flush when a person or another disturbing stimulus approaches. EDs have been used to demonstrate relative susceptibility of waterbirds to different types of disturbance, e.g. the differences between a walking person, a car or a boat.

Table 2-15: Qualifying Interest Species Sensitivity to Disturbance

Common Name	Sensitivity	Buffer zone/ Disturbance distance	Source
Cormorant (Phalacrocorax carbo) [A017]	Moderate	152m (flight initiation distance)	Mayer (2019)
Whooper Swan (Cygnus cygnus) [A038] (species not recorded during any survey in Poulnasherry Bay)	Moderate	200-600m	Goodship & Furness (2022)
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	High	400m	Cutts et al. (2013)
Shelduck (*Tadorna tadorna*) [A048]	High	100-400m	Goodship & Furness (2022)
Wigeon (*Anas penelope*) [A050]	High	200-500m	Goodship & Furness (2022)*source quality considered low
Teal (*Anas crecca*) [A052]	High	168m (flight initiation distance)	Mayer (2019)
Pintail (*Anas acuta*) [A054]	Moderate	100-200m	Goodship & Furness (2022) *source quality considered low
Shoveler (*Anas clypeata*) [A056]	Moderate	100-200m	Goodship & Furness (2022)

Common Name	Sensitivity	Buffer zone/ Disturbance distance	Source
Scaup (*Aythya marila*) [A062] (species not recorded during any survey in Poulnasherry Bay)	High	150-450m	Goodship & Furness (2022)
Ringed Plover (*Charadrius hiaticula*) [A137]	High	100-300m	Goodship & Furness (2022)
Golden Plover (*Pluvialis apricaria*) [A140]	Moderate	300m	Cutts et al. (2013)
Grey Plover (*Pluvialis squatarola*) [A141]	Moderate	150-300m	Goodship & Furness (2022)
Lapwing (*Vanellus vanellus*) [A142]	Moderate	200-500m	Goodship & Furness (2022)
Knot (*Calidris canutus*) [A143]	Moderate	100-300m	Goodship & Furness (2022)
Dunlin (*Calidris alpina*) [A149]	Moderate	150-300m	Goodship & Furness (2022)
Black-tailed Godwit (*Limosa limosa*) [A156]	Moderate	100-200m	Goodship & Furness (2022)
Bar-tailed Godwit (*Limosa lapponica*) [A157]	Moderate	200-300m	Goodship & Furness (2022)
Curlew (*Numenius arquata*) [A160]	High	200-650m	Goodship & Furness (2022)
Redshank (*Tringa totanus*) [A162]	Moderate	200-300m	Goodship & Furness (2022)
Greenshank (*Tringa nebularia*) [A164]	High/ Moderate	300-500m	Goodship and Furness, 2022
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	Unknown	50-450m	Laursen et al. (2005)

2.5.2 Construction Phase Disturbance

Construction of the proposed development will result in noise, vibration, lighting and increased human activity along the length of the route. The working hours for construction will be between 07:00 – 19:00, Monday – Friday and Saturday 08:00 to 16:30. No working will be permitted on Sunday and Bank Holidays. The construction period will be up to 24 months for the entire proposed development, however, any single area will be subjected to disturbance for much shorter duration.

The construction of the proposed development has the potential to cause disturbance to birds, particularly around Poulnasherry Bay. However, as set out later in Section 5 Mitigation; construction phase disturbance to wintering birds will be avoided as construction within sensitive bird areas will not be permitted from October to March in the sensitive bird areas. Construction in these sections will only be undertaken during the summer months (April – September inclusive), thereby avoid impacting on wintering birds. For this reason, a detailed assessment of construction phase disturbance impacts on wintering birds is not provided.

2.5.3 Operational Phase Disturbance

2.5.3.1 Disturbance to Wintering Birds from the Proposed development

The operation of the proposed development has the potential to cause disturbance to birds, in particular in the sensitive bird areas (presented in Figure 2-3 and described in Section 2.4.3.1). This section presents the potential sources of disturbance and disturbance impacts which are specific to the operational phase of the proposed development.

Greenway users including people and dogs have the potential to cause disturbance through their visible presence and by producing noise on the greenway itself, or by accessing wintering bird habitat outside of the greenway. Given the close proximity of the greenway to Poulnasherry Bay, the users of the greenway could cause disturbance to waterbirds in the intertidal area. The locations which are currently open to the public, including Brew's Bridge, Carrowncalla South and the local roads which lead from the N67 to the coast, will remain open to the public during the operation of the proposed development.

All areas of the SPA are important, regardless of how frequently birds or how many birds were recorded during the surveys. The locations along the proposed development route where disturbance to wintering birds is most likely to occur are those areas which are visible or partially visible from the intertidal areas. These 'sensitive bird areas' have been identified as part of this assessment and are presented in Figure 2-3 and Appendix E, and are described in Section 2.4.3.1. Moyasta Bridge is a particularly sensitive location due to the intertidal habitat present on both sides of the route, and the fact that the bridge and causeways are elevated and exposed.

Most of the route of the proposed development is undeveloped and relatively undisturbed. The existing sources of disturbance are associated with private dwellings and farms located in proximity to the shoreline. People in gardens, traffic, agricultural machinery, livestock, and intertidal aquaculture are all causes of disturbance to wintering birds, however, these are low levels and occasional in Poulnasherry Bay. There are several exceptions where the levels of human presence is high, including at Kilrush Marina, Brew's Bridge Beach and Blackweir Bridge. It is expected that birds in these areas have a higher tolerance to the presence of people than birds elsewhere.

2.5.3.2 Greenway Visitor Number Estimates

The predicted number of greenway users is described in Chapter 5 of this EIAR. A central, low and high growth scenario was calculated for both pedestrians and cyclists, Table 2-16 below presents scenario numbers for year one of the greenway.

Table 2-16 Predicted Greenway User Estimates

Low growth scenario	Central growth scenario	High growth scenario
605 / day	807 / day	1,009 / day
220,825 / year	294,555 / year	368,285 / year

In the low growth scenario, the number of visitors based on an even spread across the year and a 9-hour daylight day is 67 visitors per hour.

The main risk associated with greenway visitors is disturbance to wintering birds, therefore the following paragraphs deal with greenway visitors from October to March inclusive.

The average number of greenway user calculated based on winter counts from the 1st to the 7th of December 2025 on the Great Western Greenway, the Waterford Greenway, the Carlingford Lough Greenway, the Old Rail Trail, the South East Greenway and the Limerick Greenway is 430 visitors.

The populations in the three areas of the proposed development, Kilkee, the rural areas, and Kilrush are based on CSO census data from April, 2022. The number of tourists present has been extrapolated from the Clare County Development Plan in the case of Kilkee, and the estimated numbers of tourist beds available in Kilrush and the rural areas.

Table 2-17 presents the local winter populations at Kilkee, the rural areas, and Kilrush and the expected number of greenway visitors originating from each of these locations.

Table 2-16: Population estimates surrounding the proposed development

	Kilkee	Kilrush	Rural Areas	Total
Permanent Residents (Census 3rd April 2022)	1214	2649	1106	4969
Tourist estimates (October-March)	25[19]	19[20]	19[21]	63
Total population	1239	2668	1125	**5032**
% of total	25%	53%	22%	**100%**
Numbers of visitors per day based on 430/day	107	228	95	**430**

Table 2-17 shows that the daily number of visitors to the greenway between October and March is 430 people, with 107 people accessing the greenway from Kilkee, 95 from Moyasta and 228 from Kilrush. Based on this data, the potential for greenway users to reach the sensitive bird areas can be considered.

Publicly available data from the TII MOVE shows that 75% of people spend less than 90 minutes on greenways. Table 2-18 presents the speed of each mode of transport and the distance that can be covered in 90 minutes.

Table 2-17: Modes of Transport on Greenway and Proportion of Users

Mode	Speed	Distance travelled in 45 minutes before turning back	Percentage of users engaging in each activity	Number of total daily users (n=430)
Walking	5 kmph	3.75 km	57 %	245
Cycling	17 kmph	12.75 km	36 %	154
Jogging	10 kmph	7.5 km	7 %	31

[19] The summer population of Kilkee is 10-15,000 (Clare CDP).
[20] There are approximately 150 visitor beds in Kilrush. The assumption was made each bed was a double and the winter occupancy rate is 5%. This is 15 people per night. A 25% was added to this figure to account for a margin of error.
[21] The same number was applied to the Rural areas and Moyasta. An accommodation search revealed that the real number is likely to be much lower.

Table 2-19 presents the number of greenway user who would reach 'Sensitive Bird Area 1' which is 5km east of Kilkee.

Table 2-18: Proportion of Users Reaching a Sensitive Bird Area, starting in Kilkee

Mode	Speed	Distance travelled for 45 mins before turning back	How long would it take to reach Sensitive Bird Area 1?
Walking	5kmph	3.75km	60 mins (120 mins return)
Cycling	17kmph	12.75km	18 mins (36 mins return)
Jogging	10kmph	7.5km	30 mins (60 mins return)

Walkers who remain on the greenway for at least two hours would reach Sensitive Bird Area 1. Given the average dwell time of 75 minutes on Greenway, it is expected that only a small percentage of walkers would reach Sensitive Bird Area 1. It is reasonable to assume that a high proportion of cyclists originating in Kilkee would reach Sensitive Bird Area 1. For joggers, the speed and time spent is very variable, however 60 minutes at 10kmph is considered at the upper end of the time and distance for recreational runners.

The access point at Moyasta is adjacent to Sensitive Birds Areas in both directions. All visitors accessing the greenway at this point are assumed to reach a Sensitive Bird Area.

From Kilrush, 'Sensitive Bird Area 9' is 400m west of the proposed trailhead. It is reasonable to assume that all greenway visitors would reach this area. This sensitive bird area is within Kilrush Harbour and is not influenced by the tide. The greenway would travel along the coast, where small numbers of birds were recorded. Travelling west 'Sensitive Bird Area 8' is 3.5km west of Kilrush at Carrowncalla South. Only visitors doing a round trip of over 7km would reach this point. This is assumed to be mainly cyclists.

The conclusions of this greenway user prediction exercise are:

1. The figure of 430 visitors per day equates to 3 people per kilometre per hour, based on 9.5 hours of daylight and the total greenway length of 15km. It is expected that greenway visitors will generally be concentrated around the trail heads at Kilkee, Moyasta and Kilrush.
2. The majority of daily greenway users will originate in Kilrush. This is due to the higher baseline population in the winter.
3. A majority of visitors originating in Kilkee will not reach a sensitive bird area.
4. Visitors entering Kilrush will get to the sensitive bird area within Kilrush Harbour, 400m west of the trail head. This area does not have any intertidal habitat. Cyclists and joggers could reach Brew's Bridge in one hour or less. This area is open to the public already.
5. TII move data shows that 8.6% of greenway visitors are dog walkers. This translates to 37 dog walkers per day across the entire greenway during the winter months, which again, will be concentrated around the trail heads.

6. The dwell times are based on TII MOVE data and visitor behaviour trends on greenways around Ireland and do not reflect the fact that the individual dwell times walkers, joggers and cyclists are highly variable.
7. Mitigation is required to reduce the potential for disturbance in all sensitive bird areas, and this is addressed in the Mitigation Section.

2.5.3.3 Visual disturbance

Section 2.5.1.3 (sensitivity to disturbance) shows that birds can be disturbed up to 600m away from a perceived threat. This is relevant in open habitats, such as intertidal areas, where birds can see over a wide area. Human activity inland generally does not cause disturbance as it is not seen by birds or birds do not perceive it as a threat, as a person is typically behind a hedgerow or wall. Cutts et al. (2013) states that even construction works can be considered low level disturbance if it occurs out of sight of the birds, such as behind a flood embankment but only a short distance from the intertidal area. However, if a person were to suddenly appear on top of the flood bank, this can cause a high disturbance reaction.

In order for disturbance to occur, there must be either a temporal and spatial overlap between the birds and greenway users (Goss-Custard et al., 2019), i.e. birds and people need to be present in the same area at the same time. Greenway users would have an average daylight period of 9.5 hours between October and March. The locations of the birds will also change throughout the tidal cycle. As the tide recedes, feeding waders will often follow the tide to obtain more profitable prey or reach safer feeding areas (Cresswell, 1994).

Birds will be closest to the greenway during the high tide window, which is a four hour period comprising the two hours either side of high tide. There are two high tides in every 24 hour period, so on average, there will be one high tide per day during daylight hours. This is the period when disturbance is most likely to occur, as there is a peak in human activity and birds are pushed closer to the shore.

A total of 4.9km of the greenway is within a sensitive bird area. The total length of the greenway is 15.2km, therefore, 32% of greenway is in a sensitive bird area. This is a conservative assessment and slightly overstates the true figure as some of the sensitive bird area's contain partial screening from vegetation or are far inland so they are not fully visible to waterbirds. This is similar to the level of exposure in a study in the Exe Estuary (Goss-Custard, 2019a) where 35% of a 16.5km route was in direct line of sight of waterbirds. The Exe Estuary Trail follows the Exe Estuary in southwest England, from Dawlish to Exmouth, passing through the villages of Starcross, Topsham and Lympstone. The mid-point of the trail is the city of Exeter, with a population of 130,709 in the 2021 census. One third of this trail is within direct line of sight of waterbirds and has no barriers to prevent access to the shore, and people walking on the mudflats is so common it is considered one of the main sources of disturbance, rather than people walking on the trail itself. This study examined whether disturbance by people caused a significant effect on waterbirds and found that disturbance reduced daily foraging time by <1% in a tidal cycle and <0.05% in a 24hr period. It was concluded that such small amounts of lost foraging time and increased energy expenditure would not impact their survival.

Not all visual stimuli result in disturbance responses from birds and birds quickly become habituated to various levels of stimulus. Whilst habituation to human activity is widely known to occur (Nairn, 2005), this has not been considered in this assessment to lower the potential disturbance response, but it remains important to real-world scenarios. In the Exe Estuary, Goss-Custard, et al., (2020) stated that trains passing in close proximity to roosting waterbirds generally do not cause disturbance (Plate 1) and low-flying aircraft do not cause disturbance. This study demonstrated that disturbance was caused to waterbirds shortly after the trail was built however it reduced to almost no disturbance over time (Plate 2 shows the setting). There is also abundant anecdotal evidence from Bull Island, Co. Dublin, that waterbirds habituate to

people walking, running and walking with dogs on the promenade even at high tide when birds are roosting. Phalan and Nairn (2007) note that waterbirds in Dublin Bay become accustomed to people and dogs walking along paths in a predictable way and do not show disturbance responses.

Plate 1: Train passing the Exe Estuary. Source: Goss-Custard et al., 2020. The trains are frequent and pass immediately adjacent to roosting waterbirds (which can be seen in the foreground).

Plate 2: The 'Goat Walk' on the Exe estuary. Source: Goss-Custard et al., 2020. There is no screening, the distance from the trail to the edge of the mudflats is 30-35m, where a high level of habituation has occurred and there is low-level disturbance, despite the lack of screening.

There are no studies which show the before and after effects of installation of visual screening around a wetland site or monitoring of human disturbance when management measures have been implemented. The lack of direct studies is likely due to acceptance that birds are not disturbed when they are unaware of the presence of people. This is demonstrated through bird hides, which are used around the world to allow people to view birds in their natural habitats without disturbing them. These rely on the concept that when the birds can't see or

hear people, they are not disturbed. A study on bird disturbance (Pease et al, 2005) noted that people in hides did not disturb birds nearby, and that where vegetation, embankments or screen were used to screen the hide access paths, birds were similarly not affected by the presence of people.

The effectiveness of visual screening is described in the waterbird disturbance mitigation toolkit (Cutts et al., 2013), which states that a person working behind a flood defence berm does not cause disturbance, but when this person stands on top of the berm and appears in the bird's view, the birds will likely show a disturbance response. In a 10-year study in the Exe Estuary, only areas which were visible to birds were considered in the disturbance assessment. Existing features which concealed people from birds such as behind embankments, hedges, trees, or buildings) were not considered to have a spatial overlap with birds, as without this spatial overlap there is no possibility for disturbance (Goss-Custard et al., 2019). Another study investigating the costs of human disturbance to wintering birds actively measured this by intentionally approaching birds on mudflats and record their responses (Collop et al., 2016).

It is generally accepted that a high level of disturbance responses can cause population-level impacts through lower fitness leading to lower survival rates and reduced reproductive success. However, very little is known about what level of disturbance can result in significant cost to birds. The point where the level of disturbance begins to affect bird demographic rates is known as the 'disturbance threshold' (Goss-Custard and Stillman, 2020). This threshold must be exceeded for significant impacts to occur to a population (Goss-Custard et al., 2019). Goss-Custard et al., (2019) provides a method for quantifying the cost of disturbance. The assessment methodology was developed for a walkway adjacent to an SPA which is applicable to Poulnasherry Bay. Figure 2-2 shows the pathway and variables for significant disturbance to occur to waterbirds. For the proposed greenway, the predicted level of each variable is presented in Table .

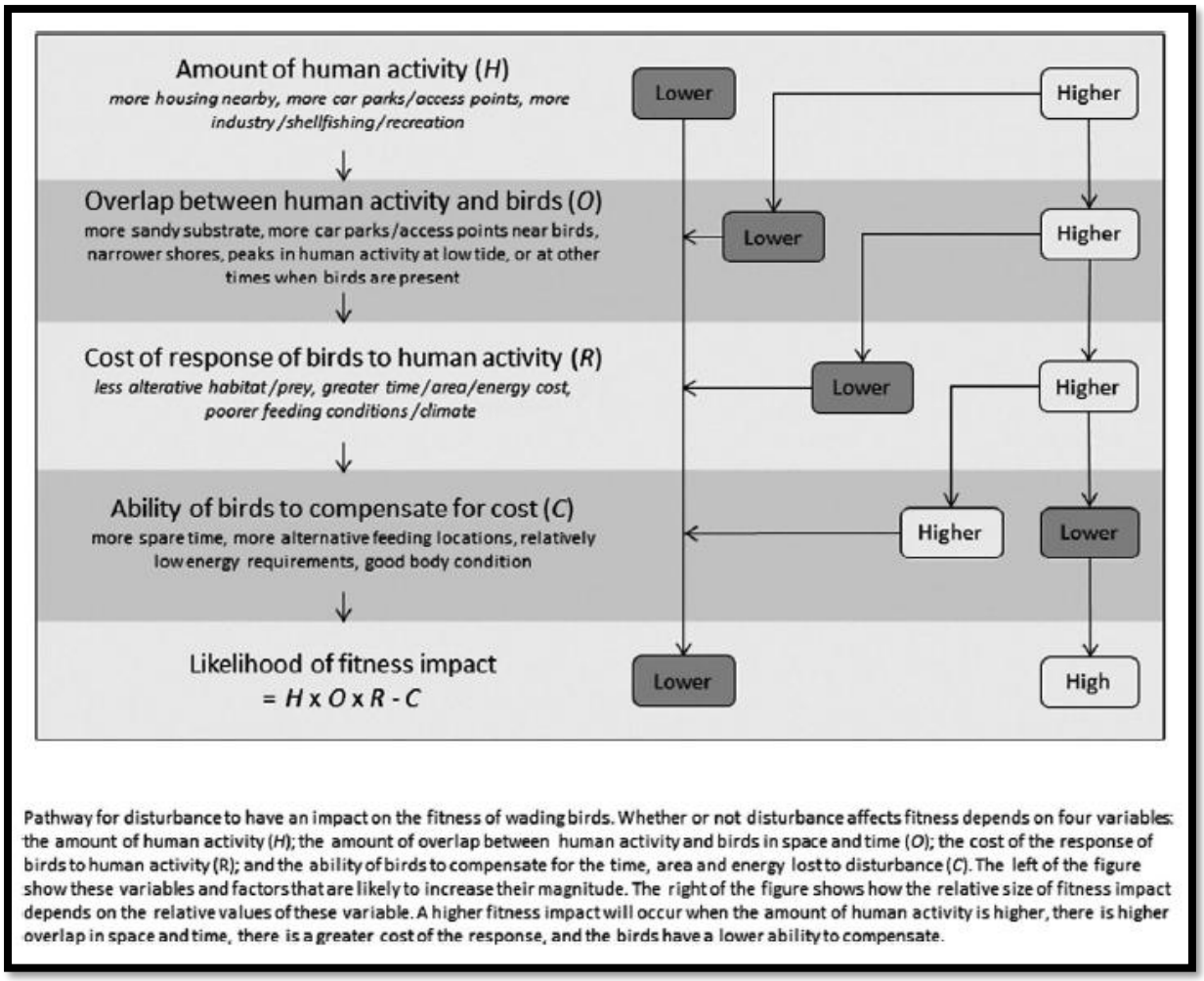

Figure 2-2: Pathway for disturbance to have an impact on wading birds. Extract from Goss-Custard et al., 2019.

Table 2-20 Pathway for disturbance impacts. Application and assessment of the proposed development.

Variable	Predicted level of variable for proposed development	Reasoning
H variable Amount of human activity	The number of expected users is expected to be <u>low</u> in the winter months	The amount of human activity will be low due to small local populations, low numbers of visitors in winter, small percentage who engage in walking / cycling, and poor weather in winter deterring outdoor activities. On average, 48 people per hour will be present on the greenway in winter, however these people will be spread across the greenway (c.15km) and not all will reach a sensitive bird area (see Section 2.5.3.2).
O variable Overlap between human	The amount of overlap between people and birds is expected to be <u>low</u> in the winter months	<u>Very low spatial overlap:</u> Other than areas where there is existing public access to the foreshore, the greenway will be fenced off. People will not be visible due to screening, and sound will attenuate to background levels within 20m. Surveys for the proposed development recorded 315 no.

activity and birds	due to both low temporal and spatial overlap	birds within 20m of the proposed development over 19 months of winter surveys (<1% of all birds recorded). A total of 4.9km of the greenway is in a sensitive bird area, however the rest of the greenway is not in close proximity to the shoreline and the Shannon Fergus Estuary SPA contains >200km of coastline. Low temporal overlap: during the high-tide period, birds are pushed into the 20m zone of the sensitive bird areas, there is an average of 9.5 hours of daily light over the winter (and therefore maximum one high tide period will occur during daylight hours in the winter). People will be present on the greenway during daylight hours and the peak of human activity is during the middle of the day. There is approximately a 4-hour window (two hours either side of high tide) each 24 hrs where birds will be pushed closer to the greenway and where people are likely to be present at the same time. This tidal window will some overlap with the peak of human activity max 14 days per month, but this includes all overlap periods, even 5/10mins. There are about 9 days per month where these two periods overlap by at least two hours. The greenway will have almost no users during the hours of darkness, as waterbirds also forage at night and there is no risk of disturbance during the hours of darkness.
R variable Cost of response of birds to human activity	Predicted to be low	Based on the findings of Goss-Custard et al., (2019) which calculated that time costs from disturbance flights were equivalent to <0.1% of the available daylight foraging time of 9 h per tidal cycle and < 0.05% of the foraging time in a 24hr period. Energy costs were equally small, being equivalent to only 0.02% of the daily energy requirements of an individual bird These amounts of disturbance time, energy costs and thus fitness cost were described as 'trivial'. Collop et al (2016) also concluded that certain species can experience a 5-10% reduction in feeding time before they may be significantly affected. The bird densities of the Shannon Fergus Estuary SPA are much lower than the Exe Estuary SPA (see below). It follows that the disturbance costs would be even lower in the Shannon Fergus Estuary SPA as fewer birds will be disturbed and there is more alternative foraging habitat available (due to lower bird densities), and therefore more likely to be able to compensate for lost foraging time/increased energy demands. Such small amounts of lost foraging time/increased energy demands are most unlikely to affect winter mortality or spring migration (Goss-Custard et al., 2019). **Site bird densities** The Exe Estuary SPA is 23.5km^2 in area with 9.4km^2 of intertidal habitat, whilst the Shannon Fergus Estuary SPA has an area of 322.41km^2 of wetland habitat and 90km^2 of intertidal habitat (NPWS, 2012d). Per km^2 of intertidal habitat the Exe Estuary holds much higher densities of the QI species which are common between the two sites, using baseline populations for both sites. Even when total

		population of all QI species are assessed, the Exe Estuary still has higher bird density in intertidal habitats. Light-bellied Brent Goose: 97% higher density Grey Plover: 88% higher density Dunlin: 76% higher density Black-tailed Godwit: 62% higher density All QI species: 34% higher density
C variable Ability of birds to compensate for cost.	Predicted to be higher	The birds in the Shannon Fergus Estuary SPA are at a lower density in the tidal habitats than the Exe Estuary, therefore there is a greater area for birds to forage to compensate for increased energy costs.
Likelihood of fitness impact =H x O x R - C	Predicted to be low: H (low) x O (low) x R (low) – C (high) = low likelihood of fitness impact Human activity (low) x Overlap (low) x Cost of Response (low) x Compensation (high) = low likelihood of fitness impact	Based on the findings of Goss-Custard et al., (2019), which had a similar setting, but higher H and O variables: a walking trail of similar length, with similar percentage of trail exposed to waders (c. 33%), but closer to a much larger population centre (>150,000 people), and therefore more people using the trail (and greater potential for disturbance events), a smaller estuary (greater density of people across the estuary), and had greater spatial overlap due to the intertidal area being accessible to people, and lacked screening or fencing and had greater bird densities in the intertidal habitats. This study found that the cost of disturbance events to birds in this system was of 'trivial significance'. Given this finding and the much lower probability of disturbance occurring from the proposed development, and the highly precautionary approach taken, the likelihood of a fitness impact to QI species of the Shannon Fergus Estuary SPA is also low.

Limitations and considerations of the above comparison:

- This study did not assess the disturbance impact of several QI species of the Shannon Fergus Estuary SPA which are not present in the Exe SPA, and the study focussed on waders but not wildfowl. The QI species of the Shannon Fergus Estuary SPA not assessed in the study are Cormorant, Whooper Swan, Brent Goose, Shelduck, Wigeon, Teal, Shoveler, Scaup, Golden Plover, Lapwing and Black-headed gull.
- Some of these species have high sensitivity to disturbance and therefore could have higher response rate and therefore higher R variable (cost of response to human activity). However, several species with high sensitivity to disturbance, most notably Curlew which has the highest estimates for disturbance buffers, was assessed in detail and the likelihood of fitness impact was also found to be low.
- There may be a higher level of habituation in the Exe Estuary than in Poulnasherry Bay, and therefore there may be relatively higher disturbance responses in Poulnasherry Bay than was recorded in the Exe Estuary, due to lower levels of habituation. The study in the Exe Estuary was carried out over 10 years, during which time a level of habituation is likely to have occurred.
- Other parts of the Shannon Fergus Estuary SPA may also have high frequency of disturbance which could act in combination to increase the overall level of disturbance in the SPA – likely areas include Shannon Town, Limerick City, Foynes Port and Aughinish Alumina aluminium refinery, Tarbert, and some small settlements along the coastline. The level of disturbance across the SPA is not known, however the vast majority of land bordering the shoreline is agricultural, not accessible to the public and

therefore has negligible levels of baseline disturbance. Therefore, the vast majority of the SPA is disturbance free.

Despite these limitations for the comparison and assessment of the costs impact to birds in the Shannon Fergus Estuary SPA from the proposed development are reliable and precautionary. A similar precautionary approach was taken by Goss-Custard et al., (2019) to estimate the time and energy costs. It was estimated that 43 times more disturbance would need to occur before the disturbance threshold was reached, which is also considered to be a low estimate. Millions of people visit the Exe Estuary yearly (Liley et al. 2014) and the estimate of disturbance is considered to be high compared to other SPAs (Stillman et al., 2012). Over time, birds will become habituated to people using the greenway and it is likely any disturbance response will decrease. Therefore, a long-term decline in population demographics is more unlikely when habituation is considered.

2.5.3.4 Dogs off lead / on lead

Dogs can have a disproportionate level of disturbance to roosting and foraging birds (Gómez-Serrano, 2021; Phalan & Nairn, 2007). Dogs may elicit a stronger disturbance response in birds compared to humans walking given that they are perceived as a greater threat, can be more wide-roaming (if unrestrained) and can move unpredictably (Weston and Stankowich, 2014). Dogs will generally follow the route of their owner; however, they will also roam rapidly into surrounding areas and have the potential to cause disturbance to a greater area (Thomas et al., 2024). This disturbance caused by dogs can have negative effects on birds (Steven et al., 2011). Unrestrained dogs (running off-lead) with access to intertidal areas have been recorded as the most prevalent source of disturbance to wintering waterbirds at some sites (Lewis et al., 2019, Adcock et al 2018, Nairn, 2007). However, in high disturbance areas such as Dublin Bay, waterbirds can become habituated to dogs moving predictably along paths, and cause little disturbance (Nairn, 2007), as these are not perceived as a threat by the birds. People and dogs do not necessarily cause disturbance to waterbirds and the vast majority of recreational users (even with dogs) do not cause disturbance (Nairn, 2007). Dogs off lead rapidly approaching high tide roosts or entering waterbodies are a clear source of disturbance (Gómez-Serrano, 2021). Most greenway users with dogs are likely to be local users rather than tourists, and dog owners will take their dogs on walks throughout the year. Therefore, dogs are likely to be present year-round along the proposed development.

2.5.3.5 Noise disturbance from greenway visitors

Cutts et al. (2013) focusses on disturbance from construction works for both visual and aural stimuli. Aural stimuli can have different effects depending on whether they are constant or sudden, for example a sudden noise >60dB (at the bird, not the source) could result in a high-level disturbance response, whilst a prolonged vibratory piling at 80dB would have a lower level of reaction. Aural stimuli can also differ in effect depending on whether they are in combination with visual stimuli or solely noise, with aural only stimuli eliciting a lower-level response.

Visitors to the Greenway will be a source of noise during operation. This includes people talking, shouting, and dogs barking. Loud or sudden noises can be a source of disturbance for waterbirds if above a particular threshold. This section considers disturbance effects from noise. The average noise levels for typical greenway users (taken from decibelpro.app) are as follows:

- People talking normally: 55 – 65 decibels (dB),
- People shouting: up to 85dB.
- The sound of a children's playground: approximately 80dB.

- A dog barking: up to 90-100dB (Sales et al, 1997).

The ambient noise levels along the route of the proposed development ranges from 36-56dB in quiet areas, and 56-71dB in busier areas (EIAR Chapter 14, Noise and Vibration). Noise attenuates with distance, with a reduction of 6dB per doubling of distance in air.

The noise from dogs barking was shown to increase vigilance in coot (Randler, 2006), however there is very little evidence to show that the sound of dog barking alone can cause significant disturbance effects to water birds when the dog is not visible and cannot access the area where there birds are. It is well documented that unleashed dogs accessing intertidal areas will cause significant disturbance (Weston & Stankowich 2014; Lafferty, 2001).

Cutts et al., (2013) provides guidance on the attenuation rate of noise from source to receptor, where the noise is construction plant/machinery and the receptor is the bird. As per the extract below (Figure 2-5) from Cutts et al., (2013), a sound level of 70 dB at the receptor is considered an acceptable noise level for wintering waterbirds, i.e. below the threshold for disturbance. Therefore, where a source is producing a higher level of noise but is at a distance from the bird, the noise is likely to only cause a disturbance response where the noise is still higher than the threshold level when it reaches the bird. The disturbance levels and threshold levels as per Cutts et al., (2013) are as follows:

- Acceptable noise levels are shaded green with dark green (<55dB) unlikely to have any disturbance effect, whilst the pale green might occasionally induce a low-level behavioural response such as a heads-up (55-69dB).
- Yellow to orange shading is where a response is likely but mitigation may be effective in reducing the disturbance risk (70-79dB)
- Pale red where mitigation is necessary and might be of value, but with a remaining risk of effect (80-85dB); dark red where a flight response is almost certain to occur and would be increasingly difficult to mitigate through simple screening etc and may require the cessation of works during high sensitivity periods (86-120+dB).

Metres from Source	dB(A)										
0.67	120	110	100	95	90	85	80	75	70	65	60
1.33	114	104	94	89	84	79	74	69	64	59	54
2.67	108	98	88	83	78	73	68	63	58	53	48
5.33	102	92	82	77	72	67	62	57	52	47	42
10.67	96	86	76	71	66	61	56	51	46	41	36
20.67	90	80	70	65	60	55	50	45	40	35	30
42.67	84	74	64	59	54	49	44	39	34	29	24
85.33	78	68	58	53	48	43	38	33	28	23	
170.67	72	62	52	47	42	37	32	27	22		
341.33	66	56	46	41	36	31	26	21			
682.66	60	50	40	35	30	25	20				
1365.32	54	44	34	49	24						

Figure 2-5: Extract from Cutts et al (2013), Waterbird mitigation toolkit. Noise levels, distance and disturbance thresholds.

The various sound levels from greenway users as outlined above are presented below in Table 2-, using the distances and categories from Cutts et al., (2013). As shown below, a normal conversation is below the disturbance threshold of 70dB at the source, therefore, at any distance this is unlikely to cause any response. A normal decibel level is assumed for conversations due to the low level ambient noise of the greenway surroundings i.e. people will not need to speak loudly to be heard as it is a quiet environment. A person shouting at 85dB, reduces to below 70 dB at 5.33m. A children's playground at 80dB reduces to below 70 dB at 2.67m. A dog barking at 100dB reduces to below 70 dB at 20.67m.

Over the course of the wintering bird surveys for the proposed development between 2021 and 2026, a total of 315 birds were recorded within the 20m buffer. This accounts for <1% of all the birds recorded on the wintering bird surveys between 2021 and 2026. The vast majority of these records were of single birds or groups of <10 and includes non-Qualifying Interest species. The highest records were one group of 52 Lapwing in 2021, groups of 42 and 37 Curlew spread out over mudflats in 2026, a group of 37 Wigeon in 2026, a group of 32 Black-Headed Gull in 2021 and a group of 17 Curlew in 2022. Therefore, 99% of birds occur at a distance beyond the area which could be impacted by noise above background levels. 96.7% of birds were beyond 100m distance from the proposed development and will not experience any level of noise disturbance whatsoever.

Table 2-21 Application of the Waterbird Mitigation Toolkit for assessment of noise disturbance on waterbirds.

	Noise at source (dB)			
Distance from source (m)	**Normal conversation**	**Children (playground)**	**Person shouting**	**Dog barking**
0.67	60	80	85	100
1.33	54	74	79	94
2.67	48	68	73	88
5.33	42	62	67	82
10.67	Reduces to background levels of 36dB	56	61	76
20.67		51	55	70
42.67		45	49	64
83.33		39	43	58
170.67		Reduces to background levels of <36dB	37	52
314.33			Reduces to background levels of <36dB	46
682.67				40
1365.32				Reduces to background levels of <36dB

2.5.3.6 Potential Effects on the Shannon and Fergus Estuary SPA

The I-WeBS Trends Report 1994/95 to 2019/20 (Kennedy et al., 2023) presents the populations trends of a range of waterbirds at 97 sites around Ireland. Site-specific trends for the Shannon Estuary or Poulnasherry Bay are not included in the report, therefore the national trends were used to assess the population trends for the species present at the site. Long-term population trends for these species show that four of the species recorded and in large decline, two are in moderate decline, 10 are in intermediate decline, and 10 are stable or increasing. No national trend was available for Qualifying Interest Black-headed Gull (a Qualifying Interest species of the SPA), or any other gull species. Of those species recorded in large decline, Golden Plover, Grey Plover and Lapwing were recorded in the study area in numbers exceeding 1% of the SPA population, these species and others which exceeded 1% SPA thresholds are indicated in bold text in Table 2-22. Site-specific bird population trends are not available for the Shannon and Fergus Estuary. For the purposes of the assessment, a precautionary approach has been adopted, whereby each species recorded during the surveys is assumed to be part of a site-level declining population.

Given the significant numbers of these species surrounding the proposed development, their sensitivity to disturbance and long-term national population declines, there is potential for the proposed development, in the absence of mitigation, to adversely affect the population and distribution of the Qualifying Interests.

Table 2-22 IWeBS National Trends Report for Qualifying Interest and regularly occurring species of Poulnasherry Bay (percentage change). Species in bold are those which were recorded in the study area in numbers exceeding 1% of the SPA baseline population.

Common Name	National - 5 Year	National - 12 Year	National - 23 Year	Long-term Trend
Scaup	-33.6	-82.9	-89.2	*Large Decline*
Lapwing	-6.5	-45.1	-63.9	
Grey Plover	-21.9	-42.8	-58.8	
Golden Plover	-17.5	-58	-54.1	
Dunlin	5.9	-21.2	-45.2	*Moderate Decline*
Curlew	-9.4	-23.7	-43.1	
Turnstone	-33.6	-46	-23.7	*Intermediate Decline*
Mallard	-11.3	-19.7	-19.1	
Wigeon	0.9	-17	-18.2	
Red-breasted Merganser	-12.9	5.2	-14.7	
Pintail	-0.8	-6	-13.7	
Great Crested Grebe	-39.5	-6.1	-10.8	
Shoveler	23	-21.3	-10.8	
Knot	0	-12.2	-9.8	
Bar-tailed Godwit	-32.6	-13.9	-5.1	
Ringed Plover	-4.3	-26.8	-1.1	
Grey Heron	1	-4.9	6.6	*Stable or increasing*
Redshank	-14	-28.4	6.7	
Shelduck	6.3	-0.8	9.3	
Oystercatcher	-17.5	-31.1	10.8	
Teal	1.8	5.7	19.4	
Greenshank	0.9	7.3	41	
Cormorant	38.5	8.4	42.9	
Black-tailed Godwit	22.5	25	92.3	
Light-bellied Brent Goose	-11.2	1.2	93.3	
Little Egret	34.6	61.5	483.3	

As described in Section 2.4.3.1, at Moyasta - Sensitive Bird Area No.4, the proposed development is particularly at risk of causing disturbance to wintering birds as the railway line crosses the tidal estuary at this location. The railway line is elevated above the mudflats, lacks any existing screening and users would be visible to waterbirds in the adjacent habitats, and likely cause disturbance to birds in the surrounding environment. Large numbers of wintering birds were recorded in the surrounding mudflats, including nationally important numbers (>1% of the national population) of Pintail and Wigeon. Relatively high numbers of other Qualifying Interest species were recorded here during at least one survey. The peak counts correspond to 42% of the SPA population of Pintail, 15% for Wigeon, 11.5% for Greenshank and 10.7% for Teal. The following species were recorded in numbers between 1-10% of the SPA population: Bar-tailed Godwit, Brent Goose, Cormorant, Curlew, Golden Plover, Redshank, Shelduck and Shoveler. Pintail, Wigeon, Teal and Greenshank were regularly recorded in significant numbers within 500m of Moyasta Bridge (>50% of surveys). Pintail and Wigeon both have nationally 'intermediate declining' populations, whilst Teal and Greenshank have stable or increasing populations. Pintail have moderate sensitivity to disturbance and Wigeon have high sensitivity (Goodship & Furness, 2022).

The population trends for waterbird species in Ireland are outlined above in Table 2-22. The declines are a result of a number of factors, including habitat loss, agricultural intensification, climate change, pollution, poor water quality, and disturbance (Kennedy et al., 2023).

The operation of the proposed development has the potential to cause disturbance and displacement to birds, in particular in the sensitive bird areas presented in Appendix E and are described in Section 2.4.3.1. The bay is a resource for nationally and internationally important numbers of wintering waterbirds which rely on the bay as a foraging and roosting resource. This section presents the potential sources of disturbance and disturbance impacts which are specific to the operational phase of the proposed development. Greenway users including people and dogs have the potential to cause disturbance through their visible presence and by producing noise on the greenway itself, or by accessing wintering bird habitat outside of the greenway.

2.5.4 Other Potential Effects on the Natural Environment

2.5.4.1 Construction Phase

Habitat Loss

The proposed development is situated in an area dominated by agricultural grasslands (GA1), and wet grasslands which are used for livestock grazing. Much of the route is located on the disused railway corridor. The disused railway corridor varies in condition. Some sections are overgrown with scrub whereas other sections are clear and in use as farm tracks. The corridor is often delineated by hedgerows. In some areas, the disused railway corridor has been subsumed into the surrounding fields.

Habitat loss will occur under the direct footprint of the greenway, the 1m verges, and the footprint of the fencing and landscape planting outside the fence line, as well as at the trail heads at Moyasta and Kilrush. In general, the existing vegetation outside of the fence line but within the redline boundary will be retained. This will include hedgerows, treelines, scrub and woodland. The proposed development is entirely outside of saltmarsh habitat and no habitat loss of saltmarsh or other estuarine or intertidal habitats will occur.

A total of 4.2km of linear scrub and hedgerows will be cleared to facilitate construction over the total length of the proposed development (approximately 15km). This habitat is within the railway corridor or where the greenway will pass through hedgerows off the railway line.

Habitat Fragmentation and Barrier Effect

The proposed development includes fencing along the route which could inhibit the movement of species including otter across the greenway.

Habitat Degradation

The construction and operation of the proposed development could lead to habitat degradation. The potential impacts are discussed below.

Habitat degradation - Water Quality Impacts

Water quality impacts arising from the construction of the proposed development have the potential to affect habitats and species which are hydrologically connected to the proposed development. The proposed development will involve site clearance, the construction of the greenway and verges, water settlement areas and watercourse crossings. During the construction phase, surface water run off or flood events could mobilise sediment or pollutants and carry them to downstream waterbodies. While standard measures to prevent pollution to watercourses (TII, 2008) will be utilised throughout the construction period, the use of concrete and machinery may result in accidental pollution events via cementitious materials and fuel entering the watercourses. Dust arising from construction works could lead to sedimentation in the watercourses. This could negatively impact aquatic species, aquatic vegetation, otter, waterbirds and terrestrial species which rely on the estuary.

Habitat degradation – Introduction or Spread of Invasive Species

Construction activities could introduce or spread invasive species within the site, into the surrounding area and to further afield. Invasive species could be spread through the movement of equipment and contaminated soil to and from the site. Machinery or materials contaminated with invasive species from other locations could lead to the introduction of other invasive species to the location of the proposed development.

The spread of invasive species could lead to these species to becoming more prevalent in the surrounding area. Only one invasive species, Japanese Knotweed, has been recorded on the site. This species can form dense thickets which can shade and out-compete native vegetation, and significantly reduce local biodiversity.

Habitat Degradation - Lighting

Lighting will be utilised during the construction of the proposed development. The illumination of otherwise dark spaces can cause disturbance, alter foraging habits, increase the risk of predation and displace nocturnal animals from the area.

Direct Mortality

Direct mortality is possible as a result of site clearance and vegetation removal. Birds are particularly vulnerable during the nesting season (March-August inclusive) when vegetation clearance could lead to the loss of nests. Mammals such as Otter may be killed by construction machinery, although these will be slow moving and loud vehicles so the collision risk is very low.

2.5.5 Operational Phase

2.5.5.1 Disturbance to Breeding Birds

Several amber and red-listed bird species were recorded as 'possible' and 'probable' breeding species in the area surrounding the proposed development. Ringed Plover (amber listed) is the only confirmed breeding bird species in the study area. The amber listed and red listed species below were not confirmed as breeding but were recorded as either 'probable' or 'possible' breeders:

- Red: Oystercatcher, Dunlin, Grey Wagtail
- Amber: Shelduck, Herring Gull, Ringed Plover, Black-headed Gull, Common Gull, Teal

Breeding waders are a group of birds which have experienced some of the most dramatic population declines across the world, in Western Europe and in Ireland (Gibbons et al., 1993; Balmer et al., 2013; Suddaby et al., 2020) with declines of up to 91% of the population since 2009 (Dunlin) (Suddaby et al., 2020). The primary drivers of this decline are habitat loss through agricultural intensification and increased levels of predation (BirdLife International, 2004). There is suitable habitat for ground-nesting birds surrounding the proposed development, and therefore breeding birds could be present in this area.

Ringed Plover is an amber-listed species (BoCCI4 (Gilbert et al., 2021) due to its Irish wintering population representing 25% of the European wintering population. Breeding populations contribute directly to the wintering populations of waders, therefore any impact to breeding populations could also impact winter populations.

The presence of the greenway has the potential to displace nesting birds. Species that require open habitats for nesting may experience a greater risk and exposure to predation in fragmented habitats. Mammalian predators utilise vegetated habitats (woodland and hedgerows) for cover, and therefore nests closer to the edges of these habitats are more exposed to predators and have higher levels of nest failure (Kaasiku et al., 2022). However, the proposed development is located entirely adjacent to existing boundaries such as hedgerows, the former railway line and existing roads, and therefore the proposed development will not result in fragmentation of existing open habitats in the surrounding area. The proposed development will not contribute to habitat fragmentation of breeding wader habitat or to increased predation effects because of the presence of the development. However, other sources of changes to predation risk are discussed below in Section 2.5.2.5.

Disturbance due to greenway users could cause ground-nesting birds to leave their nests. This can cause nest failure if incubating birds are forced to leave the nest for exposed periods or repeatedly and eggs are left exposed to inclement weather or predators. Chicks may also die if left exposed to inclement weather or predators.

The single confirmed breeding record of ringed plover was in the area of the Kilrush Wastewater Treatment Plant, at a distance of c.150m from the proposed development. At this location there is an existing road which is publicly accessible and there is a hedgrow along this road. As this section will not be altered as a result of the proposed development it is already publicly accessible, there is no risk of causing disturbance to breeding waders at this location.

2.5.5.2 Collision Risk, Alteration to Flightlines and Barriers to Movement

Moyasta bridge and the crossing of Poulnasherry Bay is the only location where the greenway is elevated and across an intertidal area. The existing bridge deck and railway line is 4.4m above the mudflats below the bridge, with the top of the existing parapets at 4.9m high. The proposed parapets on the bridge are 1.4m above the greenway level and will bring the total height to 5.8m - an increase of 900mm. Birds are present on both sides of the bridge on the intertidal and salt marsh habitats. In theory, the additional height of the parapet could pose a collision risk to birds. However, the cross section of the bridge will not change meaningfully and the new parapets are solid with a low permeability perforated section. Bird collisions with man-made structures are normally considered to be caused by 'invisibility', particularly at night; deception, caused by glazing in buildings; and confusion, caused by light refracted or reflected by mist. Structures that do not exhibit these features are rarely implicated in scientific literature as agents of bird mortality.

Moyasta bridge and the crossing of Poulnasherry Bay is the only location where an elevated barrier would be introduced to the routes of bird flight paths. Any obstacle, natural or man-mad can alter a birds flight path, including mountains, trees, buildings or other structures. Moving or hard to see obstacles such as wind turbines, glass buildings or powerlines pose the biggest risk to birds as they can deaths directly. The existing bridge deck and railway line is a height of 4.4m above the mudflat, and shown below in Plate 2.3. The proposed parapets and screening at 1.4m high will bring the total height of the structure to 5.8m. Wintering waterbirds forage within these mudflats immediately adjacent to the bridge and former railway line. Birds make regular movements across the railway line at this location. The additional height of the screening could alter bird movements and result in a reduction in birds utilising the habitats on either side of the railway line.

However, the increase in height by 900mm (4.9m to 5.8m) and of 1.4m of the screening will not cause a barrier to movement. The raised level of the bridge will cause birds to alter their flight lines to gain sufficient height to pass over the new level. Flight at a higher level will require additional energy expenditure to achieve, however this will not be significant as this is likely to only affect small numbers of birds foraging close to the bridge and require small increases in energy expenditure to achieve the additional height. Wader species are agile and a difference of 1.4m will not cause them to change their flight patterns. Flocks arriving at the site from greater distances are more likely to be flying at height and only minor adjustments will be required to avoid the new bridge parapet. The majority of studies of bird collision and obstacle avoidance focus on large structures such as wind turbines, in these cases impacts can be avoided through the use of smaller turbines c. 150m tall (SNH, 2020). Considering this, an increase of 1.4m will not change the flight paths of birds.

The flight path beneath the bridge will not be altered. Larger birds such as ducks, geese and swans require larger take-off distances and are less likely to make regular flights across the bridge. These species would be more likely to swim underneath the bridge to access the north side.

Plate 2.3 Moyasta bridge and causeway at low tide

2.5.5.3 Alteration of Foraging Habits and Predation Risk

The proposed development will be fenced on both sides. Fencing is to be installed for a number of purposes, including to keep greenway users and dogs on the greenway and to prevent access to surrounding private lands and habitats, and to prevent disturbance to birds and other wildlife. However, the presence of fencing could result in indirect impacts to waders (both breeding and wintering), through increased predation risk or perceived predation risk.

Predation of eggs and chicks is a major source of nest failure of breeding waterbirds. Avian predators such as raptors and corvids contribute as one source of predation risk along with mammalian predators. Raptors can also be a prominent source of wader mortality at wintering sites (Whitfield, 2008; Cresswell and Whitfield, 1994). Raptors and corvids utilise man-made structures such as fence posts, signs, stone walls as a perch to search for prey. The use of elevated perches improve visibility for raptors and can increase predator hunting success (Andersson, 1978). Higher perches improve hunting success by raptors, and these are recommended to be at a height of at least 4.5 m, in locations aiming to improve habitat quality for raptors (Kross et al 2024). However, raptors are also known to hunt successfully from lower height perches including those below 1m and that waders will avoid nesting in the vicinity of perches, even low perches of <1m (Andersson et al., 2009). The presence of perches near wader habitat can reduce the suitability of the habitat for breeding waders (Andersson et al., 2009; Wallander, 2006). Therefore, the fences proposed may increase the quality of the habitat for raptors and corvids by increasing their hunting success. This could result in waders altering foraging or nesting habits to avoid the perceived predation risk, or lead to an increase in wader mortality through improved hunting success for raptors or increase nest predation leading to negative impacts to waterbird populations.

The single confirmed breeding record of ringed plover was in the area of the Kilrush Wastewater Treatment Plant, at a distance of c.150m from the proposed development. At this location there is an existing road which is publicly accessible and there is vegetative screening lining this road. As the proposed development will not contribute elevated raptor perches and due to the presence of existing potential raptor perches associated with the existing vegetation at the wastewater treatment plant, there is no risk of introducing new raptor perches at this location.

In general, the proposed development is located along existing boundaries, which contain vegetation or fence posts which can provide elevated raptor perches. The surrounding environment is agricultural land comprised of small fields with hedgerow / treeline / scrub boundaries. Many field boundaries contain fence lines. In some areas several lines of new and old fence lines exist together.
Given this, the length of the proposed development contains existing raptor perches and the proposed planting and fencing will not increase significantly from the baseline. Therefore, there will be no significant increase in predation risk to wintering and breeding birds along the length of the proposed development, with the exception of at Moyasta Bridge.

Moyasta bridge is at an existing height of 4.4m above the surrounding mudflats and the existing parapet is at a height of 4.9m. The proposed parapet on the bridge will increase the total height to 5.8m. The increased height of the parapet could increase use of the bridge as a hunting perch. Wintering waterbirds forage and roost within the mudflats immediately adjacent to the bridge and former railway line. The presence of a new elevated perch will increase the exposure of the waterbirds to raptor predation during the operation of the proposed development.

2.5.5.4 Habitat Degradation

Habitat Degradation - Water Quality Impacts

Drainage will generally be over the edge, and will outfall to existing watercourses via field drains. Pipes, culverts and headwalls will be provided as required where the greenway crosses existing field drains and to connect the larger surfaced areas at the trailheads to the drainage network.

Vehicles at the trailheads present a source of pollutants. There is a risk of pollutants entering watercourses and reaching Poulnasherry Bay and Kilrush Harbour. Pollutants could result in negative effects to aquatic habitats and species and to species which are dependent on these habitats.

The introduction and increase in the numbers of greenway users including people and dogs may lead to an increase in dog fouling and human waste along the proposed development. Responsible dog owners will clean up after their dogs, however, there will be a proportion that does not. Dog faeces contain high levels of nitrogen and phosphorous. Surface runoff from the greenway contaminated with dog faeces could increase nutrient levels and oxygen demand in receiving surface waterbodies, negatively impacting water quality. Given the dilution capacity of the coastal waterbodies and the extent of the buffer zones between the greenway and the receiving waterbodies the effects during the operational phase on the coastal waterbody are unlikely. The significance of the effects on the water quality of receiving waterbodies are assessed as being imperceptible and of temporary duration.

Toilets at the trailheads could also be a source of pollution to waterbodies, lack of appropriate maintenance or an incident of vandalism could result in human waste and chemicals entering the waterbodies. The input of nutrients to water courses and waterbodies via animal and human waste could result in negative effects to aquatic habitats and species and to species which are dependent on these habitats.

Habitat Degradation - Lighting

Public lighting will be installed at trail heads as part of the operational phase of the proposed development. Public lighting is not proposed along the main length of the greenway. The illumination of otherwise dark spaces can cause disturbance, alter foraging habits, increase the eseprrisk of predation and displace nocturnal animals from the area.

Habitat Degradation – Introduction of Invasive Species

As detailed above, construction phase activities could result in the spread of invasive species to, from, and within the proposed development. These species could become established in new locations and lead to long term degradation of other habitats, and negatively impacting biodiversity during operation.

2.5.5.5 Habitat Fragmentation and Barrier Effect

The proposed development will result in some habitat fragmentation as it bisects certain areas of habitat including seven watercourse crossings, hedgerows and the railway corridor. The proposed development will include fencing where there is currently no boundary, which could act as a barrier to wildlife. The specification for Otter exclusion fencing (Natural England, 2026) states that otter can pass through gaps of 100mm. In this context, the proposed fencing is considered to balance habitat connectivity for Otter and restrict access for all but the smallest dogs.

2.5.5.6 Direct Mortality

As the proposed development is a cycleway and walkway development, potential collisions with wildlife by greenway users are very unlikely. The maintenance of hedgerows could result in the loss of nests, if undertaken during the nesting season.

3. IDENTIFICATION OF ADVERSE EFFECTS

3.1 Establishing the Zone of Influence

Section 3.2.3 of DEHLG (2010) outlines the procedure for selecting the European sites to be considered in AA. It states that European sites potentially affected should be identified and listed, bearing in mind the potential for direct, indirect and cumulative effects. It also states that the specific approach in each case is likely to differ depending on the scale and likely effects of the plan or project. However, it advises that the following sites should generally be included:

- All European sites within or immediately adjacent to the plan or project area;
- All European sites within the zone of influence of the plan or project; and,
- In accordance with the Precautionary Principle, all European sites for which there is doubt as to whether or not they might be significantly affected.

The "Zone of Influence" of a project is the geographic extent over which significant ecological effects are likely to occur. In the case of projects, the guidance recognises that the zone of influence must be established on a case-by-case basis using the Source-Pathway-Receptor Model (OPR, 2021). A project may only lead to significant effects on the integrity of the European site where all three elements of Source-Pathway-Receptor are linked. In the absence of one element of this model, Adverse Effects can be screened out with confidence. The assessment should make reference to the following key variables:

- The nature, size and location of the proposed development;
- The nature of the impacts which may arise from the proposed development;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

For example, in the case of a project that could affect a watercourse, it may be necessary to include the entire upstream and/or downstream catchment in order to capture all European sites with water-dependent features of interest.

Having regard to the above key variables, the Zone of Influence was defined as:

- The entire area within 550m of the proposed development.
- All watercourses crossed by the proposed development and downstream within the 'mouth of the Shannon' coastal waterbody as far downstream as the line across the narrow strait between Kilcredaun Point and Kilconly Point at the mouth of the Shannon Estuary and upstream to the line across from Ballynote West to Carrig Island to the east of Poulnasherry Bay. This includes the tidal sections of some watercourses where the water flows upstream on a rising tide.
- SPAs within 15km of the proposed development for the potential ex-situ impacts on wintering birds that are Qualifying Interests.

The presence of humans in an area is unlikely to illicit a response by waterbirds beyond 300m (Cutts et al, 2009). The noise levels from typical construction activity are generally less than 100 dBA. Put into practice, this will mean that if the noise generated was 100 dBA at 1.0m from the source, this sound will be 70 dBA at 32m away. The threshold for noise to have an impact on waterbirds is 70 dBA at receptor (Cutts et al., 2013). Regular noise above this level is likely to illicit a response. This calculation does not take screening from hedgerows into account and therefore, in practice, the impacts from noise and visual disturbance will be less than in an open environment.

A general precautionary terrestrial buffer for disturbance impacts was defined as 550m around the proposed development as this is the flushing disturbance distance for waterbirds, informed by the sensitivity of different species, the potential for visual and noise disturbance, and the baseline noise levels (Cutts et al., 2013).

The waterbodies from the proposed development to the area downstream including the areas between Kilcredaun Point and Kilconly Point, and Ballynote West to Carrig Island is the precautionary distance to which hydrological impacts could occur.

Non-breeding seabirds, wildfowl and waders generally inhabit estuaries, migrating locally between feeding sites, roost and between estuaries. The movements of wintering birds between these sites is likely to be between sites that are close together. Considering this, European sites within 15km of the proposed development have been considered with regard to wintering birds.

A geographical representation of the Zone of Influence was produced in QGIS 3.16.9 using the proposed development boundary. This was used in combination with NPWS shapefiles to identify the boundaries of European sites in relation to the Zone of Influence.

It was determined that eight European sites, namely the Lower River Shannon SAC, the Kilkee Reefs SAC, the Tullaher Lough and Bog SAC, the Carrowmore Dunes SAC, the Carrowmore Point to Spanish Point and Islands SAC, the River Shannon and the River Fergus Estuaries SPA, the Illaunonearaun SPA and the Mid-Clare Coast SPA occur within the Zone of Influence for the proposed development. European sites in the Zone of Influence are shown in Figure 3.1 and 3.2 below.

Tabel 3-1 below lists all the European sites which are connected to the proposed development and describes how those sites are connected to the proposed development. There are no other pathways (including potential ex-situ pathways) between the proposed development and any European sites, other than those listed in Table 3-1. Detailed descriptions of those sites are given in Section 3.2.

Table 3-1 European sites located within the Zone of Influence

European site [site code]	Are there potential pathways for impacts from the proposed development to this site? Explain.
Special Areas of Conservation	
Lower River Shannon SAC [002165]	Yes. The proposed development occurs within this European site at several locations and is adjacent to it for much of its route between Kilrush and Blackweir Bridge.
Kilkee Reefs SAC [002264]	Yes. The proposed development is located at least 660m northwest of this SAC and 1.2km upstream of this European site via the Dough Stream. Due to the crossing of this watercourse by the proposed development, there is a potential pathway for pollutants to be transported to this European site via water runoff.
Tullaher Lough and Bog SAC [002343]	No. The proposed development is located at least 2.8km south of this European site. The Qualifying Interests of this site are bog habitats. There is no hydrological connection, and no other pathways for effects between the proposed development and this European site.
Carrowmore Dunes SAC [002250]	No. The proposed development is located at least 7.5km south of this European site. There is no hydrological connection, and no other pathways for effects between the proposed development and this European site.

European site [site code]	Are there potential pathways for impacts from the proposed development to this site? Explain.
Carrowmore Point to Spanish Point and Islands SAC [001021]	No. The proposed development is located at least 11.5km south of this European site. There is no hydrological connection, and no other pathways for effects between the proposed development and this European site.
Special Protection Areas	
River Shannon and River Fergus Estuaries SPA [004077]	Yes. The proposed development occurs within this European site at several locations and is adjacent to it for much of its route between Kilrush and Blackweir Bridge.
Illaunonearaun SPA [004114]	Yes. The proposed development is located at least 6.3km southeast of this European site. There is no direct pathway for direct impacts on this site, however, Barnacle Goose, the only Qualifying Interest species for this site, is mobile and could use suitable habitat adjacent to the proposed development. Therefore, there is potential for ex-situ adverse effects to occur on this site.
Mid-Clare Coast SPA [004182]	Yes. The proposed development is located at least 7.5km north of this European site. There is no direct pathway for impacts, however, the Qualifying Interests for this European site are mobile and may use habitats adjacent to the proposed development. Therefore, there is potential for ex-situ adverse effects to occur on this site.

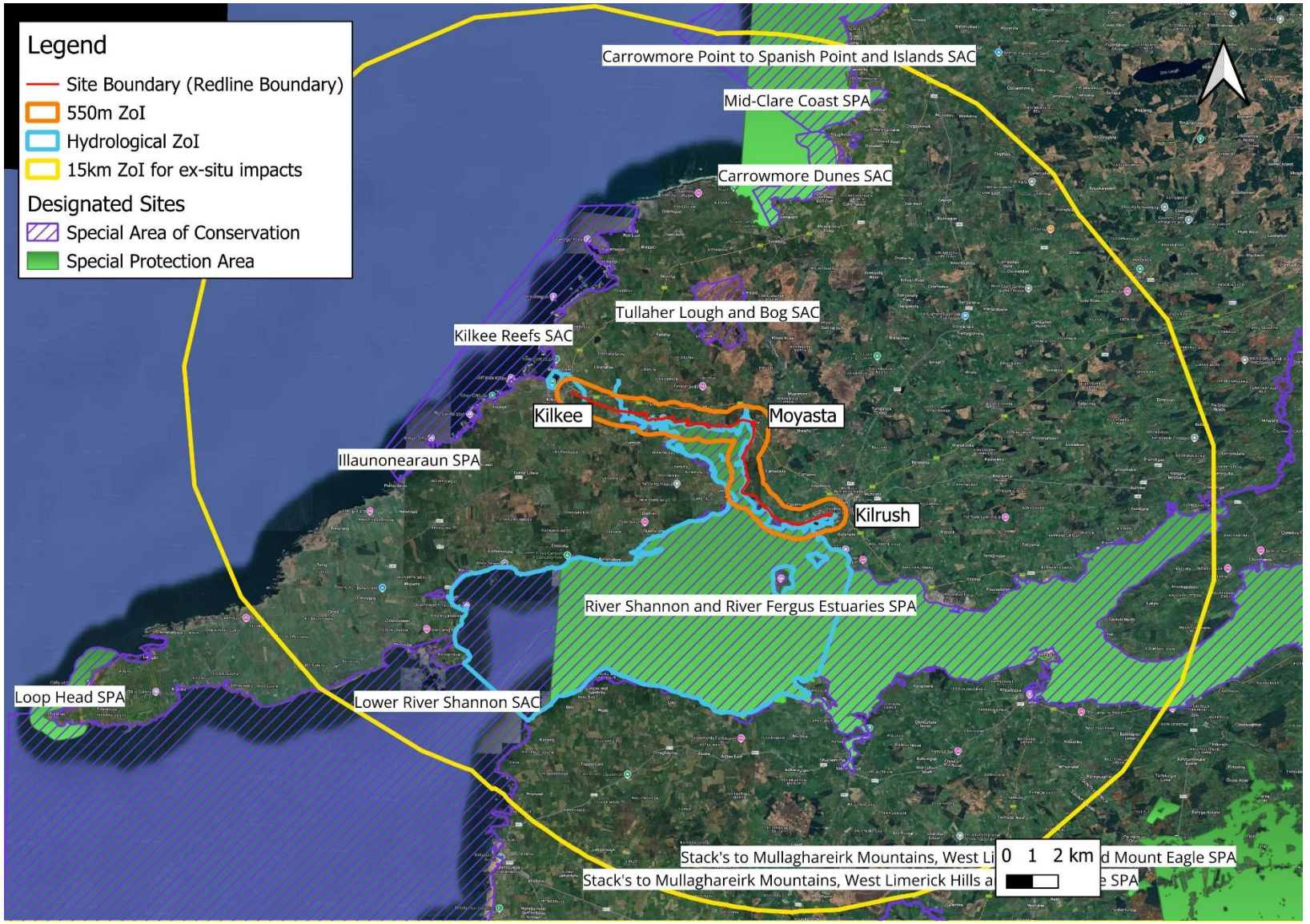

Figure 3-1 Location of European sites in the Zone of Influence

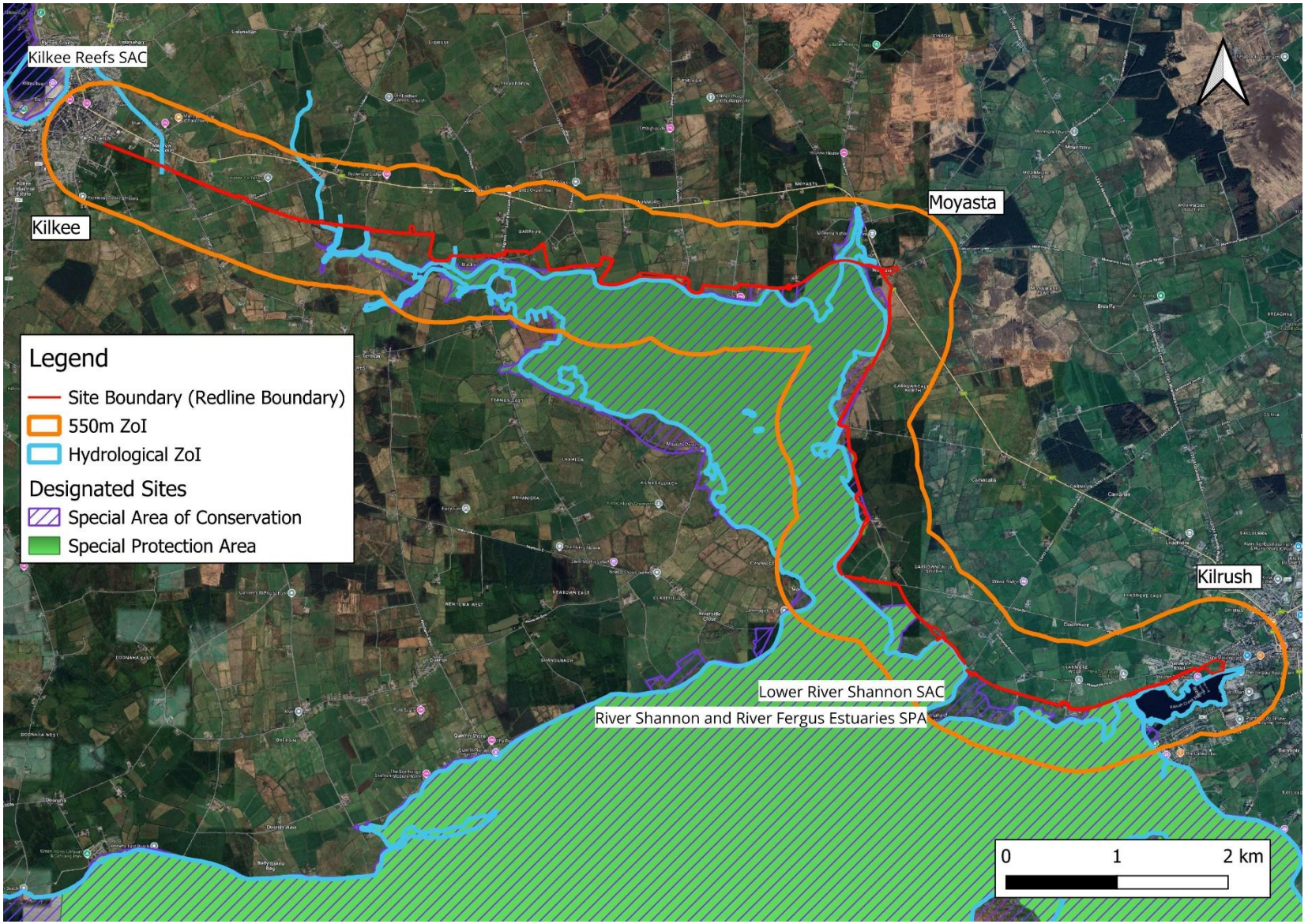

Figure 3-2 Close up of the proposed development and the zone of influence of European sites.

3.2 Site Descriptions

3.2.1 Lower River Shannon SAC

The description of the Lower River Shannon SAC provided here is based on the Site Synopsis (NPWS, 2013) and Site-specific Conservation Objectives (NPWS, 2012a) for the site.

Site Overview

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary. Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes.

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland.

Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Thrift and plantains (*Plantago* sp.). A rare endemic type of sea lavender, *Limonium recurvum* subsp. *pseudotranswallianum*, occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (*Anthyllis vulneraria*) and Common Bird's-foot-trefoil (*Lotus corniculatus*).

Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. One grassland type of particular conservation significance, Molinia meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy.

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well-developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of the Purple Sea Urchin *Paracentrotus lividus* are found.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-Tailed Godwit (476; 1995/96). This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregrine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4,010 individuals at Loop Head, 1987). There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. Otter, a species also listed on Annex II of this Directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon, while the Mulkear catchment excels as a grilse fishery, though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of lamprey.

Freshwater Pearl Mussel (Margaritifera margaritifera), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There are a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments (especially along the Fergus estuary). Further, reclamation continues to pose a threat, as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting, which pose disturbance threats to birds and marine mammals. This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species.

Qualifying Interests of the Site

[1110] Sandbanks which are slightly covered by sea water all the time

[1130] Estuaries

[1140] Mudflats and Sandflats not covered by seawater at low tide

[1150] Coastal Lagoons

[1160] Large Shallow Inlets and Bays

[1170] Reefs

[1220] Perennial Vegetation of Stony Banks

[1230] Vegetated Sea Cliffs of the Atlantic and Baltic Coasts

[1310] Salicornia and other Annuals Colonising Mud and Sand

[1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

[1410] Mediterranean salt meadows (*Juncetalia maritimi*)

[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

[6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

[91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)

[1095] Sea Lamprey (*Petromyzon marinus*)

[1096] Brook Lamprey (*Lampetra planeri*)

[1099] River Lamprey (*Lampetra fluviatilis*)

[1106] Atlantic Salmon (*Salmo salar*)

[1349] Bottle-nosed Dolphin (*Tursiops truncatus*)

[1355] Otter (*Lutra lutra*)

3.2.2 Kilkee Reefs SAC

The description of the Kilkee Reefs SAC provided here is based on the Site Synopsis (NPWS, 2014a) and Site-specific Conservation Objectives (NPWS, 2014b) for the site.

Site Overview

The Kilkee Reefs are situated north of the River Shannon Estuary on the Co. Clare coast. The site stretches for approximately 12km from Ballard Bay to Castle Point. The bedrock is Carboniferous millstone grit and flagstone. A few small islands are included, the largest being Bishop's Island.

The reefs are very exposed to wave action and support excellent examples of communities for this habitat, including one dominated by the mussel *Mytilus edulis*. Deep rock pools have the brown alga *Bifurcaria bifurcata*, whereas the shallower pools towards the low shore have the sea urchin *Paracentrotus lividus*. The low shore has communities characterised by the brown thong weed *Himanthalia elongata* and *Alaria esculenta*. These communities, which are typical of western Ireland, are quite distinct from communities in similar habitats elsewhere in Ireland or north-west Europe. Sub-tidally there are good examples of a variety of reef communities. In shallow water the reefs are steeply sloping with kelp forests of algal species tolerant to sand scour. Communities with less dense kelp and red foliose algae occur and may be very species rich. In deeper water the gently sloping rock is characterised by good examples of the Axinellid sponge community with the sea-fan *Eunicella veruccosa*. The sponge *Phakellia vermiculata* which is rare in shallow water is present. Vertical cliff faces are characterised by the jewel anemone *Corynactis viridis* in both shallow and deep water.

The site contains a number of submerged marine caves which have been formed due to the erosion of the sedimentary rock. These are known to occur in areas such as Donegal Point, George's Head and Biraghty Mor. The caves give shelter to a range of fauna species, including lobsters, crayfish, spider crabs and conger eels, and in summer may be visited by sunfish and triggerfish. Where light permits, soft corals, sponges, jewel anemones and colonial sea squirts crowd the walls.

This site is of conservation importance as it has excellent examples of reefs and includes examples of a shallow bay and marine caves, all habitats listed on Annex I of the E.U. Habitats Directive

Qualifying Interests of the Site

[1160] Large Shallow Inlets and Bays

[1170] Reefs

[8330] Submerged or partially submerged sea caves

3.2.3 River Shannon and River Fergus Estuaries SPA

The description of the River Shannon and River Fergus Estuaries SPA provided here is based on the Site Synopsis (NPWS, 2015a) and Site-specific Conservation Objectives (NPWS, 2012b) for the site.

Site Overview

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. *Macoma-Scrobicularia-Nereis*, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats, and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Whooper Swan, Light-bellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Scaup, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank and Black-headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (57,133 - five year mean for the period 1995/96 to 1999/2000), a concentration easily of international importance. The site has internationally important populations of Light-bellied Brent Goose (494), Dunlin (15,131), Black-tailed Godwit (2,035) and Redshank (2,645). A further 17 species have populations of national importance, i.e. Cormorant (245), Whooper Swan (118), Shelduck (1,025), Wigeon (3,761), Teal (2,260), Pintail (62), Shoveler (107), Scaup (102), Ringed Plover (223), Golden Plover (5,664), Grey Plover (558), Lapwing (15,126), Knot (2,015), Bar-tailed Godwit (460), Curlew (2,396), Greenshank (61) and Black-headed Gull (2,681) - figures are five year mean peak counts for the period 1995/96 to 1999/2000.

The site is among the most important in the country for several of these species, notably Dunlin (13 % of national total), Lapwing (6% of national total) and Redshank (9% of national total). The site also supports a nationally important breeding population of Cormorant (93 pairs in 2010).

The River Shannon and River Fergus Estuaries SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds internationally important populations of four species, i.e. Light-bellied Brent Goose, Dunlin, Black-tailed Godwit and Redshank. In addition, there are 17 species that have wintering populations of national importance. The site also supports a nationally important breeding population of Cormorant. Of particular note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover and Bar-tailed Godwit. Parts of the River Shannon and River Fergus Estuaries SPA are Wildfowl Sanctuaries.

Qualifying Interests of the Site

[A017] Cormorant (*Phalacrocorax carbo*)

[A038] Whooper Swan (*Cygnus cygnus*)

[A046] Light-bellied Brent Goose (*Branta bernicla hrota*)

[A048] Shelduck (*Tadorna tadorna*)

[A050] Wigeon (*Anas Penelope*)

[A052] Teal (*Anas crecca*)

[A054] Pintail (*Anas acuta*)

[A056] Shoveler (*Anas clypeata*)

[A062] Scaup (*Aythya marila*)

[A137] Ringed Plover (*Charadrius hiaticula*)

[A140] Golden Plover (*Pluvialis apricaria*)

[A141] Grey Plover (*Pluvialis squatarola*)

[A142] Lapwing (*Vanellus vanellus*)

[A143] Knot (*Calidris canutus*)

[A149] Dunlin (*Calidris alpina*)

[A156] Black-tailed Godwit (*Limosa limosa*)

[A157] Bar-tailed Godwit (*Limosa lapponica*)

[A160] Curlew (*Numenius arquata*)

[A162] Redshank (*Tringa totanus*)

[A164] Greenshank (*Tringa nebularia*)

[A179] Black-headed Gull (*Chroicocephalus ridibundus*)

[A999] Wetland and Waterbirds

3.2.4 Illaunonearaun SPA

The description of the Illaunonearaun SPA provided here is based on the Site Synopsis (NPWS, 2014c) and Site-specific Conservation Objectives (NPWS, 2024) for the site.

Site Overview

Illaunonearaun is a small inaccessible island located approximately 300m off the west Co. Clare coast, about 7km south-west of Kilkee. It is a large flat-topped sea stack surrounded by high cliffs and a rocky shore. Several rocky reefs occur off the north-west shore. The island supports a maritime grassland sward dominated by Red Fescue (*Festuca rubra*) and with a variety of typical maritime plants such as Thrift (*Armeria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*) and Sea Mayweed (*Matricaria maritima*) also occurring. The sea surrounding the island, to a distance of 200 m, where seabirds forage, bathe and socialise, is included in the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Barnacle Goose.

The island is regularly used in winter by a Barnacle Goose flock. Flock size varies as birds move between here and Mutton Island to the north; up to 200 birds have been recorded (as, for example, in spring 1988), but numbers are usually less than this, such as in 1994 (22 birds) and 1998 (142 birds).

The island is an important breeding site for seabirds. A Cormorant colony was established in the 1970s and 60 individuals were recorded in 1995. Other species which breed include Fulmar (10 pairs in 1993), Great Black-backed Gull (c. 25 pairs), Lesser Black-backed Gull (35 pairs in 1999) and Herring Gull (6 pairs in 2002).

Illaunonearaun SPA is of conservation importance due to the presence of a Barnacle Goose flock that exceeds the qualifying threshold for national importance; this species is listed on Annex I of the E.U. Birds Directive.

Qualifying Interests of the Site

[A045] Barnacle Goose (*Branta leucopsis*)

3.2.5 Mid-Clare Coast SPA

The description of the Mid-Clare Coast SPA provided here is based on the Site Synopsis (NPWS, 2015b) and Site-specific Conservation Objectives (NPWS, 2014d) for the site.

Site Overview

The Mid-Clare Coast SPA site extends along the Co. Clare coastline in a south-southwesterly direction from Spanish Point (3km west of Milltown Malbay) to just west of Doonbeg Bay, a distance of some 14km. It comprises the mainland shoreline, Mutton Island and Mattle Island, a series of rocky reefs and the open marine water of Mal Bay between the islands and the mainland. The headlands and islands experience some of the most severe conditions of exposure in Ireland.

The mainland shoreline is mostly rocky or stony, though there are several sandy beaches and areas of intertidal flats. Shingle or stony banks are found at the base of cliffs and at the head of bays. The stretch of coastline between Quilty and Lurga Point has extensive areas of mud and sand flats and further intertidal flats occur at Doughmore Bay and Doonbeg Bay. Mutton Island is a medium-sized, uninhabited, island situated approximately 1km from Lurga Point.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Barnacle Goose, Ringed Plover, Sanderling, Purple Sandpiper, Dunlin and Turnstone. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Mattle Island supports a nationally important breeding colony of Cormorant, with 60 nests present in May 1990. A nationally important population of Barnacle Goose (250 – 4 survey mean between 1993 and 2003) winters on Mutton Island, with birds occasionally visiting Mattle Island and feeding sites on the mainland. Mutton Island provides both feeding and roosting sites for the species. The mainland shore is important for wintering waders, especially the internationally important population of Purple Sandpiper (393) and nationally important populations of Ringed Plover (316), Dunlin (2,708), Sanderling (272) and Turnstone (571) – all figures are mean peaks for the 5 winters 1995/96 to1999/2000. Other species which occur in winter include Golden Plover (1,446), Grey Plover (36), Oystercatcher (328), Lapwing (1,252), Curlew (486) and Redshank (77). Some of the waders may commute to the islands. The shallow seas are frequented by both Great Northern Diver (9) and Red-throated Diver (2).

The Mid-Clare Coast SPA is of high ornithological importance and supports an internationally important population of Purple Sandpiper, and nationally important populations of wintering Barnacle Goose and four wader species. In summer it is utilized by a range of breeding seabirds including a nationally important colony of Cormorant. Of particular note is that Barnacle Goose, Storm Petrel, Golden Plover, Great Northern Diver and Red-throated Diver are listed on Annex I of the E.U. Birds Directive. Part of the Mid-Clare Coast SPA is a Wildfowl Sanctuary.

Qualifying Interests of the Site

[A017] Cormorant (*Phalacrocorax carbo*)

[A045] Barnacle Goose (*Branta leucopsis*)

[A137] Ringed Plover (*Charadrius hiaticula*)

[A144] Sanderling (*Calidris alba*)

[A148] Purple Sandpiper (*Calidris maritima*)

[A149] Dunlin (*Calidris alpina alpina*)

[A169] Turnstone (*Arenaria interpres*)

[A999] Wetland and Waterbirds

3.3 Evaluation Against Conservation Objectives

Table 3-2 to Table 3-6 below detail the evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the sites identified in Section 3.1 and described in Section 3.2. As explained in Sections 1.2 and 1.3, AA Screening is carried out in view of the Conservation Objectives of the relevant European sites, which are in turn defined by detailed Attributes and corresponding Targets. Therefore, the evaluation of whether or not a likely effect is significant (in view of the Conservation Objective in question) is made with regard to these Attributes and Targets.

Table 3-2 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Lower River Shannon SAC.

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Sandbanks which are slightly covered by sea water all the time [1110]	*"To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area*" and *"Community distribution".* The closest known location of this Qualifying Interest is at least 13km downstream of the proposed development, from Kerry Head to Beal Head (NPWS, 2013). The proposed development does not include any works below the high tide where this habitat occurs. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Estuaries [1130]	*"To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area*" and *"Community distribution".* The closest known location of this Qualifying Interest is at least 2.3km from the proposed development, from Ballynote West across to Carrig Island. This Qualifying Interest is outside the Zone of Influence, therefore no pathways for impacts exist. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Mudflats and sandflats not covered by seawater at low tide [1140]	*"To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area*" and *"Community distribution".* This Qualifying Interest occurs in this European site immediately adjacent to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. However, the proposed development is considered to pose a risk of pollution to this habitat in the event of sedimentation or spillage of pollutants. Pollution can have toxic effects on the community complexes within mudflats and sandflats. **Therefore, Adverse Effects cannot be excluded.**	Yes
Coastal lagoons [1150]	*"To restore the favourable conservation condition of Coastal lagoons in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area*" and *"Salinity regime", "Hydrological regime", "Barrier connectivity between lagoon and sea", "Water quality: chlorophyll a", "Water quality: Molybdate Reactive Phosphorus (MRP)", "Water quality: Dissolved Inorganic Nitrogen (DIN)", "Depth of macrophyte colonisation", "Typical plant species", "Typical animal species", "Negative indicator species".* The closest known location of this Qualifying Interest occurs is at least 1.7km downstream of the proposed development, at Scattery Lagoon on Scattery Island. There will be no works	No

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
		undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. Although this Qualifying Interest is hydrologically connected to the proposed development, there are no Adverse Effects to this Qualifying Interest, as any pollutant would be diluted by the estuary by the time it reached any of the coastal lagoons within the site. Therefore, there are no pathways for impact to occur between this proposed development and the Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	
Large shallow inlets and bays [1160]	*"To maintain the favourable conservation condition of Large shallow inlets and bays in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area*" and *"Community distribution".* The proposed development route is located along the abandoned railway line adjacent to the boundary of this European site. Poulnasherry Bay is comprised of this QI habitat. The proposed development does not provide for any reduction in the permanent area of this habitat within this European site, but the proposed development route runs adjacent to the boundary of this European site. Considering the nature of Large shallow inlets and bays, the hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to the site during the construction phase. These water quality impacts have the potential to deteriorate habitat quality and functioning. **Therefore, Adverse Effects cannot be excluded.**	Yes
Reefs [1170]	*"To maintain the favourable conservation condition of Reefs in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area"* and "Community Distribution" The closest known location of this Qualifying Interest occurs at least 100m south of the proposed development, between Scattery Island and Hog Island. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. However, since the European site is connected hydrologically to the proposed development, there is a pathway for impact between the Qualifying Interest and the proposed development. Considering the nature of reefs, the hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to the site during the construction phase. These water quality impacts have the potential to deteriorate habitat quality and functioning. **Therefore, Adverse Effects cannot be excluded.**	Yes

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Perennial vegetation of stony banks [1220]	*"To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area", "Physical structure: functionality and sediment supply", "Vegetation structure: zonation", "Vegetation composition: typical species and sub-communities" and "Vegetation composition: negative indicator species".* The closest known location of this Qualifying Interest occurs in this European site occurs at least 4km southeast of the proposed development. However, the full extent of this habitat in the Lower River Shannon SAC is currently unknown (NPWS, 2012d). This habitat was not recorded during the ecological surveys undertaken for the proposed development. This is a terrestrial habitat which is not present within 50m of the proposed development and thus has no hydrological connection to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. There are no pathways for impact to occur between the proposed development and this Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	*"To maintain the favourable conservation condition of Vegetated sea cliffs in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat length", "Physical structure: functionality and hydrological regime", "Vegetation structure: zonation", "Vegetation structure: vegetation height", "Vegetation composition: typical species and sub-communities", "Vegetation composition: negative indicator species" and "Vegetation composition: bracken and woody species".* The closest known location of this Qualifying Interest occurs at least 8km southeast of the proposed development, at Kilcredaun Point/Kilconly Point and Loop Head (NPWS, 2013). This habitat was not recorded during the ecological surveys undertaken for the proposed development. This is a terrestrial habitat and thus has no hydrological connection to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. There are no pathways for impact to occur between the proposed development and this Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
***Salicornia* and other annuals colonizing mud and sand [1310]**	*"To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the*	Salt marsh habitat with which these Qualifying Interests correspond was recorded immediately adjacent to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. However, since the European site is	Yes

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
	Lower River Shannon SAC"	connected hydrologically to the proposed development, there is a pathway for impact between these Qualifying Interests and the proposed development. Considering the nature of these salt marsh habitats, the hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to the site during the construction phase. These water quality impacts have the potential to deteriorate habitat quality and functioning. **Therefore, Adverse Effects cannot be excluded.**	
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	*"To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in the Lower River Shannon SAC"*		
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	*"To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in the Lower River Shannon SAC"*		
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	*"To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area*" and *"Hydrological regime: river flow", "Hydrological regime: tidal influence", "Hydrological regime: freshwater seepages", "Substratum composition: particle size range", "Water quality: nutrients", "Vegetation composition: typical species", "Floodplain connectivity" and "Riparian habitat".* The conservation objectives supporting document lists three subtypes that occur within the European site, two of which are associated with tidal rivers. However, the small streams and drainage ditches crossed by the proposed development do not comprise the large tidal rivers associated with this habitat. This QI habitat occurs a considerable distance upstream of the proposed development within the River Shannon and Fergus Estuaries, this is outside of the zone of influence of the proposed development. There is no pathway for impacts to this habitat. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Molinia meadows on calcareous, peaty or clayey-silt-laden soils	*"To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt laden*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area*" and *"Vegetation structure: broadleaf herb: grass ratio", "Vegetation structure: sward height", "Vegetation composition: typical species", "Vegetation composition: notable species", "Vegetation composition: negative indicator species", "Vegetation composition: negative*	No

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
(*Molinion caerulaea*) [6410]	*soils (Molinion caeruleae) in the Lower River Shannon SAC"*	*indicator moss species", "Vegetation structure: woody species and bracken (Pteridium aquilinum)" and "Physical structure: bare ground".* This Qualifying Interest was not recorded during the habitat surveys undertaken for the proposed development and the closest known location of this habitat was at least 63km from the proposed development, at Worldsend on the River Shannon (NPWS, 2013) The current distribution of this habitat is currently unknown (NPWS, 2012a). **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	*"To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on "*Habitat distribution*", *"Habitat area", "Woodland size", "Woodland structure: cover and height", "Woodland structure: community diversity and extent", "Woodland structure: natural regeneration", "Hydrological regime: flooding depth/height of water table", "Woodland structure: dead wood", "Woodland structure: veteran trees", "Woodland structure: indicators of local distinctiveness", "Vegetation composition: native tree cover", "Vegetation composition: typical species" and "Vegetation composition: negative indicator species".* The closest known location of this Qualifying Interest is at least 35km east of the proposed development, near Limerick city. This habitat was not recorded during the ecological surveys undertaken for the proposed development. This is a terrestrial habitat and thus has no hydrological connection to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. There are no pathways for impacts to occur between the proposed development and this Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029]	*"To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Distribution", "Population size", "Population structure: recruitment", "Population structure: adult mortality", "Habitat extent", "Water quality: macroinvertebrate and phytobenthos (diatoms)", "Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants)", "Substratum quality: sediment"* , *"Substratum quality: oxygen availability", "Hydrological regime: flow variability"* and *"Host fish".* The closest known location of this Qualifying Interest occurs in parts of the Cloon River, which is 15km upstream, east of the development. This Qualifying Interest occurs outside the Zone of Influence, in a different catchment, therefore, there are no pathways for effects to occur between the proposed development and this Qualifying Interest.	No

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
		Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.	
Brook Lamprey (*Lampetra planeri*) [1096]	*"To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC"*	The Attributes of these Conservation Objectives focus on *"Distribution", "Population structure of juveniles", "Juvenile density in fine sediment", "Extent and distribution of spawning habitat"* and *"Availability of juvenile habitat".* This Qualifying Interest is a freshwater species and has been recorded spawning in the Lower Shannon and its tributaries. As this species occurs upstream of the proposed development, above the tidal limit. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Sea Lamprey (*Petromyzon marinus*) [1095]	*"To maintain the favourable conservation condition of Brook Lamprey in the Lower River Shannon SAC"*	These Qualifying Interests have been recorded spawning in the Lower Shannon or its tributaries. The hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to this European site during the construction phase of the proposed development, thereby negatively affecting these Qualifying Interests. These Qualifying Interests migrate from the sea through the zone of influence, therefore there are Adverse Effects to water quality. The installation of culverts has the potential create a barrier to migration. **Therefore, Adverse Effects cannot be excluded**.	Yes
River Lamprey *(Lampetra fluviatilis*) [1099]	*"To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC"*		
Atlantic Salmon (*Salmo salar*) [1106]	*"To restore the favourable conservation condition of Salmon in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Distribution: extent of anadromy", "Adult spawning fish", "Salmon fry abundance", "Out-migrating smolt abundance"*, *"Number and distribution of redds"* and *"Water quality".* Atlantic salmon have been observed spawning in the lower Shannon or its tributaries. The hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to this European site during the construction phase of the proposed development, thereby negatively affecting this Qualifying Interest. The installation of culverts for the proposed development has the potential to create a barrier to migration for this Qualifying Interest. **Therefore, Adverse Effects cannot be excluded.**	Yes

Qualifying Interest	Conservation Objective as per NPWS (2012a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Bottlenose Dolphin (*Tursiops truncatus*) [1349]	*"To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Access to suitable habitat", "Habitat use: critical areas" and "Disturbance".* The closest known locations of critical habitat area for Bottlenose Dolphin is 2.5km south of the proposed development in the Lower Shannon Estuary (NPWS, 2013). The habitat range of the species occurs in much of the Lower Shannon Estuary and includes Poulnasherry Bay, which the route of the proposed development follows. The hydrological connection via four watercourses provides a pathway for sediment laden runoff and other pollutants to be transported to areas within the SAC utilised by this Qualifying Interest during the construction of the proposed development, which could lead to habitat deterioration in areas used by this Qualifying Interest. **Therefore, Adverse Effects cannot be excluded.**	Yes
Otter (*Lutra lutra*) [1355]	*"To restore the favourable conservation condition of Otter in the Lower River Shannon SAC"*	The Attributes of this Conservation Objective focus on *"Distribution", "Extent of terrestrial habitat", "Extent of marine habitat", "Extent of freshwater (river) habitat", "Extent of freshwater (lake/lagoon) habitat", "Couching sites and holts", "Fish biomass available" and "Barriers to connectivity".* The ecological surveys undertaken for the proposed development recorded evidence of otters immediately adjacent to the proposed development. No otter holts were recorded within 150m upstream or downstream of any of the proposed crossings. Human activity, noise and vibration during the construction of the proposed development, as well as human activity and presence of dogs during the operation phase, may cause disturbance to otter, and may exclude them from otherwise suitable foraging, commuting, resting and holting habitat, and sever otter territories. Due to the proximity between the proposed development and suitable otter habitat along the Shannon Estuary and Poulnasherry Bay, there is potential for habitat loss and disturbance impacts to this species. The hydrological connection provides a pathway for sediment laden runoff and other pollutants to be transported to this European site during the construction of the proposed development, which could lead to habitat deterioration in the areas used by this Qualifying Interest. **Therefore, Adverse Effects cannot be excluded.**	Yes

Table 3-3 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Kilkee Reefs SAC.

Qualifying Interest	Conservation Objective as per NPWS (2014b)	Do the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Large shallow inlets and bays [1160]	*"To maintain the favourable conservation condition of Large shallow inlets and bays in Kilkee Reefs SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area"* and *"Community distribution".* The closest known location of this Qualifying Interest occurs at least 760m northwest the proposed development, at Kilkee Bay. The proposed development crosses the Dough stream which flows into the European site. As the Qualifying Interest occurs 1.5km downstream of the proposed development, there is a pathway for impact through hydrological connection. The crossing of the Dough stream occurs 1.4km from the SAC. The stream flows through the town of Kilkee before reaching Kilkee Bay. There are no Adverse Effects due to the high level of dilution that would occur by the time any potential pollutants would reach Kilkee Bay. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Reefs [1170]	*"To maintain the favourable conservation condition of Reefs in Kilkee Reefs SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area", "Distribution"* and *"Community structure".* The closest known location of this Qualifying Interest occurs at least 900m northwest of the proposed development, at Kilkee Bay. The proposed development crosses the Dough stream, which flows into the European site. As the Qualifying Interest occurs 900m downstream of the proposed development, there is a pathway for impact to occur. However, sediment loads would be so diluted that there would be no Adverse Effects to the Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No
Submerged or partially submerged sea caves [8330]	*"To maintain the favourable conservation condition of Submerged or partially submerged sea caves in Kilkee Reefs SAC"*	The Attributes of this Conservation Objective focus on *"Habitat area", "Distribution"* and *"Community structure".* The closest known location of this Qualifying Interest occurs at least 2km of the proposed development, at George's Head. The proposed development crosses the Dough stream, which flows into the European site, creating a pathway for impact to occur Any pollutant or sediment within the proposed development would be diluted when reaching Kilkee Bay that there would be no Adverse Effects on this Qualifying Interest. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No

Table 3-4 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the River Shannon and River Fergus Estuaries SPA

Qualifying Interest	Conservation Objective as per NPWS (2013a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effects
Cormorant (*Phalacrocorax carbo*) [A017]	*"To maintain the favourable conservation condition of Cormorant in the River Shannon and River Fergus Estuaries SPA"*	During the wintering bird surveys undertaken for the proposed development, all of these Qualifying Interests were recorded except for Whooper Swan and Scaup. However, suitable habitat for these Qualifying Interests occurs within this SPA and therefore they could still occur in close proximity of the proposed development. <u>Disturbance</u> This European site is crossed by the proposed development at multiple locations and some sections are directly adjacent to the SPA. Given the proximity of this European site to the proposed development, disturbance to these Qualifying Interests could occur. <u>Water Quality</u> There are four watercourses that drain into Poulnasherry Bay, providing a pathway for sediment laden runoff and other pollutants to be transported to this European site, thereby negatively affecting suitable habitat for these Qualifying Interests. Changes to water quality via potential pollution and sedimentation that may occur during the construction phase of the proposed development have the potential to directly impact the biological communities in the habitats in which these Qualifying Interests forage in the wider SPA area (via alteration of food webs, quantity of primary producers, nutrient cycles, etc.) forcing these Qualifying Interests to move into more suitable areas. **Therefore, Adverse Effects cannot be excluded.**	Yes
Whooper Swan (*Cygnus cygnus*) [A038]	*"To maintain the favourable conservation condition of Whooper Swan in the River Shannon and River Fergus Estuaries SPA"*		
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	*"To maintain the favourable conservation condition of Light-bellied Brent Goose in the River Shannon and River Fergus Estuaries SPA"*		
Shelduck (Tadorna tadorna) [A048]	*"To maintain the favourable conservation condition of Shelduck in the River Shannon and River Fergus Estuaries SPA"*		
Teal (*Anas crecca*) [A052]	*"To maintain the favourable conservation condition of Teal in the River Shannon and River Fergus Estuaries SPA"*		
Pintail (*Anas acuta*) [A054]	*"To maintain the favourable conservation condition of Pintail in the River Shannon and River Fergus Estuaries SPA"*		
Scaup (*Aythya marila*) [A062]	*"To maintain the favourable conservation condition of Scaup in the River Shannon and River Fergus Estuaries SPA"*		
Ringed Plover (*Charadrius hiaticula*) [A137]	*"To maintain the favourable conservation condition of Ringed Plover in the River Shannon and River Fergus Estuaries SPA"*		

Qualifying Interest	Conservation Objective as per NPWS (2013a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effects
Golden Plover (*Pluvialis apricaria*) [A140]	*"To maintain the favourable conservation condition of Golden Plover in the River Shannon and River Fergus Estuaries SPA"*		
Grey Plover (*Pluvialis squatarola*) [A141]	*"To maintain the favourable conservation condition of Grey Plover in the River Shannon and River Fergus Estuaries SPA"*		
Lapwing (*Vanellus vanellus*) [A142]	*"To maintain the favourable conservation condition of Lapwing in the River Shannon and River Fergus Estuaries SPA"*		
Knot (*Calidris canutus*) [A143]	*"To maintain the favourable conservation condition of Knot in the River Shannon and River Fergus Estuaries SPA"*		
Dunlin (*Calidris alpina*) [A149]	*"To maintain the favourable conservation condition of Dunlin in the River Shannon and River Fergus Estuaries SPA"*		
Black-tailed Godwit (*Limosa limosa*) [A156]	*"To maintain the favourable conservation condition of Black-tailed Godwit in the River Shannon and River Fergus Estuaries SPA"*		
Bar-tailed Godwit (*Limosa lapponica*) [A157]	*"To maintain the favourable conservation condition of Bar-tailed Godwit in the River Shannon and River Fergus Estuaries SPA"*		
Curlew (*Numenius arquata*) [A160]	*"To maintain the favourable conservation condition of Curlew in the River Shannon and River Fergus Estuaries SPA"*		
Redshank (*Tringa totanus*) [A162]	*"To maintain the favourable conservation condition of Redshank in the River Shannon and River Fergus Estuaries SPA"*		

Qualifying Interest	Conservation Objective as per NPWS (2013a)	Does the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effects
Greenshank (*Tringa nebularia*) [A164]	*"To maintain the favourable conservation condition of Greenshank in the River Shannon and River Fergus Estuaries SPA"*		
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	*"To maintain the favourable conservation condition of Black-headed Gull in the River Shannon and River Fergus Estuaries SPA"*		
Wigeon (*Mareca penelope*) [A855]	*"To maintain the favourable conservation condition of Wigeon in the River Shannon and River Fergus Estuaries SPA"*		
Shoveler (*Spatula clypeata*) [A857]	*"To maintain the favourable conservation condition of Shoveler in the River Shannon and River Fergus Estuaries SPA"*		
Wetland and Waterbirds [A999]	*"To maintain the favourable conservation condition of the wetland habitat in the River Shannon and River Fergus Estuaries SPA as a resource for the regularly occurring migratory waterbirds that utilise it."*	The Conservation Objective for Wetlands is defined by a single Attribute, namely *"Wetland habitat area",* the Target for which is "*The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261ha, other than that occurring from natural patterns of variation".* The proposed development does not provide for any reduction in the permanent area of wetland habitat within this European site and has no potential to delay or interrupt the achievement of this Conservation Objective. However, water quality impacts could alter waterbirds use of this habitat. **Therefore, Adverse Effects cannot be excluded.**	Yes

Table 3-5 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Illaunonearaun SPA.

Qualifying Interest	Conservation Objective as per NPWS (2024)	Do the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Barnacle Goose (*Branta leucopsis*) [A045]	*"To restore the Favourable conservation condition of Barnacle Goose at Illaunonearaun SPA"*	The Attributes of this Conservation Objective focus on *"Winter population trend", "Winter spatial distribution", "Disturbance at wintering site", "Barriers to connectivity and site use", "Forage spatial distribution, extent and abundance", "Roost spatial distribution and extent"* and *"Supporting habitat: area and quality".* Barnacle Goose is a winter visitor from Greenland and occurs on remote islands where it is relatively free from disturbance. This species is Amber Listed in Ireland (BoCCI, 2021). This European site is designated for this Qualifying Interest as it supports a flock that exceeds the qualifying threshold for national importance (NPWS, 2014). During the wintering bird surveys undertaken for the proposed development, this species was not recorded. However, suitable habitat for this Qualifying Interest occurs adjacent to the proposed development in Poulnasherry Bay. This species is mobile and therefore, may forage within Poulnasherry Bay. The European site is about 7km from Kilkee. There will be no works undertaken within this European site, and there will be no land-take of suitable habitat for this species for the purposes of the proposed development. <u>Water Quality</u> Changes to water quality via potential pollution and sedimentation that may occur during the construction phase of the proposed development have the potential to directly impact the biological communities in Poulnasherry Bay. Ex-situ effects to this Qualifying Interest (via alteration of food webs, quantity of primary producers, nutrient cycles, etc.) may occur within Poulnasherry Bay, where suitable habitat for this Qualifying Interest occurs. <u>Disturbance</u> Although this European site is located 7km southwest from the proposed development, this Qualifying Interest is mobile and may use habitats adjacent to the proposed development. Due to the potential use of habitats within close proximity to the proposed development by this Qualifying Interest, disturbance is an Adverse Effect of the proposed development on this Qualifying Interest. **Therefore, Adverse Effects cannot be excluded.**	Yes

Table 3-6 Evaluation of the likely effects of the proposed development in view of the Conservation Objectives of the Mid-Clare Coast SPA.

Qualifying Interest	Conservation Objective as per NPWS (2014d)	Do the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Cormorant (*Phalacrocorax carbo*) [A017]	*"To maintain the favourable conservation condition of Cormorant in Mid-Clare Coast SPA"*	This European site is located at least 7.7km north of the proposed development. During the wintering bird surveys undertaken for the proposed development, all of these Qualifying Interests were recorded, with the exception of Barnacle Goose and Purple Sandpiper. The Qualifying Interests are mobile and utilise the habitats in the Shannon Estuary adjacent to the proposed development. <u>Water Quality</u> Changes to water quality via potential pollution and sedimentation that may occur during the construction phase of the proposed development have the potential to directly impact the biological communities. Ex-situ effects to these Qualifying Interests (via alteration of food webs, quantity of primary producers, nutrient cycles, etc.) may occur, where suitable habitat for these Qualifying Interests occurs. <u>Disturbance</u> Although this European site is located 7.7km from the proposed development, these Qualifying Interests are mobile and may use habitats surrounding the proposed development. Individuals could be disturbed during the construction and operation of the proposed development. **Therefore, Adverse Effects cannot be excluded.**	Yes
Barnacle Goose (*Branta leucopsis*) [A045]	*"To maintain the favourable conservation condition of Barnacle Goose in Mid-Clare Coast SPA*		
Ringed Plover (*Charadrius hiaticula*) [A137]	*"To maintain the favourable conservation condition of Ringed Plover in Mid-Clare Coast SPA"*		
Sanderling (*Calidris alba*) [A144]	*"To maintain the favourable conservation condition of Sanderling in Mid-Clare Coast SPA"*		
Purple Sandpiper (*Calidris maritima*) [A148]	*"To maintain the favourable conservation condition of Purple Sandpiper in Mid-Clare Coast SPA"*		
Dunlin (*Calidris alpina*) [A149]	*"To maintain the favourable conservation condition of Dunlin in Mid-Clare Coast SPA"*		
Turnstone (*Arenaria interpres*) [A169]	*"To maintain the favourable conservation condition of Turnstone in Mid-Clare Coast SPA"*		

Qualifying Interest	Conservation Objective as per NPWS (2014d)	Do the proposed development provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Wetland and Waterbirds [A999]	*"To maintain the favourable conservation condition of the wetland habitat in Mid-Clare Coast SPA as a resource for the regularly occurring migratory waterbirds that utilise it."*	The Conservation Objective for Wetlands is defined by a single Attribute, namely *"Habitat area",* the Target for which is "*The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 4,641 hectares, other than that occurring from natural patterns of variation*". As the proposed development does not provide for any reduction in the permanent area of this habitat within this site, there is no potential for Adverse Effects on the Mid-Clare Coast SPA, in view of its Conservation Objective for this Qualifying Interest habitat. **Therefore, it can be concluded beyond reasonable scientific doubt that there is no potential for the proposed development to result in Adverse Effects.**	No

3.4 Summary of Adverse Effects

In Section 3.1, it was established that 8 European sites, namely; the Lower River Shannon SAC, the Kilkee Reefs SAC, the Tullaher Lough and Bog SAC, the Carrowmore Dunes SAC, the Carrowmore Point to Spanish Point and Islands SAC, the River Shannon and River Fergus SPA, the Illaunonearaun SPA and the Mid-Clare Coast SPA occur within the Zone of Influence of the proposed development and that there are potential pathways for effects between the proposed development and four of these European sites, namely the Lower River Shannon SAC, the River Shannon and River Fergus Estuaries SPA, the Illaunonearaun SPA and the Mid-Clare Coast SPA. No pathways for effects exist between the proposed development and any other European site.

In Section 3.3 it was established, in light of the best scientific knowledge, that the proposed development, will give rise to ecological impacts which would constitute adverse effects on four of these European sites, in view of the site's Conservation Objectives. A summary of the Qualifying Interests in the European sites likely to be affected is provided in Table 3-7 below.

Table 3-7 Summary of the European sites and the Qualifying Interests where Adverse effects could not be excluded.

European site	Qualifying Interest
Lower River Shannon SAC	Sea Lamprey (*Petromyzon marinus*) [1095] River Lamprey (*Lampetra fluviatilis*) [1099] Atlantic Salmon (*Salmo salar*) [1106] Bottlenose Dolphin (*Tursiops truncatus*) [1349] Otter (*Lutra lutra*) [1355] Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] *Salicornia* and other annuals colonizing mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
River Shannon and River Fergus Estuaries SPA	Cormorant (*Phalacrocorax carbo*) [A017] Whooper Swan (*Cygnus cygnus*) [A038] Light-Bellied Brent Goose (*Branta bernicla*) [A046] Shelduck (*Tadorna tadorna*) [A048] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Scaup (*Aythya marila*) [A062] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Knot (*Calidris canutus*) [A143] Dunlin (*Calidris alpina*) [A149] Black-Tailed Godwit (*Limosa limosa*) [A156] Bar-Tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Greenshank (*Tringa nebularia*) [A164]

European site	Qualifying Interest
	Black-headed Gull (*Larus ridibundus*) [A179] Wigeon (*Mareca penelope*) [A855] Shoveler (*Spatula clypeata*) [A857]
Illaunonearaun SPA	Barnacle Goose (*Branta leucopsis*) [A045]
Mid-Clare Coast SPA	Cormorant (*Phalacrocorax carbo*) [A017] Barnacle Goose (*Branta leucopsis*) [A045] Ringed Plover (*Charadrius hiaticula*) [A137] Sanderling (*Calidris alba*) [A144] Purple Sandpiper (*Calidris maritima*) [A148] Dunlin (*Calidris alpina*) [A149] Turnstone (*Arenaria interpres*) [A169]

4. ASSESSMENT OF ADVERSE EFFECTS

4.1 Approach to Assessment

In Section 3.0 of this NIS, potential adverse effects from the proposed development on the integrity of the Lower River Shannon SAC, the River Shannon and River Fergus Estuaries SPA, the Illaunonearaun SPA and the Mid-Clare Coast SPA were identified. In accordance with EC (2021), the identification of these effects was focussed on and limited to the Conservation Objectives of the sites concerned.

Section 4.0 provides a detailed analysis and evaluation of the adverse effects identified in Section 3.0 (as summarised in Section 3.4). In order to fully assess the implications of the proposed development for the European sites concerned, each of the potential adverse effects is evaluated with reference to the Attributes and Targets which define the Conservation Objectives of those sites.

4.2 Lower River Shannon SAC

4.2.1 Sea Lamprey and Sea Lamprey

The three lampreys species have all been observed spawning in the lower Shannon or its tributaries. Brook lamprey is entirely freshwater, while river and sea lamprey spend most of their adult lives in the sea and only migrate up rivers to spawn (Kurz and Costello, 1999).

The Attributes of the Conservation Objectives for these Qualifying Interests as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Distribution (River Lamprey) and Distribution: extent of anadromy (Sea Lamprey)
- Population structure of juveniles
- Juvenile density in fine sediment
- Extent and distribution of spawning habitat
- Availability of juvenile habitat

Distribution

As outlined in the Conservation Objectives, artificial barriers can block or cause difficulties for lampreys' upstream migration, thereby limiting the species to the lower stretches and restricting access to spawning areas (Rooney et al. 2015). The *distribution* site-specific target for Sea Lamprey is 'greater than 75% of main stem length of rivers accessible from estuary' and for River Lamprey it is 'access to all watercourses down to first order streams'.

Poorly designed culverts which do not allow passage for lamprey would impede the movement of these species. This could impact the distribution of these species.

Population Structure of Juveniles, Juvenile Density in Fine sediment, Extent and Distribution of Spawning Habitat and Availability of Juvenile Habitat

- The site-specific target for *Population structure of juveniles* 'At least three age/size groups present'.
- The site-specific target for *Juvenile density in fine sediment* 'Juvenile density at least 1/m^2 (Sea Lamprey) / 2m^2 (River Lamprey)'.
- The site-specific target for *Extent and distribution of spawning habitat* 'No decline in extent and distribution of spawning beds'.

- The site-specific target for *Availability of juvenile habitat* 'More than 50% of sample sites positive'.

The watercourses crossed by the proposed development and downstream waterbodies do not contain suitable spawning or nursery habitat for lamprey. Therefore, the proposed development will not directly impact juvenile populations or habitats directly. However, the introduction of barriers across watercourses could impact adults access to upstream habitats, thereby indirectly altering the population structure of juveniles or juvenile density.

The effects of water quality impacts associated with the proposed development are described in Section 0. Sedimentation and pollutants can alter habitat conditions and negatively impact the health of lamprey leading to a decline in their numbers.

Conclusion

In the absence of appropriate mitigation, the proposed development has the potential to adversely affect River Lamprey and Sea Lamprey in the Lower River Shannon SAC. Specifically, effects due to barriers and water quality have the potential to impact spawning habitat and population structure during instream works.

4.2.2 Atlantic Salmon (*Salmo salar*)

The Attributes of the Conservation Objectives for this Qualifying Interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Distribution: extent of anadromy
- Adult spawning fish
- Salmon fry abundance
- Out-migrating smolt abundance
- Number and distribution of redds
- Water quality

Distribution: Extent of Anadromy

The site-specific target for *distribution: extent of anadromy* is '100% of river channels down to second order accessible from estuary'.

Salmon migrate through the Shannon Estuary and may occur in Poulnasherry Bay and may migrate through its tributaries. The installation of a culvert that has not been designed to allow salmon passage would impede the movement of salmon upstream and downstream of the structure. This could impact the reproductive success of these species and have an adverse effect on this attribute.

Number and Distribution of Redds, Adult Spawning Fish, Salmon Fry Abundance Out-migrating Smolt Abundance

The site-specific target for these attributes are as follows:

- *number and distribution of redds* - 'no decline in number and distribution of spawning redds due to anthropogenic causes'.
- *adult spawning fish* - 'Conservation Limit (CL) for each system consistently exceeded'.
- *salmon fry abundance* - 'maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling'.

- *out-migrating smolt abundance* - 'no significant decline'. Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution and predation and sea lice (*Lepeophtheirus salmonis).*

The watercourses crossed by the proposed development and downstream waterbodies do not contain suitable spawning or nursery habitat for salmon. Therefore, the proposed development will not directly impact redds, spawning adults, salmon fry abundance juvenile populations or habitats directly. However, the introduction of barriers across watercourses could impact adults access to upstream habitats, thereby indirectly altering the adults access to spawning habitat, reducing juvenile population structure of juveniles or juvenile density.

There is potential for the proposed development to result in the release of pollutants or sediment. The effects of water quality impacts associated with the proposed development are described in Section 0. The reduction of water quality has the potential to negatively impact the health of Salmon and may reduce their reproductive success and/or result in mortality.

Number and Distribution of Redds

The site-specific target for *Number and distribution of redds* is 'No decline in number and distribution of spawning redds due to anthropogenic causes'.

The watercourses crossed by the proposed development and downstream waterbodies do not contain suitable spawning habitat for salmon (redds). Therefore, there is no potential for the proposed development to impact this attribute.

Water Quality

The site-specific target for *water quality* is 'at least Q4 at all sites sampled by EPA'. The effects of water quality impacts associated with the proposed development are described in Section 0.

Conclusion

In the absence of appropriate mitigation, the proposed development has the potential to adversely affect Atlantic Salmon in the Lower River Shannon SAC. Specifically, effects on water quality during construction have the potential to impact salmon health, movement and reproductive success. The culvert installation could prevent access to spawning habitat. Therefore, appropriate mitigation is required to prevent such adverse effects.

4.2.3 Bottlenose Dolphin

The Attributes and Targets for the Conservation Objective of this Qualifying Interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use
- Habitat use: critical areas - Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.
- Disturbance - Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site

The evaluation is undertaken in the following sections and carried out in accordance with the AA notes within the conservation objectives supporting documents for marine habitats for the Lower River Shannon SAC (NPWS, 2012a). The attributes and targets, and the accompanying notes provide a robust framework for assessing the potential for adverse effects on the integrity of European sites that are designated for marine mammals within the zone of influence.

Access to Suitable Habitat

The site-specific target for *access to suitable habitat* is 'species range within the site should not be restricted by artificial barriers to site use.' The AA notes are as follows:

- This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of bottlenose dolphin from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein.
- It does not refer to short-term or temporary restriction of access or range.

Dolphin habitat within Poulnasherry bay includes the areas which are permanently covered by sea water at low tide – which is a channel of sufficient depth through the centre of the bay. Much of the Mouth of the Shannon Coastal waterbody also provides suitable habitat for Dolphin. Bottlenose dolphin are likely to be present in the waterbodies adjacent to the proposed development.

This attribute relates specifically to *permanent* exclusion of access to suitable habitat. The watercourse crossing works are temporary in nature and will be carried out over a period of 16-24 months. Therefore, proposed development does not have the potential to cause permanent (or temporary) exclusion of Bottlenose Dolphin from part of its range, or to prevent access to suitable habitat within their range.

Habitat Use: Critical Areas

The site-specific target for this attribute is 'Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition'. The AA notes are as follows:

- This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) aquatic habitat used preferentially by bottlenose dolphin during the annual cycle and (b) the natural behaviour of bottlenose dolphin within such critical areas (i.e., preferred habitat).
- Operations or activities that cause displacement of individuals from a critical area (i.e. preferred habitat) or alteration of natural behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.
- Critical areas are high-value habitat used preferentially by the species within its overall range at the site and they broadly coincide with areas of steep benthic (i.e. seafloor) slope, greater depth and stronger currents.

Two critical habitat areas for dolphin occur in the main channel of the Shannon Estuary, the closest of which is 2.6km from the proposed development. The proposed development is not located in or adjacent to aquatic habitat that could be considered preferred habitat / critical habitat for Bottlenose Dolphin. Poulnasherry Bay is predominantly comprised of shallow mudflat habitat and is highly tidal, the deepest central channel of the bay may be utilised by Bottlenose dolphin. Two critical habitat areas are present within the Shannon Estuary are at a considerable distance from proposed development. Bottlenose Dolphin utilise the wider and Shannon estuary, however there is no potential for the proposed development to impact this area.

Disturbance

The site-specific target for this attribute is 'Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site. The AA notes are as follows:

- Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population of bottlenose dolphin within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species' annual cycle.
- This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which bottlenose dolphins depend. In the absence of complete knowledge on the species' ecological requirements in this site, such considerations should be assessed where appropriate on a case-by-case basis.
- Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the bottlenose dolphin population at the site

Given that the proposed development will primarily be constructed on land and that the watercourse crossings are of small streams which are not suitable for Bottlenose Dolphin to access, there is no potential for underwater noise from the construction works to impact this species within the site, as works within the watercourse crossings will not contribute to underwater noise as it cannot propagate within the small streams. Any noise would be indetectable to Bottlenose Dolphin within the site. There is no potential for these works to exceed thresholds to cause Permanent Threshold Shift (PTS), temporary (Temporary Threshold Shift (TTS) or behavioural change to Bottlenose Dolphin at any distance.

Conclusion

The proposed development does not have the potential to adversely affect the Conservation Objective for Bottlenose Dolphin in the Lower River Shannon SAC.

4.2.4 European Otter (*Lutra lutra*)

The Attributes and Targets for the Conservation Objective of this Qualifying Interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Distribution - No significant decline
- Extent of marine habitat - No significant decline. Area mapped and calculated as 4,461.6ha
- Extent of freshwater (river) habitat - No significant decline. Length mapped and calculated as 500.1km
- Extent of freshwater (lake/lagoon) habitat - No significant decline. Area mapped and calculated as 125.6ha
- Couching sites and holts - No significant decline
- Fish biomass available - No significant decline
- Barriers to connectivity - No significant increase

Distribution

Given the scale of the proposed development, the low quality surrounding terrestrial habitats and the abundant aquatic habitat neither the construction nor the operation of the proposed development has the potential to cause a significant decline in the distribution of otters across the Lower River Shannon SAC.

Aquatic Habitats and Couching Sites and Holts

No Otter holts or couching sites were identified within 150m of the proposed development. The proposed development will not result in any loss of aquatic habitats such as marine, river, lagoon or lake habitats. Therefore, there is no potential for adverse effects to the Conservation Objective for this Qualifying Interest in regards to these Attributes.

Terrestrial Habitats

The site-specific target for this attribute is No significant decline. Area mapped and calculated as 596.8ha above high-water mark (HWM); 958.9ha along river banks/ around ponds. The notes for this attribute specify this area includes the 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters.

The proposed development partly overlaps with the 10m terrestrial buffer around the high watermark at a number of locations, however these areas are not considered to be valuable habitat for otter as they contain highly modified habitat. The areas of overlap with the 10m buffer around the HWM include the former railway line which is poorly vegetated, agricultural fields with little vegetation, on existing roads or some linear habitat features. This overlap does not remove any valuable otter habitat such as riparian vegetation or dense coverage. Given that these areas are already highly modified the conversion of these areas to the proposed development will not be a significant loss of terrestrial habitat for Otter. Therefore, there is no potential for adverse effects to the Conservation Objective for this Qualifying Interest in regards to this Attribute.

Barriers to Connectivity

The installation of new watercourse crossings, as well as fencing, and site clearance could prevent Otter from utilising watercourses crossed by the proposed development and from accessing habitats in the wider area, and could potentially sever otter territory. Otter will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed. Noise, light, and visual disturbance could result in Otter avoiding the area during construction, preventing them from accessing or utilising the habitats in the surrounding area. Watercourses will remain accessible for otter during operation. However, fencing along the length of the proposed development could prevent Otter from accessing supporting terrestrial habitat. Increased human activity and the presence of dogs along the greenway could cause disturbance to otter, which may alter foraging habits, commuting routes and habitat utilisation. These impacts could undermine the conservation objectives of the SAC for Otter with regard to barriers to connectivity.

Fish Biomass Available

The site-specific target for *fish biomass available* is 'no significant decline'. Broad diet that varies seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013). Changes to water quality can impact fish populations.

The effects of water quality impacts associated with the proposed development are described in Section 0. Sedimentation and pollutants can alter habitat conditions and negatively impact the health of fish leading to a decline of available prey for otter.

Conclusion

In the absence of mitigation, the proposed development provides for adverse effects on the integrity of the Lower River Shannon SAC, in view of its Conservation Objectives for Otter. These effects include water quality impacts during construction and barriers to connectivity. Therefore, mitigation is required in order to prevent such effects.

4.2.5 Mudflats and Sandflats not Covered by Seawater at Low Tide [1140]

Site Synopsis description of this habitat: "Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (Zostera sp.) beds and patches of green algae (e.g. Ulva sp. and Enteromorpha sp.). The main macro-invertebrate community which has been noted from the inner Shannon and Fergus estuaries is a Macoma Scrobicularia-Nereis community."

The Attributes of the Conservation Objective for this Qualifying Interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Habitat area
- Community distribution

The evaluation is undertaken in the following sections and carried out in accordance with the AA notes within the conservation objectives supporting documents for marine habitats for the Lower River Shannon SAC (NPWS, 2012a). The attributes and targets, and the accompanying notes provide a robust framework for assessing the potential for adverse effects on the integrity of European sites that are designated for marine habitats within the zone of influence.

Habitat Area

The site-specific target for this attribute is 'the permanent habitat area is stable or increasing, subject to natural processes'.

This target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area. It does not refer to long- or short-term disturbance of the biology of a site.

This Qualifying Interest occurs in this European site immediately adjacent to the proposed development. There will be no works undertaken in this habitat and there will be no land-take of this habitat for the purposes of the proposed development. Therefore, neither the construction nor the operation of the proposed development will lead to any adverse effects in terms of changes to the habitat area of this habitat.

Community Distribution

The site-specific target for this attribute is 'Conserve the following community types in a natural condition: Intertidal sand with *Scolelepis squamata* and *Pontocrates sp.* community; and Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex'.

The estimated areas of the communities within the Mudflats and sandflats not covered by seawater at low tide habitat given below are based on spatial interpolation and therefore should be considered indicative:

- Intertidal sand with Scolelepis squamata and Pontocrates sp. community – 213ha.
- Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex – 8596ha.

Significant continuous or ongoing disturbance of communities should not exceed an approximate area of 15% of the interpolated area of each community type, at which point an inter-Departmental management review is recommended prior to further licensing of such activities.

Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing source of disturbance over time and space may be assessed in a context-specific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.

The effects of water quality impacts associated with the proposed development are described in Section 0. An accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially impact invertebrate communities downstream by increased sedimentation, nutrient overloading which could reduce coverage and density.

Conclusion

In the absence of appropriate mitigation, the construction of the proposed development has the potential to adversely affect the Conservation Objective for 'Mudflats and sandflats not covered by seawater at low tide' of the Lower River Shannon SAC through impacts on water quality which may affect the water chemistry, community structure and composition of this Qualifying Interest. Therefore, mitigation is required to avoid these adverse effects.

4.2.6 Large Shallow Inlets and Bays [1160]

Site Synopsis description for this habitat: "The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top, and below this each of the shores has different characteristic species giving a range of different shore types."

The Attributes of the Conservation Objective for both this qualifying interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- Habitat area
- Community distribution

Habitat Area

The site-specific target for this attribute is: 'The permanent habitat area is stable or increasing, subject to natural processes.'

- This habitat also encompasses the Annex I habitats, Mudflats and sandflats not covered by water at low tide, Sandbanks which are slightly covered by sea water all the time and Reefs. Targets for these habitats should be addressed in their own right.
- This target refers to activities or operations that propose to permanently remove habitat from the site, thereby reducing the permanent amount of habitat area. It does not refer to long- or short-term disturbance of the biology of a site.

The proposed development route is located along the former railway line adjacent to the boundary of this European site. This habitat is present within Poulnasherry Bay, adjacent to the proposed development. The proposed development will not be built into this habitat and does not provide for any reduction in the permanent area of this habitat.

Community Distribution

The site-specific target for this attribute is: 'Conserve the following community types in a natural condition: Intertidal sand with *Scolelepis squamata* and *Pontocrates sp*. community; Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Subtidal sand to mixed sediment with *Nucula nucleus* community complex; Subtidal sand to mixed sediment with Nephtys sp. community complex; Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone- dominated subtidal reef community; and Laminaria-dominated community complex.'

- The estimated areas of the communities given below are based on spatial interpolation and therefore should be considered indicative: - Intertidal sand with *Scolelepis squamata* and *Pontocrates sp*. community - 211ha - Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex – 466ha - Subtidal sand to mixed sediment with *Nucula nucleus* community complex – 6095ha - Subtidal sand to mixed sediment with *Nephtys sp*. community complex – 9431ha - Fucoid-dominated intertidal reef community complex – 616ha - Mixed subtidal reef community complex – 7464ha - Faunal turf-dominated subtidal reef – 8710ha - Anemone-dominated subtidal reef community – 34ha - Laminaria-dominated community complex - 2221ha
- Significant continuous or ongoing disturbance of communities should not exceed an approximate area of 15% of the interpolated area of each community type, at which point an inter-Departmental management review is recommended prior to further licensing of such activities.
- Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing source of disturbance over time and space may be assessed in a context-specific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.

This habitat is immediately adjacent to the proposed development in Poulnasherry Bay. The effects of water quality impacts associated with the proposed development are described in Section 0. An accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially impact invertebrate or algal communities by increased sedimentation or nutrient overloading which could reduce coverage and density.

Conclusion

In the absence of appropriate mitigation, the construction of the proposed development has the potential to adversely affect the Conservation Objective for 'large shallow inlets and bays' of the Lower River Shannon SAC through impacts on water quality which may affect the community distribution of this Qualifying Interest. Therefore, mitigation is required to avoid these adverse effects.

4.2.7 Reefs [1170]

The Attributes and Targets of the Conservation Objective for this qualifying interest as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- **Habitat distribution** - The distribution of Reefs is stable, subject to natural processes.
- **Habitat area** - The permanent habitat area is stable, subject to natural processes.

- **Community distribution** - Conserve the following reef community types in a natural condition: Fucoid-dominated intertidal reef community complex; Mixed subtidal reef

community complex; Faunal turf-dominated subtidal reef community; Anemone-dominated subtidal reef community; and Laminaria- dominated community complex.

Habitat Distribution

The site-specific target for this Attribute is "The distribution of Reefs is stable, subject to natural processes."

- This target refers to activities or operations that propose to permanently remove reef habitat, thus reducing the range over which this habitat occurs within the site. It does not refer to long- or short-term disturbance of the biology of reef habitats.

The proposed development route is located along the former railway line adjacent to the boundary of this European site. This habitat is present within Poulnasherry Bay, adjacent to the proposed development. The proposed development will not be built into this habitat and does not provide for any changes in the distribution of this habitat.

Habitat Area

The site-specific target for this Attribute is "The permanent habitat area is stable, subject to natural processes." This target refers to activities or operations that propose to permanently remove habitat from the site, thereby reducing the permanent amount of habitat area. It does not refer to long- or short-term disturbance of the biology of a site.

The proposed development is located along the former railway line adjacent to the boundary of this European site. This habitat is present within Poulnasherry Bay, adjacent to the proposed development. The proposed development will not be built in the intertidal or subtidal areas and does not provide for any reduction in the permanent area of this habitat.

Community Distribution

The site-specific target for this Attribute is "Conserve the following reef community types in a natural condition: Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone- dominated subtidal reef community; and Laminaria- dominated community complex."

The estimated areas of the communities within the Reefs habitat given below are based on spatial interpolation and therefore should considered indicative: - Fucoid-dominated intertidal reef community complex - 1294ha - Mixed subtidal reef community complex - 7464ha - Faunal turf-dominated subtidal reef community - 9692ha - Anemone-dominated subtidal reef community – 747ha - Laminaria-dominated community complex – 2224ha.

- This target relates to the structure and function of the reef and therefore it is of relevance to those activities that may cause disturbance to the ecology of the habitat.
- Significant continuous or ongoing disturbance of communities should not exceed an approximate area of 15% of the interpolated area of each community type, at which point an inter-Departmental management review is recommended prior to further licensing of such activities.
- Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing source of disturbance over time and space may be assessed in a context-specific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.

The proposed development does not involve any physical disturbance to reef habitat, and it will not cause any direct change in the structure or composition of any such vegetation, e.g.,

through works within the habitats. However, a reduction in water quality (as detailed in Section 0) through pollution or input of organic material (dog waste) could create degrade the habitat and result in nutrient enrichment, leading to changes in community composition. It is unlikely that changes in water quality from the proposed development will result in changes of sufficient scale to impact upon 15% of a community type, due to the very large size of the SAC, the small size of the proposed development and the temporary nature of the construction works. The input of nutrients via dog waste is considered to be a permanent source of disturbance. However, these impacts cannot be quantified and therefore are considered to have the potential to cause adverse effects.

Conclusion

In the absence of appropriate mitigation, the construction of the proposed development has the potential to adversely affect the Conservation Objective for 'reefs' of the Lower River Shannon SAC through impacts on water quality which may affect the community distribution of this Qualifying Interest. Therefore, mitigation is required to avoid these adverse effects.

4.2.8 Salt Marsh Habitats: Salicornia and Other Annuals Colonising Mud and Sand' [1310], 'Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)' [1330] and 'Mediterranean Salt Meadows' [1410]

Site Synopsis description for these habitats: "Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (Carex extensa), Lesser Sea-spurrey (*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus estuary: a type of robust saltmarsh-grass (*Puccinellia foucaudii*), sometimes placed within the species Common Saltmarsh-grass (*P. maritima*) and Hard-grass (*Parapholis strigosa*).

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of Common Cord-grass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (*Salicornia europaea agg*.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (Phragmites australis) and club-rushes (*Scirpus maritimus, S. tabernaemontani* and *S. triquetrus*). In addition to the nationally rare Triangular Club-rush (*Scirpus triqueter*), two scarce species are found in some of these creeks (e.g. *Ballinacurra Creek*): Lesser Bulrush (*Typha angustifolia*) and Summer Snowflake (*Leucojum aestivum*)."

The Attributes and Targets of the Conservation Objectives for salt marsh habitats as per the Lower River Shannon SAC (NPWS, 2012a) are summarised as follows:

- **Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession, for all saltmarsh habitats.
    - For sub-site areas mapped for Salicorna [1310], Atlantic salt meadows: and Mediterranean salt meadows in (NPWS, 2012a). However, further un-surveyed areas may be present within the site for each habitat type.
- **Habitat distribution** - No decline, or change in habitat distribution, subject to natural processes (all saltmarsh habitats).

- **Physical structure: sediment supply** - Maintain natural circulation of sediments and organic matter, without any physical obstructions (all saltmarsh habitats).
- **Physical structure: creeks and pans** - Maintain creek and pan structure, subject to natural processes, including erosion and succession (all saltmarsh habitats).
- **Physical structure: flooding regime** - Maintain natural tidal regime (all saltmarsh habitats).
- **Vegetation structure: zonation** - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession (all saltmarsh habitats).
- **Vegetation structure: vegetation height** - Maintain structural variation within sward (all saltmarsh habitats).
- **Vegetation structure: vegetation cover** - Maintain more than 90% of the saltmarsh area vegetated (all saltmarsh habitats).
- **Vegetation composition: typical species and sub-communities** - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009) (all saltmarsh habitats).
- **Vegetation structure: negative indicator species- Spartina anglica** - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% (all saltmarsh habitats).

Habitat Area

The site-specific target for this Attribute is "Area stable or increasing, subject to natural processes, including erosion and succession", for all saltmarsh habitats for the areas mapped and for unknown areas.

The proposed development boundary overlaps several small areas indicated as Atlantic salt meadows [1330] and Mediterranean salt meadow [1410] habitats from the Article 17 mapping (NPWS, 2019b). No areas of salicornia habitat [1310] occur near the proposed development, the closest occurrence is at Querrin, 4km away. Each instance of overlap is detailed below with the extent of overlap and details of the habitats present as recorded during the field surveys. In summary these areas which overlap with the red line boundary of the proposed development do not contain saltmarsh habitats and due to minor errors in the mapping of the saltmarsh habitat areas in the Article 17 reports, therefore the proposed development will not result in any loss of salt marsh habitats.

1. Ch. 10+050 over a distance of 10m. Article 17 data indicate that [1330] and [1410] habitats are present at this location. The proposed development is within an agricultural field at this location, separated from the adjacent tidal area by a drainage ditch and hedgerow. Part of the indicated salt marsh habitats are within the former railway corridor as it bridges the bay at this location. There are no saltmarsh habitats within the proposed development boundary.
2. Ch. 8+850 over a distance of 143m. Article 17 data indicate that [1330] and [1410] habitats are present at this location. The proposed development is within the former railway corridor at this location. This habitat is improved grassland (GA1) on a ballast base, the railway corridor is elevated above the surrounding salt marsh habitats. The proposed development will be built entirely within the former railway track, there will be no works within any salt marsh habitats.

3. Ch 8+100 over a distance of 40m. Article 17 data indicate that [1330] and [1410] habitats are present at this location. This location is the railway lands at Moyasta – this is a large area of hardstanding which has been partially recolonised. The area is elevated above

the surrounding bay and does not have a tidal influence. No saltmarsh habitats are present within the proposed development boundary at this location, they are present within the bay adjacent to the raised area.

4. Ch 7+650 over a distance of 56m. Article 17 data indicate that [1330] and [1410] habitats are present at this location. The proposed development is within the former railway corridor at this location excluding the proposed farm access. The proposed farm access is partially within the existing farm access (comprising recolonising bare ground) and partially within GS4 wet grassland habitat. No saltmarsh habitats are present within the proposed development boundary at this location.
5. Ch 7 + 200 over a distance of 58m. Article 17 data indicate that [1330] habitat is present at this location. The proposed development is within the former railway corridor at this location. The area of overlap was mapped as GS2 dry meadows and grassy verges during the site surveys with the majority of the corridor containing scrub habitat, the adjacent area was mapped as CM2 upper salt marsh. Salt marsh habitat is present adjacent to the proposed development but there is no overlap with this habitat and it will not result in the direct loss of this habitat.

The proposed development is in close proximity to salt marsh habitats along much of its length, however it has been specifically designed to avoid any salt marsh habitats. Therefore, the proposed development will not result in any physical impacts to the adjacent habitats. As the proposed development is entirely located above the high tide mark and in highly modified habitats (former railway line), and retains existing barriers to the bay, it will not alter any physical attributes of these habitats including natural processes of erosion and succession.

Habitat Distribution

The site-specific target for this attribute is 'No decline, or change in habitat distribution, subject to natural processes', for all saltmarsh habitats.

As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or in alterations to these habitats which may result in a change in distribution of this habitat.

Physical Structure: Sediment Supply

The site-specific target for this attribute is 'Maintain natural circulation of sediments and organic matter, without any physical obstructions', for all saltmarsh habitats.

As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or in alterations to these habitats which may result in a change to the natural circulation of sediments and organic matter, without any physical obstructions to this habitat.

The watercourses which enter Poulnasherry Bay are small streams and drainage ditches which do not carry large amounts of sediment into the bay. The primary source of sediment input and circulation in the bay is due to the tide. The culverts and structures over these watercourses do not have the potential to alter sediment supply to the bay.

However, a reduction in water quality (as detailed in Section 0) through pollution could create degrade the habitat, leading to changes in the physical structure. Given the dilution capacity of the coastal waterbodies and the extent of the buffer zones between the greenway and the receiving waterbodies the effects during the operational phase on the coastal waterbody are unlikely. The significance of the effects on the water quality of receiving waterbodies are assessed as being imperceptible and of temporary duration.

Physical Structure: Creeks and Pans

The site-specific target for this attribute is 'Maintain creek and pan structure, subject to natural processes, including erosion and succession', for all saltmarsh habitats.

As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or in alterations to these habitats which may result in a change in creek and pan structure, subject to natural processes, including erosion and succession.

Physical Structure: Flooding Regime

The site-specific target for this attribute is 'Maintain natural tidal regime', for all saltmarsh habitats. As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or in alterations to these habitats which could result in a change in flooding regime of this habitat.

Vegetation Structure: Vegetation Height

The site-specific target for this attribute is 'Maintain structural variation within sward', for all saltmarsh habitats. The proposed development does not involve any physical disturbance to saltmarsh habitats, and it will not cause any direct change in the structure or composition of any such vegetation, e.g., by clearing vegetation, encouraging grazing, removing characteristic species. However, a reduction in water quality (as listed in Section 0) through pollution could create degrade the habitat, leading to changes in vegetation composition.

Vegetation Structure: Vegetation Cover

The site-specific target for this attribute is 'Maintain more than 90% of the saltmarsh area vegetated, for all saltmarsh habitats. As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or direct impacts to these habitats, however, potential water quality impacts could cause habitat degradation leading to changes in vegetation cover.

Vegetation Composition: Typical Species and Sub-Communities

The site-specific target for this attribute is 'Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)', for all saltmarsh habitats. As detailed above, the proposed development is in close proximity to saltmarsh habitats but will not result in any physical changes or direct impacts to these habitats, however, potential water quality impacts could cause habitat degradation leading to changes in vegetation cover.

Japanese knotweed is present along the proposed development. The movement of machinery and personnel to and from the proposed development and works on watercourses culvert creates the risk of the spread of invasive plant materials and seeds to the habitats within the proposed development and beyond it. If invasive species propagules are present on construction machinery, they could inadvertently be spread to the habitats adjacent to the proposed development. Japanese knotweed could outcompete and shade-out native vegetation or cause instability of substrate, this may alter the species composition of these Qualifying Interest habitats.

Vegetation Structure: Negative Indicator Species- Spartina anglica

The site-specific target for this attribute is 'No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%', for all saltmarsh habitats.

Common cordgrass was not recorded during the site surveys and is not present within the proposed development boundary. No works will be carried out beyond the proposed development boundary or within the mudflat and saltmarsh habitats, propagules of this plant will not be caused to spread. Common Cordgrass is known to be present elsewhere within the SAC, this species spreads by seeds and Rhizomes which may naturally spread into the areas adjacent to the proposed development. However, spread will not be caused as a result of the proposed development as there will be no works in intertidal areas. The proposed development does not have the potential to cause expansion of negative indicator species.

Conclusion

In the absence of appropriate mitigation, the construction of the proposed development has the potential to adversely affect the Conservation Objective for 'Salicornia and other annuals colonising mud and sand', 'Atlantic salt meadows' and 'Mediterranean salt meadows' of the Lower River Shannon SAC through impacts on water quality and spread of Japanese Knotweed which may affect the vegetation structure and composition of these Qualifying Interests. Therefore, mitigation is required to avoid these adverse effects.

4.3 River Shannon and River Fergus Estuaries SPA

The site synopsis describes this site as "the most important coastal wetland site in the country". The Qualifying Interests for the site are all wintering species, apart from Cormorant for which the breeding population is the Qualifying Interest, and 'Wetlands and waterbirds'.

Wintering Birds

The Conservation Objectives for the Qualifying Interests that are wintering species are defined by the following Attributes and Targets:

- Population trend - The site-specific target is 'long term population trend stable or increasing'
- Distribution - The site-specific target is 'no significant decrease in the range, timing or intensity of use of areas by [the Qualifying Interest species], other than that occurring from natural patterns of variation'.

The wintering Qualifying Interest species for this site are:

- Whooper Swan (Cygnus cygnus) [A038]
- Light-Bellied Brent Goose (Branta bernicla) [A046]
- Shelduck (Tadorna tadorna) [A048]
- Teal (Anas crecca) [A052]
- Pintail (Anas acuta) [A054]
- Scaup (Aythya marila) [A062]
- Ringed Plover (Charadrius hiaticula) [A137]
- Golden Plover (Pluvialis apricaria) [A140]
- Grey Plover (Pluvialis squatarola) [A141]
- Lapwing (Vanellus vanellus) [A142]
- Knot (Calidris canutus) [A143]

- Dunlin (Calidris alpina) [A149]
- Black-Tailed Godwit (Limosa limosa) [A156]
- Bar-Tailed Godwit (Limosa lapponica) [A157]
- Curlew (Numenius arquata) [A160]
- Redshank (Tringa totanus) [A162]
- Greenshank (Tringa nebularia) [A164]
- Black-headed Gull (Larus ridibundus) [A179]
- Wigeon (Mareca penelope) [A855]
- Shoveler (Spatula clypeata) [A857]

Population trend, Distribution

The potential impacts and mechanisms of impacts to wintering birds are described in Section 2.5. Given the significant numbers of qualifying interest species surrounding the proposed development, their sensitivity to disturbance and long-term national population declines of many species, there is potential for the proposed development (in the absence of mitigation) to cause significant levels of disturbance and therefore could contribute to the declining populations trends of these species. This would delay the achievement of the Conservation Objectives for the site.

Visual disturbance during the construction or operational phases of the proposed development (in the absence of mitigation) could lead to wintering birds altering their use of the parts of the site to avoid the disturbance. This could result in the birds using suboptimal roosting or feeding habitats altering the distribution within the site. This would delay the achievement of the Conservation Objectives for the site.

Noise disturbance from the greenway users will be limited to the area within 20m of the greenway route (see Section 2.5.3.5). This is the area where noise would be above the disturbance threshold for wintering birds (70dB). Normal conversations do not exceed the disturbance threshold and therefore do not have the potential to cause disturbance. A person or children shouting exceeds this threshold up to c.5m from the source. A dog barking would exceed the threshold up to 20m distance from the source.

On the surveys undertaken between 2021 and 2026, 315 birds were recorded within 20m of the greenway. This is <1% of the 35,000 birds recorded over the course of the surveys. Birds within 20m of the greenway were recorded on 35 occasions in total, with 28 of the 35 records being of ten birds or less. 288 of the 315 birds recorded were inside the sensitive bird areas, and of these 263 are Qualifying Interests of the River Shannon and River Fergus Estuaries SPA. The highest records were one group of 52 Lapwing in 2021, groups of 42 and 37 Curlew spread out over mudflats in 2026, a group of 37 Wigeon in 2026, a group of 32 Black-Headed Gull in 2021 and a group of 17 Curlew in 2022. Therefore, 99% of birds occur at a distance beyond the area which could be impacted by noise above background levels. The distribution of birds in the sensitive bird areas is presented in Appendix E.

Greenshank was recorded in significant numbers, with a peak count of a single individual on two occasions. This is due to the SPA population for Greenshank being very small, with any observations of an individual greenshank being >1% of the SPA population.

Noise generated from the greenway during the operational phase will not lead to an adverse effect for the following reasons:

- Disturbance could only occur where people and/or dogs were in the same area as birds that were within 20m of the greenway, which the data shows is unlikely.
- The numbers of visitors to the greenway during the winter months is very low, and based on existing greenway data, just 8.6% of greenway visitors are dog walkers.
- In this situation, the dog would have to bark to illicit a disturbance response in birds out to 20m.

Single disturbances events do not necessarily have a significant impact on a birds foraging time or energy demand and would likely have a negligible impact on the bird (Goss-Custard et al., 2019). Given the very low likelihood of disturbance occurring due to noise, this is not considered to have the potential to result in adverse effects on the population trends or distribution of birds in the SPA.

An accidental pollution event during construction (as described in Section 0) could affect surface water downstream in the estuary. A reduction in water quality or increased sedimentation could degrade the habitat quality and impact food availability for these Qualifying Interests. This could lead to reduced feeding success and reduced condition of individuals which may lead to these species abandoning or altering use of this site, or species mortality. This would delay the achievement of the Conservation Objectives for the site.

The increased height barrier and wall at Moyasta Bridge could introduce a raptor hunting perch and could increase raptor predation on foraging or roosting waterbirds in the surrounding mudflats and salt marshes. This could directly reduce the populations through predation, or indirectly alter wintering birds distribution in the surrounding habitats due to increased predation risk or perceived predation risk. This would delay the achievement of the Conservation Objectives for the site.

Conclusion

In the absence of appropriate mitigation, the construction and operation phases of the proposed development have the potential to adversely affect the Conservation Objectives for the wintering bird species that are Qualifying Interests in the River Shannon and River Fergus SPA through disturbance, impacts to water quality, which could affect their population trends and distribution in the site.

Cormorant

- Breeding population abundance: apparently occupied nests (AONs) – No significant decline
- Productivity rate – No significant decline
- Distribution: breeding colonies – No significant decline
- Prey biomass available – No significant decline
- Barriers to connectivity – No significant increase
- Disturbance at the breeding site - Human activities should occur at levels that do not adversely affect the breeding cormorant population

There are no breeding colonies of cormorant nearby the proposed development, or suitable habitat to support breeding colonies (coastal cliffs, rocky islands, large trees). There is no potential to cause disturbance to nesting cormorant. Therefore, there is no potential for the proposed development to impact colonies directly and affect the attributes: distribution: breeding colonies, barriers to connectivity, disturbance at the breeding site.

An accidental pollution event during construction (as described in Section 0) could affect surface water downstream in the estuary. A reduction in water quality or increased sedimentation could degrade the habitat conditions and impact food availability for breeding Cormorant. This could lead to direct impacts to prey biomass available thereby reducing foraging success and reduced condition of individuals which may lead to lower breeding population abundance or productivity rate.

Conclusion

In the absence of appropriate mitigation, the construction and operational phases of the proposed development have the potential to adversely affect the Conservation Objectives for the breeding Cormorant in the River Shannon and River Fergus Estuaries SPA through impacts to water quality, which could affect prey biomass available, productivity rate and breeding population abundance.

Wetlands and waterbirds

The site has vast expanses of intertidal mudflats which contain a diverse macroinvertebrate community, e.g. *Macoma-Scrobicularia-Nereis*, which provides a rich food resource for wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.

The Attributes of this Conservation Objective as per the River Shannon and River Fergus SPA (NPWS, 2012e) is *wetland habitat area.*

Wetland Habitat Area

The site-specific target is 'the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261hectares, other than that occurring from natural patterns of variation'.

The proposed development will be built entirely above the high tide mark. The proposed development will not lead to the loss of wetland habitats for wintering birds. An accidental pollution event during construction (as described in Section 0) could affect surface water downstream in the estuary. A reduction in water quality could alter the wetland conditions of the habitat used by wintering birds in Poulnasherry Bay. Therefore, mitigation is required to avoid these adverse effects.

Conclusion

In the absence of appropriate mitigation, the construction and operation phase of the proposed development has the potential to adversely affect the Conservation Objectives for Wetlands in the River Shannon and River Fergus Estuaries SPA through impacts on water quality, both of which could affect the vegetation and fauna in the wetlands that form foraging and roosting sites for the wintering bird species of the SPA.

4.4 Illaunonearaun SPA

4.4.1 Barnacle Goose

This SPA is designated for one Qualifying Interest, Barnacle Goose. In Ireland, Barnacle Goose winters on remote islands in the northwest Ireland where it is relatively free from disturbance. Barnacle Geese are highly site-faithful (Phillips et al., 2003). Regular monitoring of the population between 1959 and 2018 indicates that the vast majority of the population are

found on the north-west coast with smaller numbers in Clare (Doyle et al, 2018) and in inland areas.

The Attributes and Targets for of this Conservation Objective are:

- Winter population trend: Long term winter population trend is stable or increasing.
- Winter spatial distribution: Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
- Barriers to connectivity and site use: Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
- Forage spatial distribution, extent and abundance: Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
- Roost spatial distribution and extent: Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.
- Supporting habitat: area and quality: Sufficient area of utilisable habitat available in ecologically important sites outside the SPA.

Winter Population Trend

The site-specific target is “Long term winter population trend is stable or increasing”.

The national population of wintering Barnacle Goose in Ireland has increased by 102% from 1993 - 2018 (Lewis et al., 2019) as monitored by the International Census of Greenland Barnacle Goose. The baseline population number for the site is 250 individuals. More recent data showed a population of 224 Barnacle Goose used Illaunonearaun SPA and the Mid-Clare Coast SPA during the period 2013 - 2023 (4 year mean of census survey counts from the International Census of Greenland Barnacle Goose). This represents a population decrease of 10% since the baseline period, in contrast to the national trend. Barnacle Goose was not recorded in Poulnasherry Bay or the surrounding area during any of the wintering bird surveys carried out for the proposed development, or in surveys for the Strategic Integrated Framework Plan (SIFP), or IWeBS surveys. As this species is highly unlikely to occur in Poulnasherry Bay, there is no potential for the proposed development to cause a decrease in the wintering population trend at the Illaunonearaun SPA.

Winter Spatial Distribution

The site-specific target is "Sufficient area and availability (in terms of timing and intensity of use) of suitable habitat to support the population target". Given this species has high site-fidelity to wintering, foraging and roosting grounds and that there are no records of this species surrounding the proposed development, it is highly unlikely that this species utilises the habitats surrounding the proposed development. Therefore, there is no potential for the proposed development to reduce the area or availability of suitable habitat for this species.

Disturbance at Wintering Site

The site-specific target is "Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution". For the reasons outlined above under 'winter spatial distribution', it is highly unlikely that this species utilises the habitats surrounding the proposed development. Therefore, there is no potential for the proposed development to cause disturbance of this species.

Barriers to Connectivity and Site Use

The site-specific target is "Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA". The proposed development is not located in habitat ecologically important to this species and does not form a barrier to use of this site.

Forage Spatial Distribution, Extent and Abundance

The site-specific target is "Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target". Birds are highly likely to exhibit foraging site fidelity and may be found foraging on offshore islands as well as commuting to forage on the mainland. Maximum foraging distance is approximately 7km for wintering birds (Doyle et al., 2023). The proposed development is 6.5 km from the SPA at its most western extent in Kilkee. Given that the proposed development is at almost the maximum foraging distance for the species, and that it has not been recorded during any of the wintering surveys and it has high site-fidelity it is highly unlikely that this species utilises the habitats surrounding the proposed development. Therefore, there is no potential for the proposed development to impact foraging locations of Barnacle Geese.

Roost Spatial Distribution and Extent

The site-specific target is "Sufficient number of locations, area and availability of suitable roosting habitat to support the population target". When roosting, this species uses open habitats (primarily pastures) that provide wide sightlines for the birds and which are typically adjacent to water bodies; thus, offshore islands are commonly used (NPWS, 2024). The proposed development does not provide suitable roosting habitat for this species.

Supporting Habitat: Area and Quality

The site-specific target is "Sufficient area of utilisable habitat available in ecologically important sites outside the SPA". For the reasons outlined above under 'forage spatial distribution, extent and abundance', it is highly unlikely that this species utilises the habitats surrounding the proposed development. Therefore, there is no potential for the proposed development to impact utilisable habitat in ecologically important sites outside of the SPA.

Conclusion

For the reasons outlined above, there is no potential for the proposed development to result in adverse effects on the integrity of the Illaunonearaun SPA.

4.5 Mid-Clare Coast SPA

The Qualifying Interests for the site are all wintering species, apart from Cormorant, for which the breeding population is the Qualifying Interest.

4.5.1 Wintering Birds

The Qualifying Interest species for this site that are wintering birds are:

- Barnacle Goose (*Branta leucopsis*) [A045]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Sanderling (*Calidris alba*) [A144]
- Purple Sandpiper (*Calidris maritima*) [A148]
- Dunlin (*Calidris alpina*) [A149]
- Turnstone (*Arenaria interpres*) [A169]

The Attributes and Targets for of the Conservation Objectives for these Qualifying Interests are:

- Population trend - The site-specific target for *population trend* is 'long term population trend stable or increasing'
- Distribution - 'no significant decrease in the range, timing or intensity of use of areas by [the Qualifying Interest species], other than that occurring from natural patterns of variation'.

As detailed above for the Illaunonearaun SPA, there is no potential for the proposed development to result in adverse effects on Barnacle Goose.

Purple sandpiper is a localised winter visitor in Ireland with a population of around 300 birds in Quilty Co. Clare (BirdWatch Ireland, 2025) and are reported along Clare's western coastline. Purple Sandpiper was not recorded during any of the wintering bird surveys carried out for the proposed development, or in surveys for the Strategic Integrated Framework Plan (SIFP) or IWeBS surveys. As this species is highly unlikely to occur within the Shannon and Fergus Estuaries or Poulnasherry Bay, there is no potential for the proposed development to affect these species.

The other Qualifying Interest species namely (Ringed Plover, Sanderling, Dunlin and Turnstone) occur regularly in Poulnasherry bay. The populations of the Mid-Clare Coast SPA may also utilise the coastal habitats adjacent to the proposed development. These species are vulnerable to the same impacts as those outlined for the wintering bird populations of the River Shannon and River Fergus Estuaries SPA. These impacts include disturbance and impacts to water quality, which could affect the species population trends and distribution in the site.

Conclusion

For the reason outlined above, there is no potential for the proposed development to result in any impacts to Barnacle Goose or Purple Sandpiper, however there is potential for adverse effects on Ringed Plover, Sanderling, Dunlin and Turnstone.

4.5.2 Cormorant

The Attributes and Targets for of the Conservation Objective for breeding Cormorant as per the Mid-Clare Coast SPA (NPWS, 2014d) are as follows:

- Breeding population abundance: apparently occupied nests (AONs) – No significant decline
- Productivity rate – No significant decline
- Distribution: breeding colonies – No significant decline
- Prey biomass available – No significant decline
- Barriers to connectivity – No significant decline
- Disturbance at the breeding site -Human activities should occur at levels that do not adversely affect the breeding cormorant population.

There are no breeding colonies of Cormorant nearby the proposed development, or suitable habitat to support breeding colonies (coastal cliffs, rocky islands, large trees). Mattle Island is a traditional breeding colony in this SPA, which is 13km north of the proposed development. There is no potential to cause disturbance to nesting cormorant. Therefore, there is no potential for the proposed development to impact colonies directly and affect the attributes: distribution: breeding colonies, barriers to connectivity, disturbance at the breeding site.

Conclusion

There is no potential for adverse effects on Cormorant.

4.5.3 Wetlands

The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. Macoma-Scrobicularia-Nereis, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.

The Attributes of this Conservation Objective as per the River Shannon and River Fergus SPA (NPWS, 2014d) is *wetland habitat area.*

Wetland Habitat Area

The site-specific target is 'the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 4,641 hectares, other than that occurring from natural patterns of variation'.

This European site is located at least 7.7km north of the proposed development and therefore there is no potential for the proposed development to result in any impacts or loss of habitat area, or to cause a change in use of the site by waterbirds, therefore there is no potential for adverse effects.

Conclusion

There is no potential for adverse effects on Wetlands.

5. MITIGATION

5.1 Principles and Approach

Section 4 of this NIS assessed the adverse effects likely to arise from the proposed development on the specific Attributes and Targets which define the Conservation Objectives for a number of Qualifying Interests of the Lower River Shannon SAC, the River Shannon and River Fergus Estuaries SPA, and the Mid-Clare Coast SPA. This section prescribes mitigation measures to ensure their full and proper implementation aimed at mitigating these adverse effects, thereby protecting the integrity of these European sites during the construction and operation of the proposed development.

The mitigation measures prescribed in this NIS have been designed according to the principle of a mitigation hierarchy, as outlined in the European Commission's guidance document *Assessment of plans and projects in relation to Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021). According to this hierarchy, mitigation measures first suggest *avoidance* (i.e. preventing significant impacts from happening in the first place) and then *reduction* of impact (i.e. reducing the magnitude and/or likelihood of an impact).

As mitigation measures are related directly to impacts and only indirectly to receptors and as, in this case, all of the affected receptors have been identified as being affected the same set of impacts, to describe mitigation measures under the headings of the relevant receptors would lead to undue repetition. Therefore, the measures prescribed in this NIS are described under common headings to minimise repetition.

The mitigation measures are prescribed in Section 5.2 and a protocol to ensure their full and proper implementation is prescribed in Section 5.3. The significance of any residual effects following the inclusion of mitigation measures is evaluated in Section 5.4. As per the assessment of adverse effects in Section 4, this evaluation is made in view of the relevant Conservation Objectives.

5.2 Mitigation Measures

5.2.1 General Construction Phase Mitigation

The following general mitigation measures will be employed to minimise potential significant negative effects on biodiversity which might arise during the construction of the proposed development.

- An Ecological Clerk of Works (ECoW) shall be appointed by Clare County Council prior to the commencement of works. It shall be their responsibility to supervise and provide recommendations on the execution of all works which have the potential to give rise to negative or positive effects on biodiversity. The ECoW will have at least five years' experience as an Ecologist of Works on linear infrastructure projects.
- Prior to any site clearance, excavation, or construction, a Construction Environmental Management Plan (CEMP) will be produced by the successful contractor(s). The CEMP will set out the Contractor's overall management and administration of the construction phase. The CEMP will be developed by the Contractor during the pre-construction phase, to ensure commitments included in the statutory approvals are adhered to.

- The Contractor will prepare site-specific Method Statements detailing how the works will be carried out. Each Site Foreman shall read, sign and abide by each site-specific Method Statement. A 'toolbox talk' will be conducted to induct the Works Team on the ecological considerations listed in the site-specific Method Statement by the Site Foremen.
- The Contractor will appoint a Site Environmental Manager (SEM) prior to the commencement of works. This person shall be responsible for carrying out environmental monitoring of the works and ensuring that the mitigation measures proposed in this report (as well as the CEMP and site-specific Method Statements) are adhered to.
- Site clearance for the construction of the proposed development and tree and shrub maintenance during the operational phase will only take place outside the nesting bird season (1st March – 31st August inclusive).
- If site clearance cannot be avoided during the nesting bird season, the area will be checked by a suitably qualified ecologist within 36 hours of the works. If nesting birds are found to be present, the site clearance works will cease until the chicks have fledged, or, until the NPWS have been consulted to determine the course of action.
- In the sensitive bird areas listed in Section 2.4.3.1, the removal of vegetation suitable for nesting will be programmed to take place in September to avoid the March-August nesting season and the main wintering bird season.
- The construction envelopes for the compounds will be temporarily fenced off at the outset of the construction to avoid unnecessary loss of habitat outside of the compound footprint during construction activities.
- The fencing for the compounds will be set so as to avoid existing hedgerow and treeline boundaries to avoid habitat loss. The set-back distance will be signed-off by the ECoW.
- Any excavations deeper than 1m will be either covered or have ramps fitted outside of working hours, which will allow Otter and other wildlife to escape. Similarly, any temporarily exposed open pipe system will be capped to prevent species such as Otter from gaining access when contractors are off site.
- A pre-construction survey will be carried out by a suitably qualified ecologist two to three weeks prior to the commencement of site clearance. The purpose of the survey is to identify Otter holts and invasive species that have appeared in the intervening period between the surveys undertaken for the EIAR/NIS and construction.
- If previously unidentified resting or breeding place of Otter are found in the vicinity of the proposed development prior to or during construction, the works at this location will cease immediately and direction will be sought from the NPWS.
- Construction is limited to the hours of 07:00-19:00 thereby reducing noise, vibration and lighting during the hours when Otters or other nocturnal species are active.
- Construction phase lighting will only illuminate work areas when necessary and will avoid illuminating any areas outside of the works area. There will be no lighting outside of working hours (07:00 – 19:00). Construction works during hours of darkness will only occur during the winter months when works are restricted to outside of sensitive bird areas. The ECoW will ensure that lights are directed into the construction area and that there is minimal light spill into the surrounding habitat.
- Construction works (other than vegetation clearance works mentioned above) across Moyasta Bridge, approach embankments and other sensitive bird areas will only take place over the summer months (April – September inclusive) – to avoid impacting on wintering birds. The only works to take place during the winter months will be short term, minor disturbance works for the installation of planting required to screen the greenway.

5.2.2 Disturbance to Wintering Birds during the Construction Phase

The following measures will be implemented with regards to wintering waterbirds which are Qualifying Interests of the River Shannon and River Fergus SPA and the Mid-Clare Coast SPA:

- Unless signed off by the ECoW, no construction works are permitted in the sensitive bird areas during the wintering bird season (October – March inclusive). The sensitive bird areas are listed in Section 2.4.3.1 and in Appendix E. The exception to this is landscape planting used bare root plants, which must be carried out during the winter months. The preparation of the area for planting must be carried out before the wintering bird season. The ECoW must sign off on any works including the tracking of vehicles in the sensitive bird areas. This will only apply in situations where the ECoW considers enough screening is present for the type of work/ tracking involved, or where access through a sensitive bird area is required occasionally to reach areas where construction is permitted.

5.2.3 Disturbance to Wintering Birds during the Operational Phase

Fencing and landscape planting has been incorporated into the design of the greenway to ensure greenway users and dogs are prevented from leaving the greenway. The use of fencing to restrict access is suggested by various studies in Ireland (Lewis et al., 2019; Adcock et al., 2018) and by Birdwatch Ireland (Birds of the Shannon Estuary) as a method of managing disturbance to wintering birds. Direct access to the areas outside of the greenway corridor will be achieved through fencing, and visual disturbance will be prevented through visual screening which will be provided by the fencing and landscape planting.

5.2.3.1 Fencing

The greenway will be segregated by a continuous stock proof fence and hedgerow planting. The proposed fencing is intended to prevent access by people and dogs to sensitive habitats located outside the greenway. A 100mm gap at ground level has been incorporated along the fence to facilitate the continued movement of small mammals, including otter, across the greenway.

The specification for Otter exclusion fencing (Natural England, 2026) states that otter can pass through gaps of 100mm. In this context, the proposed fencing is considered to balance habitat connectivity for Otter while providing physical exclusion for the all but the smallest dog breeds, and a strong behavioural deterrent for the remainder.

The fencing on Moyasta Bridge will be a solid barrier of 1.1m high with an additional 0.3m section of low permeability perforated fence to a total height of screening of 1.4m. The perforated section will be similar to that type used on the Dublin Port Greenway and shown in **Error! Reference source not found.** below.

Plate 5.1 Low permeability perforated screening on the Dublin Port Greenway.

5.2.3.2 Visual screening

Visual screening is proposed along the length of the greenway, with particular attention to the sensitive bird areas.

The existing hedgerows and treelines that form the boundaries of the railway corridor and field boundaries will be retained. Vegetation clearance will be minimised along the length of the greenway itself, and will only be undertaken within the footprint of the greenway, 1m verges and earthworks zones, up to a maximum width of 10m. The only work that will take place outside the fenceline is the landscape planting. All of the existing vegetation outside of the earthworks zone will be retained.

Mesh screening material (privacy netting) will be attached to the fencing in the sensitive bird areas, where no existing screening is present. The purpose of the mesh netting is to provide a full level of screening while the landscape planting becomes established.

Landscape planting and fencing on the bay-side of the sensitive bird areas will be the first works undertaken following site clearance. These planting works will take place over the winter following site clearance in September but are short duration and minor in nature so associated disturbance will be minimal. The works will be overseen by the ECoW. This will ensure that the planted screening for wintering birds has as much time as possible to established prior to opening of the greenway. The construction of the Greenway is anticipated to take 16-24 months.

Notwithstanding that greenway users will be within the disturbance distance of most bird species, the landscape screening will conceal users from birds line of sight, thereby removing the visual stimulus. The literature does not provide a specified height for visual screening to be effective, as this must be established on a case-by-case basis. The average adult height in Ireland is 1.7m, which remains broadly the same for adults on bicycles. Therefore, only the head of an adult of average height will be visible to birds where 1.4m screening is present, thereby obscuring the overall shape of users and reducing the disturbance response. In particular, dogs, which illicit a stronger disturbance response from birds, will be fully screened by the proposed landscaping.

Where no boundary is present, the standard planting proposal along the greenway will consist of a triple staggered row on each side of the greenway, outside the fence. The hedge will include both evergreen and deciduous species planted to a density of nine plants per linear

meter, with a 70:30 ratio of evergreen to deciduous species. The hedges will be made up of species that are fast growing and tolerant to exposure along the coast. The hedges will be maintained at a height of at least 1.4m where screening is required in the sensitive bird areas, as shown in Appendix F.

In areas where some planting is present such a hedge with gaps, supplementary fencing and planting will be undertaken to ensure that adequate screening and stock proofing is provided. The supplementary planting will use the same species and ratios as the general planting specification and achieve the same nine plants per linear meter density where gaps in the vegetation exist.

The species listed below are examples of the species that can be used for the hedges. These species are native, tolerant to exposure and mostly fast growing. The causeway leading to Moyasta Bridge may not have space to place three rows of native hedging on each side. If this is confirmed by the landscape contractor, there will be an option to use non-native evergreen species such as compact versions of *Escallonia* or *Elleagnus,* for example, to provide screening. A low earth bund may be required to ensure that these species reach the desired height. The final specification can include other species depending on availability and will be signed off by the ECoW in advance of ordering the plants.

- Evergreen:
  - Holly - *Ilex aquifolium*
  - Gorse - *Ulex europaeus*
  - Wild privet - *Ligustrum vulgare*
- Deciduous
  - Hawthorn - *Crategus monogyna*
  - Broom - *Cytisus scoparius*
  - European Spindle - *Euonymus europaeus;*
  - Burnet Rose - *Rosa spinosissima (R. pimpinellifolia)*
  - Dog rose - *Rosa canina*
  - Grey willow - *Salix cinerea*
  - Hazel - *Corylus avellana*
  - Elder - *Sambucus nigra*

5.2.4 Signage

Signage will be included at trail heads and at regular intervals along the route. The subject matter of the signage and suggested locations are presented below in Table 5-. Signage will inform greenway users of the importance of the area to wintering birds and request responsible behaviour from all those using the amenity.

To avoid an excessive amount of signage being installed and potentially ignored by users, the final locations of signs will be coordinated by Clare County Council.

Table 5-1 Subject Matter and suggested locations of proposed signage.

Subject	Locations

The importance of the bay for birds – it is an internationally important conservation area	At the trail heads. Both sides of the Moyasta Bridge causeway the entrances to the greenway from the trailheads. Points where there is existing public access to the coast including Brew's Bridge, Carrowncalla, and the ends of the local roads leading from the N67 to the coast that the greenway crosses.
Dogs must be kept on leads at all times.	At the trail heads. The entrances to the greenway from the trailheads. Points where there is existing public access to the coast including Brew's Bridge, Carrowncalla, and the ends of the local roads leading from the N67 to the coast that the greenway crosses.
Leave no trace messaging, in particular cleaning up after dogs.	At regular intervals along the route.
No access to private lands or public access to shoreline	At field gates and any private gates to shoreline

Signage can be effective in combination with physical mitigation measures which can prevent the primary sources of disturbance – through visual and aural stimuli. Signage has been shown to reduce the level of disturbance in some settings (Allbrook & Quinn, 2020; Cutts et al., 2024) and is recommended as a mitigation measure by AEWA (2022). Herstine et al. (2006) concluded that signage can be an effective approach for passively managing human behaviour and tourism in natural resource settings. A study from Iceland (Marschall et al., 2017) on the impact of signage on visitor behaviour around seals showed that signage was effective, but in particular, 'teleological' signage which provided an explanation as well as a command was more effective. The signage shall be aesthetically engaging to encourage buy-in from visitors. However, in many cases signage can be ignored by visitors, (Braby et al., 2009), therefore physical mitigation measures have been specified in combination with signage.

5.2.5 Water Quality

During construction, the following guidance documents for construction work on, over or near water will be adhered to:

- C532 Control of water pollution from construction sites: guidance for consultants and contractors (CIRIA, 2001).
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers.
- CIRIA C648 Control of water pollution from linear construction projects: technical guidance (CIRIA, 2006).
- Construction, Replacement or Alteration of Bridges and Culverts: A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945 (OPW, 2019).
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2006b).
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016).
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board).

The following mitigation measures relating to the protection of water quality will apply during the construction of the proposed development:

- Double silt fences will be installed along the watercourses in the vicinity of the works to contain any potential silt or sediment run-off, with particular attention to watercourses where instream works are required. Silt fences will be erected in accordance with the manufacturer's recommendations.
- Stockpiling of construction material or topsoil will be prohibited within 10m of the watercourse, in order to minimize sources of sediment runoff.
- Storage tanks will be bunded to capture any oil leakage. Bund specification will conform to the current best practice for oil storage (Enterprise Ireland, BPGCS005).
- Storage tanks, bunding, and machinery will be maintained and checked regularly for leakage.
- There are no instream works proposed to watercourses other than ditches, so the normal restriction of in-stream works to the months of June and September is not required for the proposed development.

The following measures prescribed regarding surface water run-off will also minimise the risk of any input of cementitious material into watercourses during the construction of the proposed development:

- When working in or near the surface water and the application of in-situ materials cannot be avoided, the use of alternative materials such as biodegradable shutter oils shall be used;
- Any plant operating close to the water will require special consideration on the transport of concrete from the point of discharge from the mixer to final discharge

into the delivery pipe (tremie). Care will be exercised when slewing concrete skips or mobile concrete pumps over or near the watercourses;

- Placing of concrete in or near the watercourses will be carried out only under the supervision of a suitably qualified Environmental Manager;
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials. Such spills shall be contained immediately, and runoff prevented from entering watercourses;
- Concrete waste and wash-down water will be contained and managed on site to prevent pollution of the watercourses;
- On-site concrete batching and mixing activities will only be allowed at the identified construction compound;
- Washout from concrete lorries, with the exception of the chute, will not be permitted on site and will only take place at the construction compound (or other appropriate facility designated by the supplier);
- Chute washout will be carried out at designated locations only. These locations will be signposted. The concrete plant and all delivery drivers will be informed of their location with the order information and on arrival on site; and,
- Chute washout locations will be provided with appropriate designated, contained impermeable area and treatment facilities including adequately sized settlement tanks. The clear water from the settlement tanks shall be pH corrected prior to discharge (which shall be by means of one of the construction stage settlement facilities) or alternatively disposed of as waste in accordance with the Contractor's Waste Management Plan.

The measures prescribed regarding surface water run-off will also remove the risk of any input of hydrocarbons and other chemicals into the watercourses. However, the following additional measures shall also apply:

- Fuel storage tanks shall have secondary containment provided by means of an above ground bund to capture any oil leakage.
- Storage tanks and associated provision, including bunds, will conform to the current best practice for oil storage and will be undertaken in accordance with Best Practice Guide BPGCS005 – Oil Storage Guidelines (Enterprise Ireland).
- Spill kits shall be available on-site. Spill kits shall be provided at all refuelling points and fuel/chemical storage areas. Staff shall be trained in the use of spill skits and spill kits.

The following mitigation measures relating to sediment control and water quality during the installation of the 25 culverts:

- Culverts will be installed in ditches by placing a suitably sized pipe or section of box culvert in the existing channel.
- It is expected that the ditches will be dry, but if flow is present, the works area will be over pumped which the culvert is installed. The pump inlet and outlet will be fitted with a silt sock to prevent sediment being released into the ditch. A hay bale, silt fence or similar silt trap will be installed downstream of the works area.
- The pipe will be laid inside the existing channel and covered with crushed stone to the level required. The silt trap will be removed once the sediment has settled.
- No machinery is permitted in the watercourses.

Minor repairs will be required on some of the structures, limited to vegetation and repointing. The following mitigation measures relating to the repair of structures are as follows:

- Repointing and concrete repairs will be undertaken on foot, from a ladder, using scaffolding or using a bridge inspection unit.
- A catch net will be placed flush with the bridge to catch any spilled mortar or concrete. The catch net will be made of Visqueen heavy duty plastic sheeting or similar and will cover the entire area underneath the works.
- Repointing and concrete repairs will take place in dry weather and will not take place if rain is forecast in the following 12 hours. The commencement of the works will be approved by the Employer's Representative.
- Mortar and concrete will be mixed in a watertight container at least 20m from the watercourse.
- Vegetation will be removed mechanically. No herbicide will be used to remove vegetation from bridges.

The bridges have been designed to minimise the impacts on the watercourses. The following mitigation measures relating to sediment control and water quality during the construction of the eight bridges are:

- The new bridges will be clear span, with abutments set back from the riverbanks as far as possible, and the decks and parapets will be prefabricated.
- Where watercourses are present, silt fences will be installed along the riverbanks to intercept run-off during the construction phase and to protect the riparian vegetation.
- The silt fences will be located as far back from the bank as possible.
- No machinery is permitted in the watercourses.

The steel components of Moyasta Bridge will be sandblasted and repainted. In order to carry this work out, the bridge structure will be encapsulated, created a sealed environment in which the works will take place on the bridge while it is sandblasted and painted. The following mitigation measures relating to the protection of water quality during the sandblasting and painting of Moyasta Bridge are:

- A scaffold structure will be hung on the bridge desk and used to create a frame around the bridge structure.
- Plastic sheeting will be fitting over the scaffolding and tightened by applying heat.
- Any gaps will be sealed using tape.
- The access point will be fitted with a zip to create a fully enclosed working area.
- The encapsulated area will ensure that no dust, frit or paint reaches the watercourse below. The internal temperature will be raised using heaters to create a dry environment and to ensure that the paint cures properly.
- Following the works, any dust, grit and the plastic sheeting will be removed and disposed of appropriately and the scaffolding will be dismantled.

Wastewater drainage from all site offices and construction facilities will be contained and disposed of in an appropriate manner to prevent water pollution and in accordance with the relevant statutory requirements.

Method statements that are prepared for the works that could affect biodiversity will be reviewed and approved by the Employer / Employer's Representative and the ECoW in advance of the works beginning. All method statements for works in, near or liable to impact on a waterway must have prior agreement with IFI.

The operation of the greenway will not result in any changes to the hydrological regime or water quality of the area, as there will be no further disturbance of soils post-construction, and traffic will be limited to non-motorised traffic other than occasional maintenance vehicles and farm machinery. Surface water run-off will discharge over the edge or to existing drainage ditches where present.

At the trail heads, on the surface water will be directed to bioretention areas for treatment in line with SUDs principles. The use of permeable pavements will provide sufficient mitigation for hydrocarbon pollution that there are no residual impacts on the waterbodies.

Given the full and proper implementation of these water quality protection measures, the construction, operation, and maintenance of the proposed development will not give rise to adverse effects.

5.2.6 Invasive Species

Japanese Knotweed was recorded at various locations along the route of the proposed development. The following measures will be implemented with regards to invasive species.

- The control and management procedures outlined in the Invasive Species Management Plan, presented in Appendix G, will be adhered to during the construction of the proposed development.
- The Contractor shall prepare a detailed Biosecurity Protocol describing their proposed approach to ensuring that invasive species are not imported or spread during the construction of the proposed development. The Contractor's Biosecurity Protocol shall be in accordance with *The Management of Invasive Alien Plant Species on National Roads – Standard* (TII, 2020a) and *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance* (TII, 2020b). The Biosecurity Protocol shall include, as a minimum, the following measures to prevent the spread of invasive species:
    - Good construction site hygiene will be employed to prevent the introduction and spread of problematic IAPS (e.g., Japanese knotweed and Himalayan Balsam) by thoroughly washing vehicles prior to leaving any site.
    - All plant and equipment employed on the construction site (e.g., excavators, etc.) will be thoroughly cleaned down in designated areas only using a power washer unit prior to arrival on site to prevent the spread of IAPS.
    - Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any IAPS and where it is confirmed that none are present.
    - Landscaping of the proposed development shall use native species of plants unless in exceptional circumstances, and, insofar as possible, soil reused from on-site excavations. If soil/substrate needs to be imported to the site for the purposes of the proposed development, the Contractor shall ensure that the imported soil/substrate is free from invasive species.

The treatment of Japanese Knotweed will continue as per Clare County Councils current invasive species management plan. Clare County Council will continue treatment of Japanese Knotweed outside of the red line boundary, with the agreement of neighbouring landowners, to ensure that it is fully eradicated from the area and it does not spread back into the proposed development boundary from adjacent lands.

5.2.7 Monitoring and Adaptive Management

Monitoring and adaptive management will be undertaken to ensure that the mitigation measures are in place and to document their effectiveness.

Screening

The planted screening and privacy mesh in the sensitive birds areas will be monitored by the ECoW every September and January for three years following the opening of the Greenway. The purpose of the monitoring is to identify any damaged plants or privacy mesh. Any damaged or dead plants or damaged privacy mesh will be replaced by the Contractor within the three year defects period which will be specified in the Contract, or alternatively, Clare County Council will assume responsibility for replacing any damage as part of the routine maintenance of the Greenway.

Disturbance Monitoring

A qualified ecologist with relevant experience will be appointed to monitor birds and bird behaviour in the sensitive bird areas for two winter seasons following the opening of greenway to the public, to demonstrate the effectiveness of the mitigation.

The response of birds to greenway users will be examined over three 3-hour surveys each season, which will be undertaken over the winter months for two years following the opening of the greenway to the public. The surveyor will position themselves so that they do not disturb the birds. The survey will commence at dawn to ensure birds have not been disturbed when the survey begins. The surveyor will record:

- The number and position of birds in the vicinity of each sensitive bird area.
- The details of the greenway users (number of people, dogs on/off lead, cyclist/ walkers etc.).
- Any behavioural change by birds, including no response. Notes on the response will be made in accordance with the disturbance categories in Section 7.5.2.1.4.
- Any activity which led to the disturbance such as shouting or waving.

Should the results show that greenway users are causing disturbance, the screening height will be raised locally to reduce the visibility of user to the intertidal areas. This data will be made available to other local authorities and interested parties by request, to inform the approach on similar projects in sensitive environments.

For example: the surveys at Moyasta Bridge show a wide variation in the total number of birds present, and total number of each of the 26 species recorded per survey. On average, each species was recorded on 5.3 of the 12 surveys. Teal was the only species recorded on every survey. The average number of Teal recorded within 500m of Moyasta Bridge was 106, with range of 1 to 189.

The variability can be explained by a number of factors including weather conditions, tidal state, disturbance in other areas of the site and the mobile nature of wintering birds. In order to monitor disturbance, it is inappropriate to rely on numerical thresholds to determine where disturbance is significant or not.

The data from the 2020/2021 and the 2022/2023 seasons show that the total number of individual birds is split across the distance buffers is that a small proportion of the birds within 500m of proposed development occurs within 100m of the bridge (Table 5-2).

Table 5-2 Birds numbers within buffers at Moyasta Bridge (SBA 4)

Buffer	0-20M	20-50m	50-100m	100-200m	200-300m	300-400m	Total
Total Number of birds	37	39	108	242	146	290	862
% of total	4%	5%	13%	28%	17%	34%	100%

The assessment of the effectiveness of the mitigation measures will involve a qualitative and quantitative assessment.

The bird surveys will follow the methodology used for the surveys to inform this assessment and include a high and low tide count each month. The parameters that will be examined are:

- The species diversity (min/ max, average).
- The total number of individuals (min/ max, average).
- The total numbers of each species (min/ max and average).

These figures will be further split into buffers of 0-20m, 20-50m, 50m-100m, 100m-200m, 200-300m and 300m-400m and compared with the numbers recorded in the surveys to date.

The assessment of the effects of disturbance will be based on quantitative data and a qualitative evaluation, informed by expert ecological judgement. In interpreting the survey data, the natural variability in the patterns of usage of the site by wintering birds will be considered. This variability can be caused by the tidal state, weather, disturbance in other areas of Poulnasherry Bay, and the mobile nature of wintering birds. With this in mind, bird counts alone are not a reliable indicator of disturbance. Instead, the assessment will focus on whether there is any change in the pattern of habitat use relative to the baseline conditions coupled with survey information on the responses of birds to greenway users. This dual-parameter approach will ensure that the assessment is meaningful and that any effects of disturbance on birds is identified and can be remedied.

Should the surveys demonstrate that birds are being disturbed in a particular area at levels which would constitute a significant effect, notwithstanding the screening, the following adaptive management strategies can be implemented along with a further season of monitoring to confirm their effectiveness:

- Additional planting along the sensitive bird areas will be added locally using evergreen shrubs.
- The height of the screening on both sides of the greenway can be adjusted if it is concluded that users are causing disturbance in a particular area. This will be achieved by allowing the vegetation to grow to a greater height.

These circumstances are not contemplated in the literature and considered to be highly unlikely to eventuate considering the screening and signage already provided for in the design. Nevertheless, it is important to demonstrate the effectiveness of the mitigation and the absence of significant effects on wintering birds.

5.3 Implementation

In order to give effect to the mitigation prescribed in this NIS it should be a condition of any consent granted in respect of the proposed development that all of the mitigation, including monitoring and enforcement, prescribed in this NIS be binding, during the construction phase, on the Contractor and, during operational phase, on the local authority. Accordingly, all of the mitigation prescribed herein shall be transposed into the Contract Documents for the construction of the proposed development.

5.3.1 Construction and Environmental Management Plan

Prior to any site clearance, excavation, or construction, a Construction Environmental Management Plan (CEMP) will be produced by the successful contractor(s). The CEMP will set out the Contractor's overall management and administration of the construction phase. The CEMP will be developed by the Contractor during the pre-construction phase, to ensure commitments included in the statutory approvals are adhered to. The aim of this CEMP is to address issues that can arise during construction including noise and vibration, traffic management, working hours, pollution control, dust control, road cleaning, compound / public health facilities and staff parking, all associated with the construction works.

Prior to the on-site activities commencing, this plan will be revised by the appointed lead contractor and expanded to produce a CEMP, which shall incorporate:

- Operational Health & Safety (OH&S) Management Plan;
- Environmental Management Plan, including Waste Management Plan;
- Pedestrian and Traffic Management Plan.

The CEMP will be integrated into and implemented throughout the construction phases of the project to ensure the following:

- All site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- All waste materials generated by site activities, that cannot be reused on site, are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed/permitted facilities in compliance with the Waste Management Acts 1996 to 2005;
- Any environmental impacts (noise, vibration, dust, water) of project construction work activities on receptors and properties located adjacent to the project work areas, and on the local receiving environment, are managed and controlled.

During construction, all works must comply with relevant legislation and guidelines in order to reduce and minimise environmental impacts and to protect all ecological receptors. In particular, there must be full compliance with the following:

- The Construction Management Plan.
- The mitigation prescribed in this NIS and the accompanying EIAR.
- Any conditions which might be attached to the proposed development's planning consent.
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016).
- C532 Control of water pollution from construction sites: guidance for consultants and contractors (CIRIA, 2001).
- C648 Control of water pollution from linear construction projects: technical guidance (CIRIA, 2006).

- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2006).
- Guidelines for Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (TII, 2008).
- All applicable legislative requirements in relation to environmental protection.

This list is non-exhaustive. All environmental commitments/requirements and relevant legislation and guidelines which are current at the time of construction will be followed.

5.4 Residual Effects

5.4.1 Sea Lamprey and River Lamprey

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Sea Lamprey and River Lamprey to imperceptible levels. Any residual effects on water quality or migratory barriers will not adversely affect this Qualifying Interest.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC and the Lower River Shannon SAC in view of the Conservation Objectives for 'Sea Lamprey' and 'River Lamprey'.

5.4.2 Atlantic Salmon (*Salmo salar)*

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Atlantic Salmon to imperceptible levels. Any residual effects on water quality or migratory barriers will not adversely affect this Qualifying Interest.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC in view of the Conservation Objective for 'Atlantic Salmon'.

5.4.3 European Otter (*Lutra lutra)*

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on European Otter to imperceptible levels. Any residual effects on water quality and disturbance will not adversely affect this Qualifying Interest.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC in view of the Conservation Objective for 'European Otter'.

5.4.4 Large Shallow Inlets and Bays, Mudflats and Sandflats not Covered by Seawater at Low Tide and Reefs

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Estuaries, and Mudflats and sandflats not covered by seawater at low tide to imperceptible levels. Any residual effects water quality will not adversely affect these Qualifying Interests.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC in view of the Conservation Objective for 'large shallow inlets and bays' and 'mudflats and sandflats not covered by seawater at low tide' and 'reefs'.

5.4.5 Salicornia and Other Annuals Colonising Mud and Sand, Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*) and Mediterranean Salt Meadows (*Juncetalia maritimi*)

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Salicornia and other annuals colonising mud and sand and Atlantic salt meadows to imperceptible levels. Any residual effects on water quality will not adversely affect these Qualifying Interests.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC in view of the Conservation Objective for 'Salicornia and other annuals colonising mud and sand', 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' and 'Mediterranean salt meadows (*Juncetalia maritimi*)'.

5.4.6 Wintering Birds

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Wintering bird species to imperceptible levels. Any residual effects on water quality or disturbance do not constitute adverse effects.

Even with the mitigation measures in place, there is always a risk of people and dogs accessing the coastal areas where existing access is to be maintained, specifically at Brew's Bridge, Carrowncalla, and the local roads leading from the N67 to the coast to the west of Moyasta Bridge. Given the level of use of the Greenway in the winter and the likelihood of a disturbance event to occur at the same time as bird being present, this would not constitute an adverse effect.

Following the installation of steel wire on the Moyasta Bridge parapets, the risk of increased predation by raptors will be removed and there is no potential for adverse effects.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the River Shannon and River Fergus SPA or the Mid-Clare Coast SPA in view of the Conservation Objectives for wintering bird species.

5.4.7 Wetlands

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will reduce all negative impacts on Wetlands to imperceptible levels. Any residual effects on water quality will not adversely affect this Qualifying Interest.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the River Shannon and River Fergus SPA in view of the Conservation Objective for 'Wetlands'.

5.4.8 Invasive Species

It is considered that the mitigation prescribed in Section 5.2 and the implementation and compliance measures prescribed in Section 5.3 will remove the potential risk of spread of invasive species.

Therefore, given the full and proper implementation of the mitigation prescribed in this NIS, it can be concluded beyond all reasonable scientific doubt that construction and operation of the proposed development will not adversely affect the integrity of the Lower River Shannon SAC Conservation Objective for Annex I Habitats.

6. IN-COMBINATION EFFECTS

6.1 Introduction

Article 6(3) of the Habitats Directive requires that AA be carried out in respect of plans and projects that are likely to have significant effects on European sites, "*either individually or in combination with other plans or projects*". Therefore, regardless of whether or not the likely effects of a plan or project are significant when considered on their own, the significance of the combined effects of the plan or project under assessment and other plans and projects must also be evaluated.

6.2 Methodology

Plans and projects with potential for interactions with the proposed development were selected for assessment. For the purposes of the assessment, small scale and domestic developments were not considered given the nature of the proposed development and the fact that these developments would be subject to stringent planning controls. Plans and projects with planning permission within the last ten years were taken into consideration.

The ePlanning websites for Clare County Council (CCC), the EIA Portal, and the planning application search tool on An Coimisiún Pleanála's (ACP) website was used to search for planning applications.

6.3 Outcome

As shown in Table 6-1 below, the proposed development, in combination with other plans or projects, does not have the potential to adversely affect any European site.

Table 6-1 Assessment of potential adverse effects on the integrity of European sites from the proposed development in combination with other plans and projects.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
West Clare Railway Greenway Section 2 **Clare County Council**	This section of the project aims to develop cycling and walking facility from Ennis to Ennistymon. The project is currently in Phase 2 of Project Management Guidelines. The construction phases of the proposed development and this project will not overlap as this project is currently in Option Selection Phase.	This project is beyond the zone of influence for the proposed development. This project is similar in nature and scale to the proposed development, and the (unmitigated) impacts of this project in terms of habitat loss and water quality are similar to that of the proposed development. However, this development is wholly inland and does not have the potential to cause disturbance impacts to wintering birds. Considering the nature and scale of the proposed development, and the distance between the proposed development and this project, there will be no adverse effects in combination with the proposed development.
West Clare Railway Greenway Sections 3 & 4 **Clare County Council**	Sections 3 & 4 of the West Clare Railway Greenway is currently being developed. This projects will develop cycling and walking facility from Ennistymon to Miltown Malbay, and from Miltown Malbay to Moyasta. This project is currently at the option selection stage.	This project will connect with the proposed development in Moyasta. This project is similar in nature and scale to the proposed development, and the (unmitigated) impacts of this project are similar to that of the proposed development. This project has the potential to increase the visitor numbers on the proposed development by providing an additional link to Section 1 at Moyasta, however, this could also draw user from Section 1 to Sections 3 and 4. In either scenario, the mitigation measures, monitoring and adaptive management proposed for Section 1 have considered 218 user per hour, and any increase in user numbers would be inconsequential. Therefore, there will be no adverse effects in combination with the proposed development.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
ACP Case Ref: JA03.320967 **Name:** Kilkee Flood Relief Scheme **Address:** Kilkee, Co. Clare.	**Decision:** Approved with conditions on 20/08/2025 Kilkee Flood Relief Scheme includes a series of flood defences situated within the catchments of both the Victoria, Well & Atlantic Streams, the three sources of fluvial flooding in the town. The NIS provides mitigation for the protection of water quality for pluvial and fluvial works, and for the prevention of the spread of invasive species.	This application overlaps with the proposed development. Provided that the mitigation measures prescribed in the NIS' for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: PL03.321258 **Name:** Proposed Wastewater Treatment Plant, Kilkee **Address:** Sites in the townlands of Kilkee Lower and Foohagh, Kilkee, Co. Clare.	**Decision:** Approved with conditions on 11/06/2025 10 year permission for the construction of a new foul pumping station and a new wastewater treatment plant and all associated works. A Natura Impact Statement accompanies this application. The NIS sets out mitigation measures for the protection of water quality.	This application is located within 1.6km west of the proposed development. Provided that the mitigation measures prescribed in the NIS' for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: OA07.321697 **Name:** Sceirde Rocks Offshore Wind Farm **Address:** Located off the coast of Co. Galway & Co. Clare.	**Decision:** Due to be decided by 06/02/2026 This application is for 30 no. offshore wind turbine generators with gravity based fixed-bottom foundations & all associated work. NIS' have been prepared for both the Offshore Site and Onshore Site of the proposed Sceirde Rocks Offshore Wind Farm. Mitigation has been provided for the Offshore Site, including measures against the spread of invasive and non-native species, underwater noise mitigation, marine mammal mitigation, and mitigation for the presence of vessels. The Onshore Site mitigation includes measures relating to water quality, disturbance to Otter and wetland and waterbirds, and the spread of invasive and non-native species.	This application is located within 2km east of the proposed development. The (unmitigated) impacts of this application are similar to that of the proposed development, though this application is a much larger scale than the proposed development. Provided that the mitigation measures prescribed in the NIS' for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: PL03.323152 **Name:** Moanmore Lower Wind Farm	**Decision:** Appeal lodged on 28/07/2025. A decision had not been reached at the time of writing. Construction of 3 wind turbines and all associated site works. This application is seeking a ten year permission and a 40 year operational	This application is located within 2km east of the proposed development. Provided that the mitigation measures prescribed in the NIS for this application are

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
Address: Moanmore Lower, Moanmore South, Tullabrack, Tullabrack East and Gower South, Kilrush, Co. Clare	life from the date of commissioning of the wind farm. The planning application is accompanied by an Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS). The NIS sets out mitigation measures for the prevention of negative water quality impacts.	implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: PL03.319961 **Name:** Ballykett Wind Farm **Address:** Ballykett, Tullabrack East, Tullabrack West, Tullabrack and Gower South, Kilrush, Co. Clare.	**Decision:** Approved with conditions on 08/10/2025 Four turbine wind farm, electrical substation, grid connection to Tullabrack 110kV substation, meteorological mast and all associated infrastructure. The planning application is accompanied by an Environmental Impact Assessment (EIAR) and a Natura Impact Statement (NIS). The NIS sets out mitigation measures for the protection of water quality.	This application is located approximately 3.4km northeast of the proposed development. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: PA03.319080 **Address:** Moneypoint Generating Station, Moneypoint, Co. Clare	**Decision:** Approved with conditions on 25/09/2024 Proposed transition and conversion of the existing 900MW electricity generating station from coal to heavy fuel oil and associated ancillary development at Moneypoint Generating Station, Moneypoint, Co. Clare. www.moneypointsecurityofsupply.ie The NIS sets out mitigation measures for the prevention of disturbance to Otter and breeding and wintering birds, negative water quality impacts, and the spread of invasive species.	This application is located approximately 4.2km southeast of the proposed development. The (unmitigated) impacts of this application are similar to that of the proposed development. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: VA03.307798 **Name:** 400kV electricity transmission cables application **Address:** Townland of Carrowdotia South County Clare and Kilpaddoge County Kerry.	**Decision:** Approved with conditions on 04/06/2021 Proposed 400kV electricity transmission cables, extension to the existing Kilpaddoge Electrical Substation and associated works, between the existing Moneypoint 400kV Electrical Substation in the townland of Carrowdoita South County Clare and existing Kilpaddoge 220/110kV Electrical Substation in the townland of Kilpaddoge County Kerry. The development includes work in the foreshore.	This application is located approximately 4.5km southeast of the proposed development. It crosses the Lower Shannon Estuary. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development, there will

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
	The NIS sets out mitigation measures for the protection of water quality, the prevention of the spread of invasive species, and disturbance to marine mammals.	be no adverse effects in combination with the proposed development.
ACP Case Ref: VA08.320300 **Name:** Shannon Technology and Energy Park (STEP) 220kV Grid Connection **Address:** In the townlands of Carhoona, Carhoonakilla, Carhoonakineely, Cockhill, Coolnanoonagh, Farranawana, Kilcolgan Lower, Kilcolgan Upper, Kilpaddoge and Ralappane, County Kerry.	**Decision:** Approved with conditions on 13/03/2025 This project will provide a connection (two 220 kV cables and fibre optic cables) between the proposed STEP Power Plant via two substations (1No. onsite EirGrid/ESBN Gas Insulated Switchgear (GIS) substation and 1No. SLNG GIS substation), and a connection point (a Line Cable Interface Mast (LCIM) in the vicinity of the existing ESBN/EirGrid Kilpaddoge 220 kV substation. The LCIM is part of the Kilpaddoge – Tarbert 220 kV Circuit, which is located approximately 5 km east of the proposed STEP facility. A 50 MVAr reactor will also be installed adjacent to the EirGrid GIS substation. A fibre optic line will be laid alongside the 220kV cables. The NIS sets out mitigation measures for the protection of water quality, the prevention of disturbance to Otter and wintering birds.	This application is located approximately 7.2km southeast of the proposed development, across the lower Shannon Estuary. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development, there will be no adverse effects in combination with the proposed development.
CCC ePlanning Ref: 161012 **Name:** Partial Coastal Protection - Doonbeg Golf Resort **Address:** Carrowmore / Whitestrand / Doughmore, Doonbeg, Co. Clare	**Decision:** Approved on 21/12/2017 Coastal erosion management works at, and adjacent to, Carrowmore Dunes, White Strand, Doughmore Bay and Trump International Golf Links and Hotel, Doonbeg, Co. Clare. The development includes the provision of two new protection structures at the dunes. The construction/development will include excavation of existing sand, the use of sheet piling backstops with soil nailing, geotextile underlay, armourstone protection to the sheet piles with sand and cobbles currently on the beach being used to form a dune profile over a distance of 609 metres (626m curved length with additional revetment overrun) approximately at the southern end of Doughmore Bay, adjacent to and west of the Trump International Golf Hotel. The works will be over a distance of 256 metres (257m curved length with additional revetment overrun) approximately at the northern end of Doughmore Bay, west of the golf course. The storage of the excavated sand on site as part of ongoing replenishment and future site management is also proposed. In a seaward-landward direction the overall extent of the revetment structure will be approximately 12 metres seaward of the existing general	This application is located approximately 9.0km north of the proposed development. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development and the distance between this application and the proposed development, there will be no adverse effects in combination with the proposed development.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
	dune face with additional underlayers and engineering works. The final structure will be screened from view. Also included as part of the development are enabling works; ancillary construction works and compound; public car park; ongoing access to the beach throughout the construction programme and beyond. An Environmental Impact Statement (EIS) and Natura Impact Statement (NIS) accompanies this planning application. The NIS sets out mitigation measures for the protection of dune habitats, the protection of water quality, the prevention of the spread of invasive species, and the prevention of disturbance to Sand Martins and wetland and waterbirds.	
ACP Case Ref: VC08.318208 **Name:** Shronowen Wind Farm **Address:** In the townlands of Ballyline West, Coolkeragh, Dromalivaun and Tullamore, Co. Kerry.	**Decision:** Approved with conditions on 27/09/2022 This application is for a 12-turbine wind farm situated in the townlands of Shronowen, Dromalivaun, Coolkeragh, Tullamore and Ballyline West. To facilitate a grid connection and export of renewable electricity to the National Electricity Grid (NEG), the proposed development will connect to the existing 110 kV transmission line to the east of the site by means of an underground 110 kV cable from the wind farm substation. An alternative 110 kV underground cable route is also considered in the EIAR. The final selected grid route and connection strategy will be confirmed by way of a future grid connection offer process and as determined by EirGrid. The NIS sets out mitigation measures for the management of invasive species, and the prevention of negative water quality impacts.	This application is located approximately 13.2km south of the proposed development, to the south of the mouth of the Shannon. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development and the distance between this application and the proposed development, there will be no adverse effects in combination with the proposed development.
ACP Case Ref: PL03.318525 **Name:** Cahermurphy Two Wind Farm **Address:** Cahermurphy, Knockcnahila More South, Carrownagry South, Caheraghacullin, Drummin, Doolough, Glenmore & Booltiagh, Co. Clare	**Decision:** Was due to be decided by 09/04/2024, and is currently under appeal after being refused permission due to reasons relating to impacts to visuals and the character of the landscape. Construction of up to ten wind turbines, one meteorological mast with a maximum height of up to 100 metres, one 38kV electrical substation and all associated and ancillary site development works. The application is seeking a ten year planning permission and 30 year operational life from the date of commissioning of the wind farm. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) have been prepared in respect of the proposed development.	This application is located approximately 15km northeast of the proposed development. Provided that the mitigation measures prescribed in the NIS for this application are implemented, and considering the nature and scale of the proposed development and the distance between this application and the proposed development, there will be no adverse effects in combination with the proposed development.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
	This application includes disturbance limitation measures and invasive species prevention measures, and the NIS sets out mitigation measures for the protection of water quality, the prevention of the spread of invasive species, and disturbance to marine mammals.	

7. CONCLUSION

This NIS has been prepared in accordance with the relevant provisions of the Habitats Directive, the Habitats Regulations and the Planning and Development Act, as well as the relevant case law and current guidance.

It has demonstrated that, in the absence of appropriate mitigation, the proposed development, individually or in combination with other plans or projects, would adversely affect the integrity of three European sites, namely of the Lower River Shannon SAC, the River Shannon and River Fergus SPA, and Mid-Clare Coast SPA in view of their Conservation Objectives. In light of this finding, this NIS has prescribed appropriate mitigation to eliminate, beyond reasonable scientific doubt, the risk of such effects occurring.

A key consideration has been the risk of disturbance to wintering birds during the operational phase of the proposed development through people and dogs accessing wintering bird habitat, noise as well as visual disturbance from the greenway. The NIS has described the avoidance and mitigation measures which have led to the conclusion of no adverse effects on wintering birds as a result of disturbance. This conclusion has considered the distribution and sensitivities of wintering birds, the route of the greenway, and the presence of screening between the greenway and the shore. It has also considered the mitigation measures employed to minimise disturbance, primarily fencing and screening.

Any residual effects, either individually or in combination with other plans or projects, have been assessed as not constituting adverse effects on the integrity of the European sites concerned.

This assessment has been undertaken on the basis of the best scientific knowledge in the field and the Precautionary Principle. No reasonable scientific doubt remains as to the absence of such effects.

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