Celtic Interconnector

Volume 6A

Onshore AA Screening and Natura Impact Statement

June 2021

Co-financed by the European Union
Connecting Europe Facility

Tionscadal Éireann
Project Ireland
2040

EIRGRID

The Oval, 160 Shelbourne Road, Ballsbridge, Dublin D04 FW28
Telephone: 01 677 1700 • www.eirgrid.ie

Mott MacDonald
South Block
Rockfield
Dundrum
Dublin 16
D16 R6V0
Ireland

T +353 (0)1 2916 700
mottmac.com

Volume 6A
Onshore AA Screening and Natura Impact Statement

Celtic Interconnector

June 2021

Document reference: 229100428 | 509 | D

The contents of this publication are the sole responsibility of the author and do not necessarily reflect the opinion of the European Union

Information class: Standard

Contents

Tables

Figures

1 Introduction

1.1 Overview of Celtic Interconnector Project

The Celtic Interconnector Project ('The Project') will provide a link to transfer electrical energy between the electrical transmission grids in Ireland and France. The link will have the capacity to carry up to 700MW of electrical energy between the two systems.

The transmission grids in both Ireland and France are operated at High Voltage Alternating Current (HVAC). High Voltage Direct Current (HVDC) is used for the transmission of electrical power over large distances where HVAC is not technically or economically feasible.

Converter Stations are therefore required in both France and Ireland to convert the HVDC power to HVAC.

The main elements of the Project are:

- A submarine circuit between Claycastle Beach in Youghal, County Cork connecting approximately 497 kilometres (km) in length of submarine cable between the Ceinture Dorée (Gold Belt) coast in Brittany France and Ireland;
- A landfall point, where the submarine circuit will come onshore and terminate at a transition joint bay, to the north of the car park at Claycastle Beach.
- An underground HVDC cable between the landfall point at Claycastle Beach and the Converter Station compound at Ballyadam, east of Carrigtwohill.
- A Converter Station compound at Ballyadam (the proposed Converter Station site; which is located within 'the Wider Ballyadam/IDA site') to convert the electricity from HVAC to HVDC and vice versa.
- An underground HVAC cable between Ballyadam and the connection point to the grid (Knockraha substation).
- A connection to the Irish National Grid at Knockraha substation in County Cork.

A fibre optic cable will also be laid along the entire route for operational control, communication and telemetry purposes.

1.2 Purpose and Scope of this NIS

This report has been prepared to assist the relevant competent national authority (An Bord Pleanála) for the onshore elements of the Project in Ireland (hereafter in this NIS, 'the Proposed Development'), to fulfil the requirements of Article 6(3) of the EU Habitats Directive 92/43/EEC ('The Habitats Directive').

This Appropriate Assessment Screening and Natura Impact Statement assesses the effects on European sites of the Irish land-based elements of the Project (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Irish elements offshore, elements in the UK Exclusive Economic Zone, and French elements of the Project.

Reporting to assist with fulfilling Article 6(3) requirements from other Project elements, in combination with other plans and projects is provided in:

- NIS for Irish Project elements below the High Water Mark, and Irish elements offshore, accompanying a foreshore licence application to the Department of Housing, Local Government, and Heritage (Volume 6B);
- Habitats Regulations Assessment (HRA) Stage 1 Screening Report (equivalent to AA Screening Report) for Project elements in UK waters, all of which are offshore. The HRA Stage 1 Screening Report will accompany a marine licence application to the UK Marine Management Organisation, and will be publicly available online at https://www.gov.uk/check-marine-licence-register); and,
- Evaluation des incidences Natura 2000 (equivalent to NIS) for French based elements of the Project which are both onshore and below the High Water Mark, accompanying RTE's application to the French competent authorities, and which will be publicly on a project website established by RTE.

1.3 Requirement for Appropriate Assessment

1.3.1 European Law

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('the Habitats Directive') is European Community legislation aimed at nature conservation.

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a European site (s), (and where the plan or project is not directly connected with or necessary to the nature conservation management of the European site), the plan or project will be subject to 'Appropriate Assessment' (AA) to identify any implications for the European site(s) in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

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 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.

Case law of the European Court of Justice (ECJ) has determined that AA is required, if likely significant effects cannot be excluded on the basis of objective information. Case law has also clarified that measures intended to avoid or reduce harmful effects on European sites, must not be considered when determining whether it is necessary to carry out an AA.

1.3.2 Irish Law

In the context of the Proposed Development, the Habitats Directive is transposed into Irish law by Part XAB of the Planning and Development Act 2000 (as amended) ('the Planning Acts'), and the Planning and Development Regulations 2001 as amended ('the Planning Regulations').

Under Section 177U (1) of the Planning Acts, a screening for AA of the Proposed Development shall be carried out by the competent authority (in this case, An Bord Pleanála) to assess in view of best scientific knowledge, if that Proposed Development, individually or in combination with other plans or projects, is likely to have a significant effect(s) on any European sites.

Under Section 177U (5) of the Planning Acts, the competent authority (in this case, An Bord Pleanála) shall determine that an AA of a Proposed Development is required if it *cannot be*

excluded [emphasis added], on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site(s).

AA is the process provided for under Article 6 (3) of the Habitats Directive to determine whether a project or plan could 'adversely affect the integrity' of any European sites, either alone or in-combination with other plans or projects, in light of the conservation objectives of the European sites in question.

Under Section 177V (1), An appropriate assessment *shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or Proposed Development would adversely affect the integrity of a European site*

Under Section 177V (2), the competent authority (in this case, An Bord Pleanála) shall, in carrying out an appropriate assessment under subsection (1*), "take into account each of the following matters:*

a. the Natura impact report or Natura impact statement, as appropriate;
b. any supplemental information furnished in relation to any such report or *statement;*
c. if appropriate, any additional information sought by the authority and furnished *by the applicant in relation to a Natura impact statement;*
d. *any additional information furnished to the competent authority at its request in relation to a Natura impact report;*
e. *any information or advice obtained by the competent authority;*
f. *if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for Proposed Development;*
g. *any other relevant information."*

1.4 Definitions

1.4.1 European sites and features

A network of European sites of conservation importance has been identified by each Member State, hosting habitats and/or species identified in the Directives as needing to be either maintained at or returned to 'favourable conservation status'.

The sites of conservation importance known as European sites comprise the Natura 2000 network.

Part of the Project is located within the United Kingdom's Exclusive Economic Zone (EEZ). In this regard, it is acknowledged that following the United Kingdom's departure from the European Union, SACs and SPAs in the UK are no longer considered "European sites" for the purpose of an assessment pursuant to Article 6(3) of the Habitats Directive. However, pursuant to the UK's Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, those sites still retain the same protection under UK law as they did prior to the UK's exit from the EU. In line with Ireland's obligations as a signatory to the Bern Convention on the Conservation of European Wildlife and Natural Habitats, to which Directive 92/43/EEC and Directive 2009/147/EC give effect, and in order to ensure the highest level of protection for the species and habitats protected by those Directives, the assessment includes a full assessment of the UK sites formerly forming part of the network of sites protected under those Directives (wherever such sites are relevant). This will enable the competent authority to ensure that there will no adverse effect on the integrity of those UK sites.

In Ireland, European sites comprise areas designated as Special Areas of Conservation (SACs) and/or Special Protection Areas (SPAs). The process of designating cSACs as SACs is ongoing in Ireland. Candidate sites (In Ireland, comprising cSACs) have the same legal protection as those whose designation is complete.

The designation features of SACs are referred to as Qualifying Interests (QIs), and these comprise both species (excluding birds), and habitats.

The designation features of SPAs are referred to as Special Conservation Interests (SCIs), and these comprise bird species, as well as wetland bird habitats.

The designation features of European sites are identified in the Statutory Instruments for European sites where such sites have completed the designation process. In all cases, designation features are also identified in Conservation Objectives published by the NPWS. Any Conservation Objectives referred to in this NIS are referenced to identify the date of publication and version number.

1.4.2 Favourable Conservation Status

Article 1 of the Habitats Directive states that favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

Article 1 of the Habitats Directive states that the favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

1.4.3 Natura Impact Statement

Under Section 177T of the Planning Acts (177T), a Natura Impact Statement (NIS) is defined as:

"*A statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a Proposed Development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites*".

The NIS must "*include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites*".

Statement of Competence are provided below.

1.4.3.1 Statement of Competence

Authors

- Dr Erin Johnston (Senior Ecologist, Mott MacDonald). Erin is an Ecologist with eight years of post-graduate experience including three years in malacological research and four years in

Ecological consultancy. She has prepared Ecological Impact Assessments, and Appropriate Assessments Screening Reports (Habitat Regulations Assessment Report) for a variety of projects. Erin has experience carrying out field surveys for protected gastropods, along with vegetation, extended phase 1 habitat surveys, and targeted invasive species surveys. Other protected species surveys Erin has experience of include smooth newt, crayfish, badger, otter, marsh fritillary and bats.

- Roger Macnaughton MCIEEM (Principal Ecologist. Mott MacDonald). Roger is a qualified and experienced environmental consultant specialising in ecology. He has over nineteen year's professional experience in the environmental consultancy sector and an additional seven years of primarily research-based experience in freshwater and marine ecology. He specialises in the delivery of Ecological Impact Assessment (EcIA) and Appropriate Assessment (AA) for a broad range of projects potentially affecting; terrestrial, freshwater and marine ecology. His project related experience to date includes; two 400kV overhead lines, five 110kV overhead lines, overhead line up-rates, electricity substations, underground power cables, 35 terrestrial wind farms, two marine wind farms and five solar farms.

Surveyors

- Walkover surveys, mammal, and bat surveys were conducted by Dr Erin Johnston of Mott MacDonald.
- Specialist botanical surveys of the Converter Station Site were carried out by Dr John Conaghan. John has over 20 years' experience as a botanist and ecological consultant.
- The fisheries assessment was carried out by Ross Macklin of Triturus Environmental Ltd. Ross is an environmental scientist who specialises in freshwater and fisheries ecology. He has over 16 years professional experience and his expertise includes aquatic invertebrate and macrophyte studies in addition to fisheries quantification in a variety of surface water habitats.

- Winter bird surveys between February and March 2019 were carried out by David Rees MCIEEM. David Rees has more than 30 years' experience of working in ecology and nature conservation. Previously he worked for the Royal Society for the Protection of Birds (RSPB) in the UK, running nature reserves. He has worked as a consultant ecologist since 2006, working for two different engineering companies before establishing his own company in 2011, specialising in ornithological surveys and assessment. He is a full member of the Chartered Institute of Ecology and Environmental Management.
- Winter bird surveys between November 2019 to March 2020, and breeding bird surveys between April and June 2019, and April to June in both 2019 and 2020 were undertaken by Tony Nagle. Tony Nagle has a BSc in Environmental Management, an MSc in Ecological Assessment and is a member of the Chartered Institute of Ecology and Environmental Management. He has over 29 years of experience in bird surveying including birds of prey, waders, wildfowl and nocturnal species. He has been involved in Barn Owl conservation (surveying, monitoring, nestbox erection and ringing) in County Cork since 1992. He was a regional organiser of the 2005, 2010 and 2015 National Hen Harrier Surveys and a co-author of each of the reports and he was a regional organiser and validator for the *Bird Atlas*. He has been involved in numerous surveys for wind energy, road construction and pipe-laying projects and he has designed and evaluated many of these surveys.
- Winter bird surveys between October 2020 to March 2021 Were carried out by Dr Allan Mee. Allan is an ornithologist with over 35 years professional experience working in Ireland, UK and USA on projects from endangered species conservation to population surveys of waterbirds and raptors. He has managed the reintroduction of White-tailed Eagles to Ireland since 2007 as well as working as project scientist on the EU LIFE funded Raptor LIFE project (2018-2020) in NW Cork.

1.5 Structure of this Report

The findings of this assessment are documented in this report. The structure of this report includes the following elements:

- Chapter 2: Screening for Appropriate Assessment
  - Section 2.1 Management of the European site(s)
  - Section 2.2 Overview of the Baseline Environment
  - Section 2.3: Description of the Proposed Development
  - Section 2.4 European sites in the Zone of Influence
  - Section 2.5: Plans and Projects Which Might Act in Combination
  - Section 2.6: Summary of Potentially Significant Effects
  - Section 2.7 Screening Outcome
- Chapter 3: Natura Impact Statement
  - Section 3.1 Description of the Development
  - Section 3.2 Description of the Receiving Environment
  - Section 3.3 Impact Prediction
  - Section 3.4 Potential for Adverse Effects on Site Integrity (including in-combination effects)
  - Section 3.6 Mitigation Measures

1.6 Methodology

This report has been prepared having regard to European Commission and Irish departmental guidance on AA methodologies including :

- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice C (2018) 7621
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010)[1].

This report has similarly been prepared with regard to relevant rulings by the ECJ, and the Irish courts.

1.6.1 Desktop Data

This assessment includes a desk-based review of available records of protected species and habitats including the following sources:

- Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;

European site documentation including Conservation Objectives, National Parks and Wildlife Service (NPWS)

- NPWS Site Synopses and, Natura Standard Data Forms, and available from NPWS;
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, and
- Existing relevant mapping and databases e.g. waterbody status, species and habitat distribution etc. (sourced from the Environmental Protection Agency - http://gis.epa.ie/, the National Biodiversity Data Centre - http://maps.biodiversityireland.ie and the National Parks and Wildlife Services - http://www.npws.ie/mapsanddata/,

1.7 . Field Survey Data

Walkover Surveys

Field surveys were carried out subject to landowner agreement and were also constrained by Covid 19 restrictions. Walkover surveys of the landfall site, cable route, and Converter Station were conducted on 29 May 2019, and on the following dates in 2020: 26 August, 1 September, 8 September, 9 September, 29 September, 6 October, 7 October, 8 October, 13 October, 14 October, 27 November and 4 December.

Habitat and plant surveys of the Proposed Development were carried out by Mott MacDonald, with bespoke specialist botanical surveys carried out by Dr John Conaghan of BES within the Converter Station site and wider Ballyadam / IDA site only (See Section 1.4.3.1).

Where third party access and Covid 19 restrictions allowed close inspection (See Section 1.9), habitats were classified to level three according to the scheme outlined in “A Guide to Habitats in Ireland”(Fossitt, 2007).

Fit to European Annex 1 habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) having regard to the Irish Vegetation Classification[2].

[1] Updated Irish departmental guidance had been procured at the time of writing, but was not available.

[2] ERICA - Biodiversity Ireland

Habitat survey methods had regard to '*Best Practice Guidance for Habitat Survey and Mapping'* (Smith et al., Heritage Council, 2011).

During site walkovers searches were conducted for Invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended.

Where access was not possible, assessment was carried out through assessment of aerial photography of the relevant areas.

Bespoke field surveys were not conducted for a variety of Annex II species who are absent from the ZoI of the Proposed Development (as defined in Section 2.4.1), either because suitable habitats were absent, or because the species have restricted distributions and are known not to occur based on desktop data (including Favourable Reference Range and Current Range in NPWS (2019a, 2019b). These species, for which field surveys were not required, were:

- Lesser horseshoe bat *Rhinolophus hipposideros,* whose populations are restricted to the western Atlantic seaboard, and whose nearest occurrence is 35 km west of the Proposed Development site;
- Freshwater pearl mussel *Margaritifera,* because the Proposed Development does not occur within any of the known catchments for the species identified by the NPWS
- Marsh fritillary *Euphydryas aurinia*, since bespoke habitat surveys for the Proposed Development confirmed absence of the larval foodplant *Succisa pratensis* within the footprint and environs of the Proposed Development;
- Kerry slug *Geomaculosus maculosus,* whose distribution in Cork is restricted to the west of the County (NPWS, 2019a, 2019b);
- All other Annex II species whose Favourable Reference Range does not overlap the ZoI of the Proposed Development, as identified in NPWS (2019a, 2019b).

Aquatic Surveys

A broad aquatic habitat assessment was conducted at each site utilising elements of the methodology given in the Environment Agency's *'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2007*' (EPA 2003) and the Irish Heritage Council's *'A Guide to Habitats in Ireland*'. (Fossitt 2007) All sites were assessed in terms of:

- A fisheries habitat appraisal;
- Stream width and depth and other physical characteristics;
- Substrate type, listing substrate fractions in order of dominance, i.e. bedrock, boulder, cobble, gravel, sand, silt, etc.;
- Flow type, listing percentage of riffle, glide and pool in the sampling area;
- Habitat types following *'A Guide to Habitats in Ireland*' including riparian vegetation composition;
- Percentage coverage at the sampling sites, of in-stream macrophytes, and bryophytes (i.e. non-flowering plants, specifically mosses and liverworts to assess potential presence of such species on the Irish Red List (Lockhart et al. 2008));
- Flowering plants of conservation interest;
- Invasive plant species scheduled to the Birds and Natural Habitats Regulations ;
- Habitat suitability assessment for white-clawed crayfish *Austropotamobius pallipes* and biological water quality sampling (Q-sampling); and,
- Presence of otter

This holistic approach informed the overall aquatic ecological evaluation of each site in context of the proposed development and onshore cable route.

The watercourse / waterbody at each aquatic survey site was described in terms of the important aquatic habitats and species. This helped to evaluate species and habitats of ecological value in the vicinity of the proposed onshore cable route layout and watercourse crossings.

Wintering Bird Surveys

Wintering bird surveys consisted of:

- Wetland bird surveys at high and low tide, at Claycastle Beach in February and March 2019, monthly from November 2019 to March 2020; and monthly from October 2020 to March 2021.
- Marine bird surveys at Claycastle beach monthly from November 2019 to March 2020; and monthly from October 2020 to March 2021.
- Line-transect surveys at Ballyadam monthly from December 2019 to March 2020; and,
- Winter raptor roost surveys at Ballyvergan Marsh monthly in February and March 2019, and from November 2019 to March 2020 and monthly from October 2020 to March 2021.

Wetland Bird Surveys

Wetland bird surveys were carried out at Redbarn-Claycastle over three winter seasons. During both seasons, the survey area was sub-divided into 5 sections. These are indicated in red below in Figure 1.1. In all wetland bird surveys, the survey areas for intertidal birds (Sections 1-5) extended up to 1.5 km from the proposed landfall works. The proposed works at Claycastle beach are located in the vicinity of yellow ‘VP’ annotation in Figure 1.1. The survey area was significantly greater than the estimated ZoI for disturbance of c. 400m to inform an understanding of bird distribution in the wider area.

Figure 1.1: Redbarn-Claycastle Beach showing Ballyvergan marsh (brown) and the five count sections. The proposed works are adjacent to the 'Vantage Point' (VP) location; the marine bird survey area is indicated by a yellow box.

Nearby fields that were also used by some wetland bird species were included in the counts as were wetland birds seen in Ballyvergan Marsh. Using Irish Wetland Bird Survey (IWEbS) methodology, bird counts of fields were carried out within two hours either side of high tide.

To gain a better understanding of bird usage at these sites, low-water counts were also conducted within a two hour period either side of low water[3]. Surveys were carried out over three winter seasons to capture variability in bird usage due to weather and human disturbance. Normally these surveys would commence in September but, due to the timing of commissions and other factors:

- The first winter survey season was not commissioned until February 2019 so these surveys commenced in February 2019 and ended in March 2019 (2 survey months).
- The second winter survey season was not commissioned until November 2019 so these surveys commenced in November 2019 and ended in March 2020 (5 survey months).
- The third winter survey season commenced in October 2020 and ended in March 2021 (6 survey months)

In an attempt to assess levels of human disturbance at Redbarn-Claycastle, numbers of walkers and their dogs were recorded on each of the counts (apart from High Tide counts in March).

[3] Lewis, L. J. and Tierney, T. D. (2014) Low tide waterbird surveys: survey methods and guidance notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Marine Bird Surveys

Marine bird surveys were undertaken at Claycastle Beach over one season; each month between November 2019 and March 2020. The marine bird survey area is shown in Figure 1.2. The species totals refer to sightings of birds flying past or landing within the designated survey area (a c. 420 metre wide area of shoreline and sea extending c. 450 metres from the shore). This survey consisted of three, hour-long dedicated counts of all seabirds recorded using or passing through the site of the proposed landfall at high tide, mid-tide and low-tide. In contrast to the intertidal and inland surveys, the counts of marine birds are cumulative totals, summed over the duration of each survey ('daily totals').

Line Transect Bird Surveys

Line-transect winter bird surveys were carried out over one season; monthly at the wider Ballyadam/IDA site, between December 2019 and March in Figure 1.2.

Figure 1.2: Wider Ballyadam/IDA site showing the winter bird survey transect (red line)

The surveys were based on the British Trust for Ornithology English Winter Bird Survey Guidelines (BTO 2019). Most visits were undertaken in the morning between 6.20 am and 10.30 am. Defined transects were walked on each occasion and all birds seen and heard within the survey zone were recorded. Access difficulties in December 2019 restricted counts to vantage points on the north and west perimeters.

Raptor Winter Roost Surveys

Winter raptor roost surveys were carried out from Vantage Points overlooking at Ballyvergan Marsh over two seasons; in February and March 2019, and from November 2019 to March 2020. This methodology had regard for the Irish Hen Harrier Winter Survey Guide [4], as well as Gilbert et al.[5]. Surveys took place from approximately one hour before sunset until dusk.

[4] Available online from http://www.ihhws.ie/IHHWS_Guide.pdf

[5] Gilbert G, Gibbons D. W. and Evans J. (1998). Bird Monitoring Methods, a manual of techniques for key UK species. RSPB

1.8 Consultation

1.8.1 National Parks and Wildlife Services (NPWS)

1.8.1.1 16 December 2020

Written correspondence was sent to the Development Application Unit (DAU) for the attention of NPWS in November 2020 providing an overview of the Proposed Development and requesting any additional information on nature conservation and biodiversity within the receiving environment.

A response was received on 16 December 2020. The full response is provided in Appendix A. The Department noted the following specific comments of relevance to the AA Screening and NIS:

- Most of the Proposed Development was away from any designated areas or areas of known conservation importance;
- The proposal to route the underground cable within existing public roads is welcomed as this reduces potential ecological impacts;
- Subject to more detailed assessment at the application stage and the findings of the EIA and NIS, the Department is at this time satisfied that most of the terrestrial cable route is unlikely to cause significant ecological concern provided proper mitigation measures are implemented.

The Department also included in the response the following requests:

- That mitigation measures related to watercourses be incorporated to protect watercourses and associated species.
- That otters be surveyed for at bridges and river crossings and impacts mitigated.
- That surplus materials derived from excavations be disposed of only at pre-approved licensed facilities.
- Due to concern about traversing the eastern edge of Ballyvergan Marsh pNHA for a section of up to approximately 200m in length, a full ecological assessment of the potential impacts at this location will need to be carried out and any negative impacts avoided or compensated for.
- It is noted that the proposed cable route passes adjacent to Lough Aderry and Ballybutler pNHA (site code 0446) and the EIA should assess any potential impacts to this site.
- The Department would recommend the cable route be contained within the existing road way to reduce any potential for negative effects
- That the potential for disturbance to wintering bird species be assessed.
- That a Natura Impact Statement document be included with application for consent.
- That an assessment on marine mammals be made as to the potential for interaction with marine mammals.

1.8.1.2 15 January 2020

A Webex meeting was held between EirGrid, EirGrid's Consultants, and the NPWS on the 15 January to further discuss the written request of 16 December 2020.

The following notable observations/actions were recorded by EirGrid, as applicable to this AA Screening Report and NIS:

- NPWS queried whether the current Converter Station Site proposals for sealed tanked drainage could incorporate some element of open water wetland with the dual purpose of water storage and biodiversity

  EirGrid agreed to discuss with the design team, who subsequently advised on 19 January, that whilst open water was potentially feasible, the sealed system presented significant advantages over open water, in terms of available storage capacity within a given footprint.
- EirGrid confirmed an Ecological Clerk of Works would be appointed for the Proposed Development.
- NPWS raised a historical concern with storage of excess soils generated during construction, by third party landowners.

  EirGrid responded that such activities would be fully assessed, to ensure compliance with relevant waste legislation, and to protect sensitive areas.
- NPWS Marine specialist advised that impacts to marine mammals may be greatest in bays near Youghal. EirGrid confirmed a Marine Mammal Observer would be employed by the Contractor for the entirety of marine works.
- NPWS Marine specialist advised that noise modelling, not available at the time of the meeting, would need to inform marine environmental assessments including impacts to marine mammals.
- Potential impacts mitigation and/or compensation potentially applicable to Ballyvergan Marsh, were discussed. EirGrid advised that Cork County Council owned these lands and committed to exploring practical enhancement measures in the pNHA in the course of the planning application. Mitigation measures discussed included seasonal works and reducing the footprint of the HDD launch and reception pits within the marsh.

1.8.2 Inland Fisheries Ireland (IFI)

A meeting was held with IFI on 14 January 2020. During the meeting the general development was outlined to IFI. During the meeting IFI noted the following:

- Horizontal Directional Drilling (HDD) would be preferential as it avoids instream works.
- Pearl mussel are unlikely to be a concern within the study area.
- Invasive species are in the area.
- There is currently no evidence of crayfish plague although this may change.

Written correspondence was sent to IFI in October 2020 including details of aquatic surveys carried out. IFI responded noting:

- HDD is preferential to open trenching.
- Any element of work requiring instream works should be limited to the fisheries open season.
- Where open trenching is proposed provision should be made for site restoration post work e.g. river bank stabilization and gravel replacements.

Written correspondence was sent to IFI in November 2020 providing an update on the Proposed Development and requesting any views that IFI might have in relation to the development. A response was received in December stating that IFI would assess the details of the proposed scheme at the planning stage.

1.8.3 Cork County Council

Consultation with Cork County council has been ongoing throughout the development of the Proposed Development. Written correspondence was sent to Cork County Council in November

2020. This provided an update on the Proposed Development and invited views on the proposals and the opportunity to discuss the content of the applications.

A response was received in December 2020 noting that a separate response would be issued in relation to the Proposed Development. No further responses have been received to date.

A meeting was held between EirGrid, EirGrid's Consultants and the Ecology office of the Ecology Office of Cork County Council on the 18 February.

Key matters discussed and actions arising are set out below under different location headings; only matters of potential relevance to the AA Screening and NIS are included (specifically, comments on Ballyvergan marsh, which provide ex-situ habitat to wintering birds of SPAs).

- EirGrid clarified there would be no significant loss of wetland habitat, as existing large depressions within site did not hold water and drained freely
- EirGrid advised of discussions with CCC policy team who are aligned with national and regional policy in so far as it concerns interconnectors

1.8.3.1 Ballyvergan

- Ecology office of CCC noted that EirGrid / MMD don't predict permanent impact to the pNHA
- Enhancement was discussed, in terms of landownership, specificity of planning commitments, interaction with the consented Middleton-Youghal Greenway, option to leave open water (versus potential negative effects of same on drainage / flooding), and the variety of ecological features to consider (including reed warbler, hen harrier, reedbeds).
- Ecology office of CCC requested that EirGrid seek agreement of Ballyvergan Marsh pNHA enhancement objectives with stakeholders.
- CCC Ecology stated concerns about any proposals for mitigation outside the red line boundary, as it would be difficult to enforce compliance with same if an issue arose.
- CCC Ecology stated it would be preferable to incorporate habitat mitigation proposals within the red line boundary.
- CCC Ecology would need to see land owners approval and consent for any proposals outside the red line boundary if same were to form part of the application.

1.9 Limitations

Due to Covid-19, and limitations due to the associated restrictions, not all offline areas (i.e. area outside of the existing road curtilage) within the potential zone of influence have been subject to a walkover survey.

Areas where works are required outside of the road curtilage that could not be surveyed are outlined below in Table 1.1**:** Areas Not Accessed

.

Table 1.1: Areas Not Accessed

Location	Features	Likely Habitats in footprint
Route Section AC01-AC02	Passing bay	Agricultural grassland
Route Section AC02-AC03	Offline section	Agricultural grassland
Route Section AC03-AC04	6 passing bays	Agricultural grassland
Route Section AC04-AC05	Passing bay	Agricultural grassland
Route section AC05 -AC06	6 passing bays	Amenity grassland and agricultural grassland
Route section AC06-AC07	Passing bay, Offline section Compound area	Agricultural grassland
Route section DC01-DC02	4 passing bays, and a laydown area	Agricultural grassland
Route Section DC02-DC03	4 passing bays, offline section laydown area	Agricultural grassland
Route section DC03 -DC04	2 passing bays	Agricultural grassland
Route section DC04 -DC05	3 passing bays, Offline section Laydown area	Agricultural grassland
Route section DC07-DC08	An offline section, Passing bay	Agricultural grassland
Route section DC09-DC10	Two temporary compounds for HDD crossing, One laydown area	Agricultural grassland

Based on aerial photography, desktop ecological data, and views from publicly accessible areas, inaccessible habitats within the footprint of the works are likely to comprise agricultural and amenity grassland. Both are low in terms of value to biodiversity. As such, the information gathered during the field assessment is considered robust.

Surveys in the highest quality habitats (i.e. Ballyvergan Marsh, the proposed Converter Station footprint within the wider Ballyadam/IDA site, and aquatic habitat surveys at water crossings), and the Knockraha substation, were undertaken during the optimal season, and over two seasons. Most surveys of the cable route took place outside of the optimal season for vegetative survey (i.e. surveys were carried out from October to December instead of the optimal April to September window), which was unavoidable due to a combination of Covid-19, and third party land access restrictions. Targeted surveys were conducted in May 2021 of parts of the cable route and May is within the vegetative growing season. Overall, this did not compromise the quality of relevant data gathered to inform this NIS, deemed to constitute best available scientific knowledge in the field, and did not create lacunae or result in non-definitive findings.

Wintering bird surveys were conducted during the optimal time of year, over three seasons, in areas with potential to host Special Conservation Interest populations (Claycastle, Ballyvergan, the proposed Converter Station site, and the wider Ballyadam / IDA site). Areas requiring wintering bird survey were identified through a combination of proximity to the Proposed Development (and Zone of Influence of same), habitat distribution based on field and desktop data, and professional judgement. While every effort was made to do so, it is of note that recording the exact number of hen harrier can sometimes be difficult as some birds alight after settling (often unnoticed) and may leave the roost site only to return again later.

2 Screening for Appropriate Assessment

2.1 Management of European sites

The Proposed Development is not directly connected with or necessary to the 'management' of European sites within the Natura 2000 Network having regard to Article 6 of the Habitats Directive. As such it is appropriate that the Proposed Development is subjected to screening for AA.

This screening assessment investigates, in view of best scientific knowledge, whether the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on European sites. This report considers the likelihood of significant effects on European sites from the construction, operation, and decommissioning of the Proposed Development. The submarine circuit (cable) between Claycastle Beach in Youghal, County Cork Ireland and the Ceinture Dorée (Gold Belt) coast in Brittany France are addressed under in-combination effects in this report. Overview of the Proposed Development

A summary of the overall Celtic Interconnector Project (the Project) has been described in Section 1.1. The main elements of the Proposed Development (within the overall Project) which are the focus of this AA screening and NIS are:

- Landfall infrastructure at Claycastle above the HWM
- An HVDC underground cable (UGC) between the landfall location (Claycastle) and a Converter Station compound in Ballyadam;
- A Converter Station at Ballyadam to convert the electricity from HVDC to HVAC and vice versa;
- A HVAC UGC between the Converter Station at Ballyadam and the connection point to the National Grid at the existing Knockraha 220 kV; and,
- A connection to the National grid (and associated transmission infrastructure) within the existing Knockraha 220 kV;

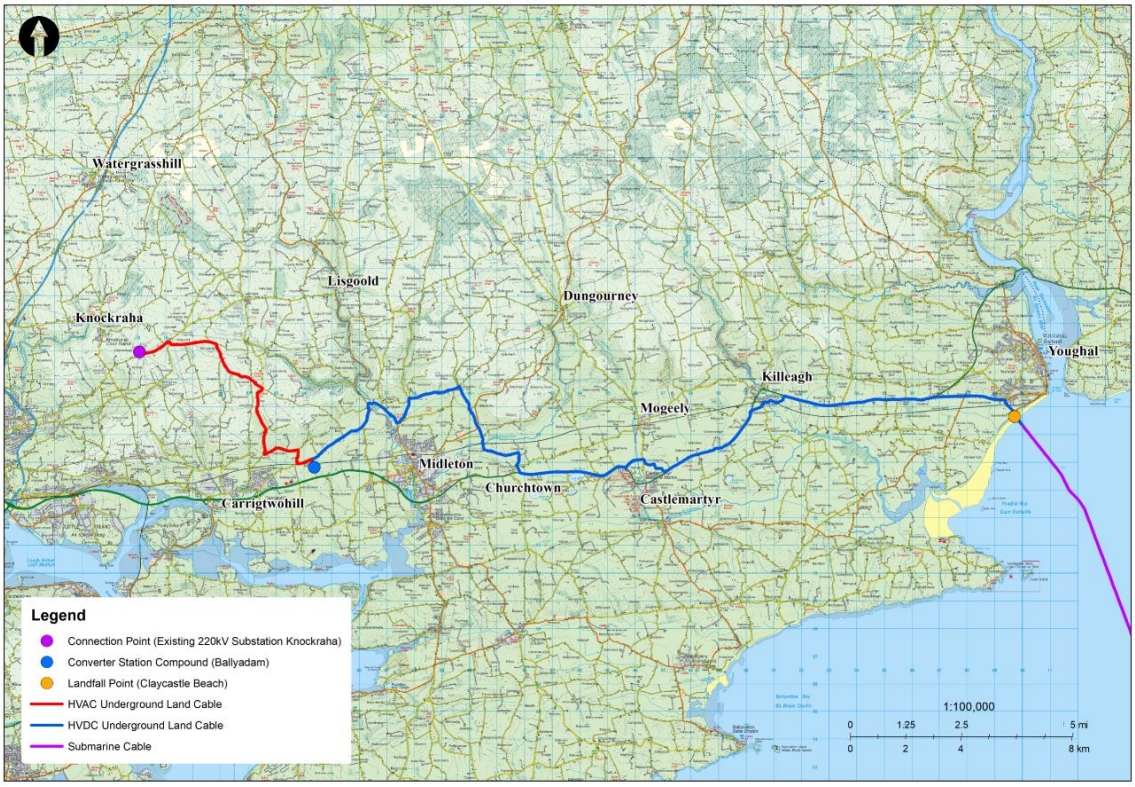
A fibre optic link, with associated power supply, will also be laid along the route for operational control, communication and telemetry purposes.

Figure 2.1: The Figure 2.1 below illustrates the main elements of the Proposed Development, indicated as yellow point (landfall infrastructure above HW mark), blue line (HVDC cable route), blue point (Converter Station), red line (HVAC cable route), and purple dot (Connection Point). The submarine cable component of the Project is also shown (purple line).

Table 2.1: Route Sections provides a description of these locations. For ease of reference, the route section nomenclature detailed in Table 2.1 has been assigned to both the HVAC (AC) and HVDC (DC) routes between the connection point and the Converter Station (AC) and between the Converter Station and the landfall interface area at Claycastle Beach (DC). These references are used throughout this document.

Planning drawings of the Proposed Development are provided in Volume 1B of the overall Planning Application.

Figure 2.1: The Proposed Development



Source: Mott MacDonald

Table 2.1: Route Sections

Route Section Name	Route Section Descriptor (and Townland)
The Proposed Development	
Connection Point	Knockraha Substation (Ballynanelagh)
AC01-AC02	Knockraha Substation (Ballynanelagh) to east of Ballynanleagh (Killeena)
AC02-AC03	East of Ballynanleagh, west of T-Junction (Killeena) to East of Ballynanleagh, east of T-Junction (Killeena)
AC03-AC04	East of Ballynanleagh, east of T-Junction (Killeena) to Garranes crossroads (Garranes)
AC04-AC05	Garranes crossroads (Garranes) to south of Woodstock (Woodstock)
AC05-AC06	Woodstock (Woodstock)/Gortnamucky to north of Ballyadam (Ballyadam)
AC06-AC07	North of Ballyadam (Ballyadam) to Ballyadam (Ballyadam)
Converter Station Site	Ballyadam (Ballyadam)
DC01-DC02	Ballyadam (Ballyadam) to Carrigogna/R626 (Carrigogna)
DC02-DC03	Carrigogna (Carrigogna) to Ballyspillane East (Ballyspillane East)
DC03-DC04	Ballyspillane East (Ballyspillane East) to Roxborough (Roxborough)
DC04-DC05	Roxborough (Roxborough) to Churchtown North / N25 (Ballyedekin)
DC05-DC06	Churchtown North (Ballyedekin) to West of Castlemartyr (Killamucky)
DC06-DC07	West of Castlemartyr (Killamucky) to East of Castlemartyr (Clasharinka)
DC07-DC08	East of Castlemartyr (Clasharinka) to West of Killeagh (Mountbell)

Route Section Name	Route Section Descriptor (and Townland)
DC08-DC09	West of Killeagh (Mountbell) to east of Killeagh (Ballymakeagh More)
DC09-DC010	Killeagh (Ballymakeagh More) to N25/west of R634 (Ballyvergan West)
DC10-DC011	Ballyvergan West (Ballyvergan West) to R634 / R908 (Summerfield)
DC11-DC012	R634 / R908 (Summerfield) to the Transition Joint Bay north of Claycastle Beach car park (Summerfield)
DC012 – HWM	The Transition Joint Bay north of Claycastle Beach car park (Summerfield) to the HWM (Summerfield)
Other Elements of the Celtic Interconnector Project	
Landfall Area	HWM (Summerfield) to Claycastle Beach (Summerfield) and Offshore

2.2 Overview of the Baseline Environment

A high-level description of the different sections of the Proposed Development and the habitats encountered therein is provided below in Table 2.2. The location references correspond to sections of the proposed cable route and are provided along with habitat maps of the Proposed Development in Appendix B.

For the avoidance of doubt, note the Proposed Development does not overlap or adjoin any European sites. As such the habitat descriptions below are provided only to facilitate the potential for lands directly impacted to support mobile species of European sites. The potential for habitats in the wider area, beyond the footprint, to offer habitat for mobile species is captured in Section 2.4.2 of the AA Screening part of this document.

Table 2.2: Habitat types within the Footprint of the Proposed Development

Location	Habitats Within Footprint of the Proposed Development
Knockraha Substation	• To the west of the substation the laydown area is located within existing hard standing (BL3) and scrub (WS1). • To the east of the existing substation (BL3), the footprint of the substation is within improved and managed agricultural grassland (GA1), and hedgerow habitat (WL1).
AC01-AC02	• Cable route is entirely within the road (BL3). • Passing bay footprint is within improved agricultural grassland (GA1) and hedgerow habitat (WL1).
AC02-AC03	• Cable route leaves the existing roadway (BL3), running along the edge of an agricultural grassland field (GA1). The cable route crosses two treelines (WL2) and enters into another field containing agricultural grassland (GA1). The route then re-enters the existing roadway.
AC03-AC04	• This long stretch of cable is entirely within the existing roadway (BL3). • Six passing bays are located adjacent to the roadway along this section. The passing bays are all located within improved agricultural grassland (GA1) bordered by hedgerows (WL1). • One crossing of a drainage ditch (FW4) is required.
AC04-AC05	• The cable is located entirely within the existing roadway (BL3). • Two passing bays are required along this section of the route. The first is located within agricultural field (GA1) with treeline border (WL2). • The second passing bay is located within an area of hazel dominated woodland (WN2) which has a stream (FW1) running parallel to the road. • One crossing of a drainage ditch (FW4) is required.
ACO5-AC06	• The cable route is located entirely within the existing roadway (BL3). • Three laydown areas are proposed within agricultural field (GA1) bordered by hedgerows (WL1). One laydown area (LDA-AC02) is bordered by a flowing drainage ditch. • Two crossings of drainage ditches (FW4) are required.
AC06-AC07	• The cable route runs within the existing road (BL3) before entering into agricultural grassland (GA1) to the south of the road and crossing the existing railway line (BL3).

Location	Habitats Within Footprint of the Proposed Development
	• A passing bay is located within the agricultural grassland (GA1) to the north of the existing road.
Converter Station Site	• The cable route passes through a bank of scrub (WS1) where it enters into the Converter Station site. • The Converter Station site is comprised of recolonising bare ground (ED3) transitioning into calcareous grassland (GS1), sparsely vegetated bare ground (ED2), scrub (WS1), and the existing internal roads (ED2). A small wetland feature is also present within the footprint of the converter site. A small proportion of the GSI qualifies as Priority Annex 1 6210* orchid-rich semi-natural grassland [unrelated to European sites].The Converter Station Site is known to have a karst geology and the potential for underground conduits has been identified at this location.
DC01-DC02	• This long stretch of cable is located predominantly within the existing roadway (BL3). • The cable route exits the Converter Station through the bank of scrub (WS1) and crossing the railway line (BL3) through a field of agricultural grassland (GA1), and into the road. • The cable exits the road and crosses a hedgerow to enter a tillage field (BC3). The cable then crosses the Owenacurra river (FW1), a treeline (WL2) and enters into a field of agricultural grassland (GA1). • The cable route exits the field through the end of a treeline (WL2) and enters back into the existing road (BL3). • Five passing bays are located along this stretch of cable, all within agricultural grassland (GA1) bordered by hedgerows (WL1). • One laydown area is proposed within a field of agricultural grassland (GA1). • Three drainage ditches (FW4) require crossings
DC02-DC03	• The cable route exits the roadway through a treeline (WL2) and enters into an area of wet grassland (GS4) adjacent to the Owennacurra River (FW1). • The cable exits the wet grassland into an agricultural field (GA1). It then crosses the Owencurra River (FW1) which is bordered by two treelines (WL2), into an area of amenity grassland (GA2) before crossing an additional treeline (WL2) and entering back into the road (BL3). • The cable exits the road again at Gortacrue to facilitate crossing a gas line. The cable enters into a field of agricultural grassland (GA1) crossing a hedgerow twice before re-entering the road. • Four passing bays are required along this stretch. All are located within agricultural grassland bordered by hedgerows (WL1) and treelines (WL2).
DC03-DC04	• The cable route runs along the existing roadway (BL3) before entering into a tillage field (BC3). The route crosses a treeline (WL2) into a field of agricultural grassland (GA1). • The cable route then crosses two treelines (WL2), the Dungourney River (FW1), and scrub (WS1) before it enters into another field of agricultural grassland (GA1). • The cable route then exits back into the road (BL3) through a hedgerow (WL1).
DC04-DC05	• This stretch of the cable route is entirely within the existing roadway (BL3). • Four passing bays are required along this stretch of the road. These are all located within fields of agricultural grassland (GA1) bordered by hedgerows (WL1) and treelines (WL2). • A laydown area is required within an additional area of agricultural grassland (GA1). • One drainage ditch (FW4) requires crossing
DC05-DC06	• This stretch of the cable is entirely within the northern verge of the N25. • A laydown area is located within a tillage field (BC3). • Two drainage ditches require crossings, • The boundary of the Loughs Aderry and Ballybutler pNHA (000446) extends into the road
DC06-DC07	• The cable route crosses a treeline (WL2) into a tillage field (BC3). • It then crosses through two treelines which border a drainage ditch (FW2), into an agricultural field (GA1), and crosses a series of watercourses (Drainage ditches (FW4) and a river (FW2) _ and treelines (WL2) into agricultural grassland (GA1). • After crossing the Mogeely road (BL3) the route navigates a series of agricultural fields bordered by treelines (WL2) and hedgerows (WL1) before crossing back into the existing roadway (BL3).
DC07-DC08	• The cable route continues along the Killeagh road (BL3) either within the existing roadway or the verge. • The cable route exits the roadway, crossing a hedgerow (WL1) to cross the Moanlahan river (FW1) before re-entering the road. • One passing bay is required within a field of agricultural grassland.

Location	Habitats Within Footprint of the Proposed Development
	• The boundary of Clasharinka Pong pNHA extends into the road at this location.
DC08-DC09	• The cable route crosses a hedgerow into a field of agricultural grassland (GA1). The cable route then exits the field across a treeline (WL2) and road into a tillage field (BC3). • The cable route then crosses a series of treelines (WL2), hedgerows (WL1), the river Dissour (FW2) (two crossings) and fields of agricultural grassland (GA1) before re-entering the N25 roadway (BL3).
DC09-DC10	• The route continues within the existing road (BL3) entering occasionally into the verge. • At Ballyvergan west the cable route crosses hedgerow (WL1) and enters into agricultural grassland (GA1) to avoid a cattle underpass before re-entering the road. • A laydown area is required at Gortroe cross within a field of Agricultural Grassland (GA1) • One crossing of the river Dissour, two crossings of the Womanagh river, and one crossing of the east Ballyvergan river are required.
DC11-DC12	• The route continues within the existing road before crossing into fields of wet grassland (GS4), Scrub (WS1) and reed swamp (FS1) associated with the Ballyvergan Marsh pNHA. • The cable re-enters the road (BL3) and until it reaches the landfall site.
Claycastle Landfall	• The landfall site is located within an area of fixed dune habitat (CD3) and the car park (BL3), before entering the foreshore.

2.3 Description of the Proposed Development

None of the measures in Section 2.3 are required to avoid or reduce harmful effects on European sites. Such mitigation measures are prescribed later in the NIS (Section 3.5).

2.3.1 Construction Phase Activities

2.3.1.1 Converter Station Construction

Prior to enabling works the identified Near Threatened plants and European protected habitat parcels, will be moved to a temporary storage area. In addition, the existing substation building to the north of the proposed converter station compound will be demolished.

The Contractor will conduct the works safely, in accordance with acceptable industry practices taking due consideration to constraints specific to the area where the drilling is to take place, including karst features. The converter station site will consist of a new engineered stone fill platform which will raise the proposed site level above its existing level. This will ensure that a gravity below ground closed drainage system can be accommodated.

Any poor ground (soft spots or contaminated areas) below the platform will be excavated and removed from site. Any waste arising will be managed in accordance with the Waste Management Act 1996 (as amended), and associated Regulations. All engineered stone fill for the new platform will be brought to site.

The completed platform will provide a stable base from which the proposed buildings and structures on site will then be constructed. As a worst-case, rotary bored cast-in-place reinforced concrete piles will likely be adopted for all foundations on this site. The site piling can commence as soon as a large enough area of platform is completed.

The site below ground drainage installation can commence on completion of the proposed platform. The access road drainage installation can commence on completion of the access road enabling works.

The construction of the proposed site access road can commence at the same time as the piling works. This will consist of removing all poor ground and any material from areas to be cut and removing this material from site.

A Contractors compound will be located in proximity to the converter station site boundary and will be located on an area of ground that will be temporarily surfaced with engineered stone and levelled. The compound will house the Contractor's cabins and areas for temporary storage of construction materials (excluding cut / fill ground, which will be brought directly to and from site with no need for temporary storage).

Construction of the reinforced concrete piled raft for all of the buildings and structures can commence once the piling is complete. The structures and building will then progress commensurate with typical construction practice, as follows;

- Steel frame for the buildings will be installed and fixed down to the piled raft slabs.
- The lightweight cladding to the roofs and walls will be installed and fixed back to the primary frames making the structures weather tight.
- The works within the buildings can then progress, including mechanical, electrical and plumbing (MEP) installation and building fit-out.

2.3.1.2 Laying of Underground Cable

The laying of underground cables is a standard construction technique undertaken by a range of utility and other services providers. Cables will typically be installed in two phases, as follows:

- Duct and joint bay installation; and
- Cable pulling and jointing

Duct and joint bay installation are the most construction-intensive and invasive elements of cable route installation, as digging of a trench will be required. For on-road cable laying, this phase will have the largest impact on traffic disturbance, including the potential need for rolling road closures (to through traffic) and diversions. While the specifics of any cable laying schedule are dependent upon the nature and location of the project, it is generally the case that cable ducts can be laid in a road at a rate of approximately 20m - 50m per day. Joint bays, generally located at intervals of 750 metres along the UGC route of the proposed development (shorter intervals occur where the route alignment is more complex), are typically installed in 1 – 2 days with the road fully reinstated post installation.

Road reinstatement along the route of the cable trench follows the completion of the trenching and ducting as it moves along the route. Cable pulling and jointing, which commence when the trenching and ducting is well advanced along the route, is executed from the joint bay locations. Where this activity would likely require a road closure to be undertaken, the provision of a passing bay at the location of the joint bay will facilitate through movement of traffic along the road by means of a single traffic signalled lane at the joint bay.

Figure 2.2 shows a typical trench in a public road for a pair of HVDC cables after installation of ducts and prior to back fill. Marker boards can be seen within the trench prior to final reinstatement. Figure 2.2 presents a reinstated road following laying of UGC.

Figure 2.2: Typical HVDC Cable Trench in Road

Source: EirGrid

Figure 2.3: Reinstated road following laying of underground cables (UGC)

Source: EirGrid

Duct Installation Typical

The UGC will be pulled into pre-installed ducts laid within a trench. When a trench length of approximately 20m to 50m has been excavated and temporarily supported, a layer of bedding material (sand, concrete or sand / cement mix) will be laid onto the base of the trench.

The ducts will then be installed onto the bedding in the correct arrangement, and the trench will be backfilled and compacted with thermally suitable back-fill material and marker boards for protection. Following duct installation, the road above the trench will be reinstated to match the

environment in which it is installed to the standard required by the relevant authority at that location, in this case Cork County Council or Transport Infrastructure Ireland (TII).

The duct installation will progress sequentially starting at one joint bay and moving towards the next joint bay along the route. The construction area moves along in tandem with the progress of the duct installation, with only the relevant portion of the section cordoned off while under construction.

Duct Installation in Roads

The primary difference between construction outside of road areas and those within road areas is that there is very little space for local storage of construction materials including excavated material and new fill material. This necessitates the requirement for designated laydown areas along the road bound cable route.

Excavation within Roads of Width Greater than 3m

For trench excavation works in roads where space is relatively unconstrained, an excavator is typically used to load a truck with excavated material. The truck will then extract the material away from site for appropriate remediation or storage. The excavator and tipper truck would typically sit in parallel to each other and the trench run direction. This allows the excavator to load the truck with minimal bucket swing and the tipper lorry to approach, stop and drive away once full.

For roads with a width greater than 3m, an average rate of construction for the cable route is assumed to be 50m per day. In places it may be slower than this, particularly built up areas where utilities are more common, however, across the period of construction 50m a day is considered a representative average for the proposed works.

Excavation within Roads of Width of 3m or less (Narrow Roads)

Excavation in narrow roads (i.e. widths of 3m or less) introduces a number of challenges compared to the more standard road widths described above.

The excavation process where the excavator and truck sit in parallel is unlikely to be feasible due to available road width. In addition, it may not be practical for a relatively wide truck (approx. 2.6m width) to navigate such roads. If this is the case, then smaller site vehicles will be required to remove the material from the trench area to an area where the material can then be transferred into larger tipper trucks.

For narrow roads, a progress rate for site preparation, excavation, cable installation and reinstatement is estimated at approximately 20m per day.

Underground Cable Laying in Agricultural Lands

Underground cables laid within agricultural lands (grassland and tillage land) require the same essential components, and follow the same construction methodology as for cable laying in public roads – including trenching and ducting, provision of joint bays, and cable installation and jointing.

For off-road or cross-country sections of the Celtic Interconnector, a temporary working strip of minimum 30m in width is proposed. While the cable trench is approximately 1m in width, the 30m working strip is required for the following reasons;

- To facilitate the storage of topsoil which must be removed from;
  - The footprint of the temporary construction access track (typically up to 5m in width)
  - The footprint of the cable trench

  - A buffer strip between the temporary access track and the trench (for safety)
  - Subsoil storage area
  - Materials storage areas
- To facilitate the laying of the temporary construction access track alongside the cable trench to allow for the movement of construction equipment and materials along the section of the route on the farmland.
- To facilitate the excavation of the cable trench and the installation of the cable ducting.
- To facilitate the storage of distinct layers of subsoils excavated from the cable trench in segregated piles for later reinstatement to the original soil profile.

Figure 2.4 shows a typical temporary working strip on agricultural land for electricity cable installation. Stripped topsoil can be seen stored to the left of the strip, temporary construction access road in the centre right with subsoil stripped areas either side for trench installation, materials storage and sub-soil storage.

As noted above, where cables are placed in a public road, the road itself serves to facilitate the movement of vehicles, and the material excavated from the trench is removed off site and so no soil storage areas are required. Similarly, when trenching, ducting and joint bay installation has been completed on a given section of public road, the road can be reinstated for full public use. Cable pulling and jointing works, which may not occur for some period (often many months) afterwards at the joint bays, are serviced with materials and equipment by the public road itself. However, on agricultural land, the temporary access road must remain in place until cable pulling and jointing works have been completed, as it is required to facilitate the movement of materials, equipment and personnel to and from the joint bay locations sited on the land.

For this reason, it is anticipated for the proposed development that any off-road working strip will be unavailable to an affected landowner for a period of up to 18 months - from initial fencing-off to removal of the fence following establishment of grass on the reinstated strip.

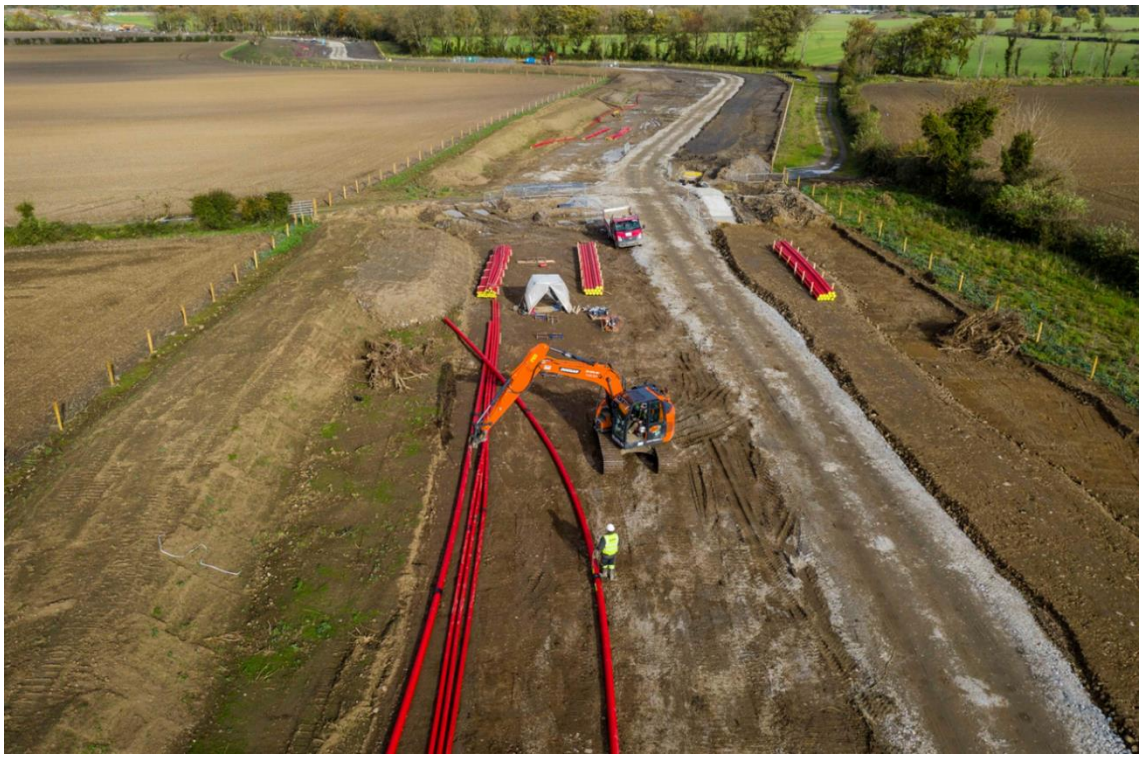
Usually, a cross-country cable alignment seeks to follow field boundaries so as to minimise impact on farm operations. There will however be a requirement to cross a number of fields, ditches, hedgerows, or other features as necessary.

Where HDD (Horizontal Direction Drilling) under an obstacle, such as a watercourse or rail line, is necessary, temporary use of an off-road area (50 x 60m in a worst case scenario), of land at either side of the crossing is required. The area is to establish reception and launch pits for the cable, and to facilitate other works and storage etc.

For minor watercourses, where HDD is not employed, watercourse crossings employ an open trench method, which requires removal of field boundaries in the area of the cable alignment, with associated culverting of drainage ditches etc.

The demarcation of the works area with construction fencing will ensure that no works will occur outside this area. Further detail of HDD and open cut crossings are provided in Section 3.3.8.

Figure 2.4: Typical UGC construction in agricultural lands



Source: EirGrid

Cable Installation

The cables will be brought to site on cable drums which will then be placed into position by tractor and trailer. Once the drum is set up, a winch system including pulling cable will be attached to the nose of the cable and rollers will be used to guide the cable end towards the duct. The cables will then be pulled into the duct with lubrication being applied to the cable and duct throughout the process in order to control pulling tensions.

The main parameter to be evaluated when assessing the cable laying aspects is the cable pulling tension. The techniques to be used depend on the pulling tension required. For example, caterpillars or hauling machines could be used to reduce or null the force applied. It is necessary to synchronise the winch, drum and any intermediary hauling machines to prevent damage to the cable occurring as a result of the imparting of undue force onto the cable during installation.

A bend radius of typically 20m or greater is used to navigate changes in direction for the cable route. The bend radius can be reduced to 6m to navigate very tight corners however as this introduces increased pulling tensions when installing the cable, it is used sparingly and only where required. This applies for both the HVAC and HVDC cable routes.

For tight bends with acute angles, this would require that the excavation and the installation of the ducts and cables being conducted using synchronised cable haulers and split ducts or a similar methodology, rather than pulled through the duct system.

Cable Jointing

As detailed in Section 2.4 *Laying of Underground Cable*, joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling.

The cable jointing process is labour intensive, technically demanding and essential to the effective operation of the cables. For this reason, a temporary waterproof shelter system is either placed or constructed around the joint chamber to provide a clean environment in which the jointing process can be undertaken.

The width of the joint bays and the nature of the road network in the area means that road closures may be required along the route during construction and operation.

Joint bays generally consist of precast concrete walls and base located below ground with (as a worst-case) approximate dimensions of 10m long and 3m wide, with a depth of approximately 2.4m. Sand or lean mix concrete may be used as a blinding layer to the underside of the chamber. The ducts will be installed to each end of the chamber, then proven, cleaned and sealed.

The open concrete chamber will temporarily support the retained ground on the outside of the chamber during the ducting activities. Once these activities are completed, the open chamber will be temporarily backfilled with appropriate material and the road temporarily reinstated to the satisfaction of Cork County Council / TII until such time as cable installation will occur.

During cable installation, the joint bay will be excavated, and material within the chamber removed, some of which may be stored adjacent to the excavation for use in the reinstatement. As illustrated in Figure 2.5, the cables will be pulled into each end of the chamber and the cable ends jointed together within the chamber. Jointing is expected to take approximately one to two weeks per joint bay, during which time a shelter will be erected over the chamber to protect the cable from moisture and contamination during jointing.

Following jointing, the joint bay will be backfilled and the road surface permanently reinstated to the standard required by the relevant authority at that location, i.e. Cork County Council, and for the HVDC cable on national roads, TII, depending on the location.

An example of cable pulling is shown in Figure 2.5. An example of a sheltered joint bay used during jointing is provided in Figure 2.6.

Figure 2.5: Typical Cable pulling at a joint bay

Source: EirGrid

Figure 2.6: Typical HVDC Cable Jointing Bay Shelter

Source: EirGrid

Passing Bays

During the construction phase of the proposed development where a joint bay is located in a road of a width requiring its closure to undertake the cable pulling and jointing, the provision of a passing bay at the location of the joint bay will facilitate the through movement of traffic along the road by means of single traffic signalled lane at the joint bay. Where a passing bay is not provided in these circumstances, a road closure is required to undertake the work.

The installation of the passing bay entails the removal of the top layer of ground to the side of the carriageway and temporarily storing it locally to the side for reinstatement following the works. The passing bay will then be constructed to a standard agreeable to Cork County Council / Transport Infrastructure Ireland (TII).

This passing bay can then be used for diverted traffic whilst the joint bay works are conducted. Figure 2.7 shows a passing bay developed on another EirGrid cable project.

Figure 2.7: Passing Bay

Source: EirGrid

Cable Crossings (Water, Rail and Utility)

A number of crossings will be required along the cable routes. These crossings will be facilitated by either open cut trenching or HDD as and when appropriate.

A description of typical open cut trenching and HDD methods is provided hereunder. Table 3.1 presents the known anticipated crossings along the proposed cable routes. All works will be preceded by detailed utilities / services location assessments, and where existing utilities / services are identified, the works will be diverted around the service / utility or below them depending on the level of complexity arising.

The identification of crossings along the proposed cable routes has been based on consultations with utility providers, site walkovers, field studies and reviews of publicly available datasets such as Environmental Protection Agency (EPA) datasets and mapping. Some smaller features, such as some drainage ditches, may remain unidentified as they do not appear on mapping or databases. However, such features will be identified at construction stage and the mitigation detailed and proposed will be implemented when dealing with any such features.

Table 2.3: Known Anticipated Crossings

Route Section Reference	Crossing Detail	Crossing	Proposed Crossing Method
AC02-AC03	Utility (Eir)	Ducting	Trench
	Watercourse IE_SW_19B060800	Existing Culvert	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
AC03 – AC04	Unnamed drainage ditch	Existing Culvert	Trench
AC04-AC05	Unnamed drainage ditch	Existing Culvert	Trench
AC05-AC06	Utility (Eir- several locations)	Ducting	Trench
	Utility (Irish Water Supply – several locations)	Pressurised pipe	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
AC06-AC07	Railway (Live)	Rail Embankment	HDD
DC01-DC02	Railway (Live)	Rail Embankment	HDD
	Utility (Irish Water Supply – several)	Pressurised pipe	Trench
	Utility (Eir – several)	Ducting	Trench
	Utility (ESB)	Ducting	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
	Owennacurra - IE_SW_190030400	River	HDD
DC02-DC03	Utility (Eir - several)	Ducting	Trench
	Utility (Gas Networks Ireland Transmission)	Gas Transmission Pipeline	HDD
	Utility (Gas Networks Ireland Transmission)	Gas Transmission Pipeline	HDD
	Utility (Irish Water Supply – several locations)	Pressurised pipe	Trench
	Owennacurra - IE_SW_190030500	Twin Culvert	Trench
	Owennacurra - IE_SW_190030500	Existing Culvert	Trench
DC03-DC04	Utility (Eir)	Ducting	Trench
	Owennacurra - IE_SW_190030500	Existing Culvert	Trench
	Greenway Midleton to Youghal (Historic Railway)	Rail Embankment	HDD
	Dungourney - IE_SW_D070700	River	HDD

Route Section Reference	Crossing Detail	Crossing	Proposed Crossing Method
DC04-DC05	Utility (Water supply)	Pressurised pipe	Trench
	Utility (Water foul drainage)	Existing Culvert	Trench
	Utility (Telecoms)	Ducting	Trench
	Unnamed drainage ditch	Culvert	Trench
DC05-DC06	Utility (ESB)	Ducting (for electrified cable)	Trench
	Utility (Water Supply)	Pressurised pipe	Trench
	Utility (Telecoms)	Ducting	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
	Unnamed drainage ditch	Existing Culvert	Trench
DC06-DC07	Utility (Water Supply)	Pressurised pipe	Trench
	Utility (Gas)	Gas Transmission Pipeline	Trench
	Womanagh_010 - IE_SW_19W011000 Unnamed drainage ditch	River	HDD
DC07-DC08	Utility (Telecoms)	Ducting	Trench
	Womanagh_020 - IE_SW_19W011300	Existing Culvert	Trench
	Moanlahan_010 - IE_SW_19M290850	Twin Existing Culverts	Trench
DC08-DC09	Greenway Midleton to Youghal (Historic Railway)	Rail Embankment	HDD
	Dissour_20 - IE_SW_19D030600	River	HDD
	Dissour_20 - IE_SW_19D030600	River	HDD
DC09-DC10	Utility (Water Supply)	Pressurised pipe	Trench
	Utility (Telecoms)	Ducting	Trench
	Utility (ESB)	Ducting (for electrified cable)	Trench
	Dissour_20 - IE_SW_19D030600	River	Trench
	Womanagh_030 - IE_SW_19W011400	River	Trench
	Womanagh_030 - IE_SW_19W011400	River	HDD
	East Ballyvergan_10 - IE_SW_19E040700	River	Trench
	Cattle Underpass (Gortroe Cross)	Existing Culvert	HDD
DC10-DC11	Utility (Water Supply)	Pressurised pipe	Trench
	Utility (Telecoms)	Ducting	Trench
	Utility (ESB)	Ducting (for electrified cable)	Trench
DC11-DC12	Utility (Foul Drainage)	Existing Culvert	Trench
	Utility (Water supply)	Pressurised pipe	Trench

Route Section Reference	Crossing Detail	Crossing	Proposed Crossing Method
	Utility (ESB)	Ducting (for electrified cable)	Trench
	Greenway Midleton to Youghal (Historic Railway)	Rail Embankment Approximately 65m of the HVDC cable will traverse Ballyvergan Marsh pNHA	HDD
	Unnamed drainage ditch	Existing Culvert	Trench

Horizontal Directional Drilling

Horizontal Directional Drilling (HDD) technology has been widely used in the oil and gas industries for several decades. It has become more commonplace in recent times in municipal engineering projects, such as for the installation of electrical cables, optical cables and potable water pipes.

For HDD, the launch and reception pits for the drilling rig (50 x 60m in a worst case scenario), requires the temporary installation of a level hardstanding area on a geotextile base. A pilot hole will be drilled from one side of the crossing to the other side while supporting the bored hole with bentonite. The drill bit will be oriented by the surveyor, and the driller will push the drill string into the ground to maintain the bore path. A steering system, guided by tri-axial magnetometers and accelerometers that provide real time directional information to the surveyor at the driller's console, will be used to navigate the bores.

The drilled cuttings will then be flushed back by the drill fluid flowing via nozzles in the drill bit, up the annulus to the surface, where they will be separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability will be utilised to minimise the volume of fluids required on site. A typical HDD Drilling Rig is shown in Figure 2.8.

Figure 2.8: Typical HDD Drilling Rig

Source: www.vermeersouthafrica.com

2.3.1.3 Vegetation Removal

For narrow roads, the cable systems may need to be installed in the centre or may need to switch from one side of the road to another.

If cables have to be laid in close proximity to trees within approximately 10m) excavation by hand may need to be employed which is typically slower than mechanical excavation techniques.

Section AC04-AC05 (Longstown / Woodstock) of the HVAC cable route is heavily populated by trees and other vegetation. As this section of road is very narrow, regardless of the side of the road excavated, primary and secondary roots will likely be severed.

Section DC03-DC-4 (Killeagh / Harrisgrove) is less populated than section AC04-AC05 however large trees will likely be impacted.

2.3.1.4 Transition Joint Bay

The submarine cables will be jointed with the land cable within underground TJB chambers. The chambers will have approximate plan dimensions of 15m x 4m x 3m deep and will be installed behind the landfall area at Claycastle Beach. Such chambers generally consist of reinforced concrete base slab and walls. The chamber is then typically backfilled with a suitable material (such as cement bound sand) following installation of the cable joints. The top layer can then be backfilled. It is estimated that construction of the transition joint bay chambers will take approximately 18 weeks and will commence at the beginning of Phase 1 of the (submarine cable) landfall activities, as appropriate, having regard to any seasonal constraints that may apply.

The extent of the area required for the joint bay chamber construction works will be minimised as much as possible to limit potential access restrictions for the public to the carpark.

2.3.1.5 Temporary Laydown Areas

All temporary laydown areas will be secured with hoarding / fencing around their perimeter as appropriate. The locations of such laydown areas are indicated in the Planning Drawings.

Where an access road is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed, and the land will be reinstated to its original condition.

All construction workers will be required to use the designated access / egress routes only.

Storage of fuel and refuelling will be undertaken within bunded hardstanding areas. Water will be brought to site via tankers as required.

Security lighting will be directional and cowled, away from vegetated areas and wetlands. The Contractor will regularly review security lighting in this regard, to inform adaptive management if necessary and report the monitoring findings regularly to EirGrid and the local authority.

2.3.1.6 Temporary Construction Compounds

Temporary construction compounds will be required at the connection point (Knockraha substation), the converter station (Ballyadam) and the landfall (Claycastle). The locations of such construction compounds are indicated in the Planning Drawings.

All temporary construction compounds will be secured with hoarding / fencing around the compound perimeters as appropriate. Where temporary construction areas are required and

existing hardstanding is not available, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed and the land will be reinstated to its original condition.

All construction workers will be required to use the designated access / egress routes only.

Temporary facilities will be provided which will include construction phase car parking and welfare facilities and temporary material storage areas as necessary. Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility.

2.3.2 Operational Phase Activities

2.3.2.1 Connection Point

The proposed oil filled transformers at the converter station site and at Knockraha substation will be bunded. The bunds will have the capacity to hold 110% of the volume of oil in each transformer. The maintenance regime will not differ from maintenance regimes to the existing bays at Knockraha substation once the construction phase is complete.

No additional operating requirements will be required from the connection point compared to the existing bays in the substation.

2.3.2.1 HVAC Onshore Circuits

The HVAC and HVDC cables routes will require no specific maintenance requirements along the cable trench or joint bay locations. Access may be required at joint bays on rare occasions to facilitate cable replacement if a failure occurs.

2.3.2.2 Converter Station

The converter station does not require any personnel for operation. Maintenance will be required on an ongoing basis; however, these will be to the installed equipment and will not result in additional impacts to biodiversity.

Lighting will be required at the converter station. Fugitive lighting may spill into the wider landscape creating increased light levels at night.

2.3.3 Decommissioning Phase Activities

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, it is assumed that the equipment will be decommissioned and replaced with new equipment.

The HVAC and HVDC cables will either be left in place or will be removed for recycling in accordance with the relevant waste management regulations in place when decommissioning takes place. All equipment for the converter station will be removed for recycling or disposal as required by the regulations are the time.

The activities associated with the decommissioning phase will be similar to those associated with the construction phase.

2.3.4 Summary of potential for impacts.

In the absence of mitigation measures, there is the potential for the following impacts.

Construction Phase:

- Potential for direct impact to habitats and species within the footprint of the Proposed Development.
- Potential for indirect impact to habitats and species within the vicinity / downstream of the Proposed Development.
- Potential for generation of dust
- Potential for generation of surface-water pollution/sedimentation.
- Potential for noise and vibration effects.

Operational Phase:

- Potential for a local increase in light levels anticipated.

Decommissioning phase:

- As per construction phase.

2.4 European sites in the Zone of Influence

2.4.1 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2018) states that:

"*The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries*" and that "*the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change*."

The ZoI varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

The ZoI identified for various ecological receptors, having regard to the potential for impact as outlined previously are as detailed below:

- 100m either side of the cable route midline for breeding passerines (Whitfield *et al.* 2008)
- 200m either side of the cable route midline for terrestrial habitats as this is the likely zone for physical and dust effects associated with the works (NRA 2011).
- 400m for disturbance effects to wetland bird species (based on noise levels at Claycastle taken as the worst-case scenario for construction phase for the development based on worst-case predictive noise modelling for piling associated with the Proposed Development (details provided later in Section 3.3.1.2). Note this corresponds to sections 3 and 4 of the wintering bird survey area.
- 150m for terrestrial mammals (NRA 2006)
- Up to 1000 m for non-breeding hen harrier *Circus cyaneus*[6]

[6] Little information is available in relation to disturbance responses in wintering hen harrier. In breeding hen harrier, a safe working distance buffer of between 500m and 1000m is recommended (Petty 1998, Romin & Muck 1999; Currie & Elliot 1997, Whitfield et al.,

- Catchment wide ZoI for surface waterbodies
- 500m for drilling activities and 1km for piling activities for noise impacts to marine mammals (DAHG 2014)

2.4.2 Source-Pathway-Receptor and Impact Assessment

Projects have the potential to impact on European sites beyond the footprint of the project itself. National Guidance[7] states that screening for AA should be carried out for any European site within the likely 'Zone of Influence' of a plan or project. For projects, the guidance recommends that the Zone of Influence (ZoI) must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

In order to establish the ZoI of the Proposed Development, desktop and field survey data on protected habitats and species was mapped using a Geographic Information System (GIS). This data was interrogated for source-pathway-receptor connectivity.

The source (potential impacts from the Proposed Development), pathways (hydrological, physical or ecological connectivity) and receptors (QIs and SCIs of the European sites) were identified through a combination of bespoke field survey, and desktop survey including use of GIS software. and through examination of aerial photography. Any European sites identified to have a viable source-pathway-receptor link to the Proposed Development were then examined further to determine the potential for significant effects.

The potential environmental effects of the Proposed Development can be summarised as:

- Dust deposition;
- Noise and vibration;
- Lighting (temporary and permanent);
- Accidental release of pollutants into surface waters, and underground conduits;
- Introduction, dispersal or spread of invasive species; and,
- Sedimentation of surface waters from site runoff and dewatering of excavations.

All works associated with the Proposed Development tare located wholly outside of the boundaries of any European sites. The location of the red line boundary for the Proposed Development in relation to European sites is provided in Appendix C.

Table 2.4 includes the source-pathway-receptor assessment for the Proposed Development.

All European sites within the Natura 2000 network were considered in the course of compiling Table 2.4, in addition to UK sites, which formerly did, but no longer do form part of the network (See Section 1.4.1).

2008). As such, having regard to the precautionary principle, the buffer for disturbance to wintering hen harrier specifically when they arrive into roost areas is taken as 1000m.

[7] Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government, 2009

Table 2.4: Source-Pathway-receptor Assessment and Assessment of Potential for Significant Effects

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Special Area of Conservation (SAC)				
Great Island Channel SAC (001058) (NPWS 2014a)	1.7km	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Downstream hydrological connectivity has been identified via the following watercourses: • Tibbotstown_010 • Owennacurra_030 • Owennacurra_040 • Dungourney_020 The potential for ground water connectivity via underground karst systems within the Converter Station site has been identified. Given the proximity of the Converter Station site to the SAC, these underground systems have the potential to act as conduits for surface water and ground water pollutants. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Great Island SAC, a pathway for surface water pollutants to enter into the European site has been identified. Surface water pollutants have the potential to result in degradation of habitats associated with Great Island SAC. On this basis, the potential for significant effects to Great Island Channel SAC is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Ballymacoda (Clonpriest and Pillmore) SAC (000077) (NPWS 2015a)	2.8km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Downstream hydrological connectivity has been identified via the following watercourses: • Womanagh_010" • Womanagh_020 • Moanlahan_010 • Dissour_020 • Womanagh_030 • East Ballyvergan_010 On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Ballymacoda (Clonpriest and Pillmore) SAC a pathway for surface water pollutants to enter into the European site has been identified. Surface water pollutants have the potential to result in degradation of habitats associated with the SAC. On this basis, the potential for significant effects to Ballymacoda (Clonpriest and Pillmore) SAC is identified.
Blackwater River (Cork/Waterford) SAC (002170) (NPWS 2012b)	1.4km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. Given that any pollutants associated with the Proposed Development would likely be dissipated significantly prior to entering into the European site boundary due to the pathway via freshwater, coastal water and transitional water. A number of Qualifying Interests species associated with the European site may also occur outside of the European site boundary in proximity to the works areas. On this basis a viable source-pathway-receptor link is identified in terms of both surface water pollution, and noise and vibration effects.	Given the nature of the QIs associated with the Blackwater River SAC the potential for effects to Blackwater River (Cork/Waterford) SAC has been identified through degradation of coastal water quality, and disturbance effects through noise and vibration. On this basis, the potential for significant effects to Blackwater River (Cork/Waterford) SAC is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* *Margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096]		

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Lampetra fluviatilis (River Lamprey) [1099] *Alosa fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra* (Otter) [1355] *Trichomanes speciosum* (Killarney Fern) [1421]		
Lower River Shannon SAC (002165) (NPWS 2012a)	78km	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	The Lower River Shannon SAC is located a significant distance from the works. Based on the distance, with the exception of bottlenose dolphin, none of the QIs associated with this site have potential to occur within the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that these are shallow coastal waters, predominantly containing beach habitats the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa and Fraxinus* excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera* (Freshwater Pearl Mussel) [1029]		

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Petromyzon marinus (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Lutra* (Otter) [1355]		
Saltee Islands SAC (000707) (NPWS 2011a)	81km	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Submerged or partially submerged sea caves [8330] *Halichoerus grypus* (Grey Seal) [1364]	The Saltee Islands SAC is located a significant distance from the works. Based on the distance, with the exception of grey seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Roaring water Bay and Islands SAC (000101) (NPWS 2011b)	86km	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] *Phocoena* (Harbour Porpoise) [1351] *Lutra* (Otter) [1355] *Halichoerus grypus* (Grey Seal) [1364]	The Roaring water Bay and Islands SAC is located a significant distance from the works. Based on the distance, with the exception of grey seals, and harbour porpoise, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, and that records for harbour porpoise in the area are related to strandings, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.
Slaney River Valley SAC (000781) (NPWS 2011c)	101km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410]	The Slaney River Valley SAC is located a significant distance from the works. Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling required for the Proposed Development is located within Ballyvergan Marsh for proposed HDD works. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Alosa fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106]	area has not been identified as a regular haul out location for seals, the source pathway receptor link is not deemed to be viable.	

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Lutra (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365]		
Blasket Islands SAC (002172) (NPWS 2014b)	147km	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoerus grypus* (Grey Seal) [1364]	The Blasket Islands SAC is located a significant distance from the works (>220km via coast). Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, and that records for harbour porpoise in the area are related to stranding, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.
West Connacht Coast SAC (002998) (NPWS 2015b)	212km	Tursiops truncatus (*Common Bottlenose Dolphin*) [1349]	The Blasket Islands SAC is located a significant distance from the works (>220km via coast). Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by DAHG (2014) for drilling works is 500m. The nearest extent of drilling	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that these are shallow coastal waters, predominantly containing beach habitats, and history records relate to strandings, the source pathway receptor link is not deemed to be viable.	
Special Protection Area (SPA)				
Cork Harbour SPA (004030) (NPWS 2014c)	1.9km	<u>Non-breeding: populations:</u> Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Shelduck (*Tadorna tadorna*) [A048]	Downstream hydrological connectivity to Cork Harbour SPA has been identified via the following watercourses: • Tibbotstown_010 • Owennacurra_030 • Owennacurra_040 • Dungourney_020 The potential for underground karst systems within the Converter Station site has been identified. These underground systems have the potential to act as conduits for surface water pollutants. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Cork Harbour SPA a pathway for surface water pollutants to enter into the European site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. There is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works. On this basis, the potential for significant effects to Cork Harbour SPA is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157]	There is potential for SCIs associated with the SPA to occur outside of the site boundaries and in proximity to the works areas. As such, a second viable source-pathway-receptor link is identified.	

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Greenshank (*Tringa nebularia*) [A164] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] <u>Breeding Populations</u> *Podiceps cristatus*) [A005] Common Tern (*Sterna hirundo*) [A193] – <u>Other</u>: Wetland and Waterbirds [A999]		

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Ballymacoda Bay SPA (004023) (NPWS 2015c)	1.4km	<u>All non-breeding populations:</u> Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162]	Downstream hydrological connectivity has been identified via the following watercourses: • Womanagh_010" • Womanagh_020 • Moanlahan_010 • Dissour_020 • Womanagh_030 • East Ballyvergan_010 On this basis, a viable source pathway receptor link is identified in terms of surface water pollution. There is potential for SCIs associated with the SPA to occur outside of the site boundary and in proximity to the works area. As such, a viable source-pathway-receptor link is identified in terms of direct impact and noise and vibration effects.	Given the multiple hydrological routes identified with connectivity to Ballymacoda Bay SPA a pathway for surface water pollutants to enter into the European site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. Further, where QIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works. On this basis, the potential for significant effects to Ballymacoda Bay SPA is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] <u>Other</u> Wetland and Waterbirds [A999]		
Blackwater Estuary SPA (004028) (NPWS 2012b)	2.4km	<u>All Non-breeding populations</u> Wigeon (*Anas penelope*) [A050] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156]	Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. Given that any surface water run-off associated with the Proposed Development would likely be dissipated significantly prior to entering into the European site boundary due to the pathway via freshwater, coastal water and transitional water. Despite this, there is potential for SCIs to occur outside of the European site boundary. As such, a viable source pathway receptor link has been identified in terms of direct impact to species, and noise and vibration effects.	Given the multiple hydrological routes identified with connectivity to Ballymacoda Bay SPA a pathway for surface water pollutants to enter into the European site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. Further, where SCIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] <u>Other</u> Wetland and Waterbirds [A999]		On this basis, the potential for significant effects to Cork Harbour SPA is identified.
Mullaghanish to Musheramore Mountains SPA (004162) (2020)	45km	Hen Harrier (*Circus cyaneus*) [A082] - Breeding	It is noted that there is a considerable distance between the closest breeding hen harrier SPA - Mullaghanish to Musheramore Mountains SPA and the works areas. However, it has been established that hen harrier migrate outside of breeding grounds to lowland winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990, O'Donoghue 2019, O'Donoghue 2021). Wintering hen harrier roosts are well known to occur in the Ballyvergan Marsh area. As such, there is potential for wintering hen harrier to roost in proximity to works areas. As such, a viable source pathway receptor link has been identified in terms of direct impact to supporting habitat, and through disturbance caused by noise and vibration.	Viable source-pathway-receptor links have been identified for direct impact, and noise and vibration effects to wintering hen harrier in the vicinity of the works. On this basis the potential for significant effects to Mullaghanish to Musheramore Mountains SPA has been identified.

2.5 Plans and Projects Which Might Act in Combination

Article 6(3) of the Habitats Directive requires that:

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.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects. A search of planning applications[8] in the vicinity of the works was undertaken in December 2020 to examine projects with potential for in combination effects. Applications which were made typically consisted of extensions, demolitions and renovations to existing houses and agricultural buildings, and retention of existing developments.

Given the location of these works in relation to the European sites, and the Proposed Development there is no potential for in-combination effects.

Other, larger scale, projects which were identified are outlined hereunder:

Celtic Interconnector Project below High-Water Mark

As previously noted, this AA Screening assesses the effects on European sites of the (Irish land-based elements of the) Proposed Development (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Project elements in the UK Exclusive Economic Zone, and French elements of the Project.

A separate AA Screening and NIS has been drafted for the (Irish) Offshore elements of the works ('the Irish offshore NIS'). The AA Screening for the Irish offshore could not exclude the potential for likely significant effects on the Ballymacoda Bay SPA and the Blackwater Estuary SPA.

In the absence of mitigation, and/or should works associated with the cable route up to the high water mark take place concurrently to the works at the landfall location (i.e. the worst-case scenario), there is potential for an in-combination effect on the Ballymacoda Bay SPA and the Blackwater Estuary SPA arising from bird disturbance associated with increased noise emissions, and visible human presence.

A Habitats Regulations Assessment (HRA) Screening assessment was produced for the UK (offshore) elements of the Project. This concluded that the potential for significant effects on the conservation objectives on European sites could be excluded for the UK part of the Project, in-combination with other plans and projects, including the overall Project.

For the French elements of the Project, reporting to fulfil Article 6(3) of the Habitats Directive comprises a report (in French) entitled: 'Évaluation Des Incidences Natura 2000. This report did not identify potential for likely significant effects on any European sites within the Irish jurisdiction, and concluded there would be no adverse effects on the integrity of any European sites, from the project alone, and in combination with other plans or projects.

[8] Planning Websites: Cork County Council, Waterford County Council and An Bord Pleanála.

Midleton to Youghal Greenway

The project comprises a greenway route which runs from the north-eastern corner of Midleton to the old railway station at Youghal in east Cork. As part of the application an Appropriate Assessment Screening report was prepared.

Construction works for the greenway are currently progressing and will be completed in advance of the construction phase of the Proposed Development.

There is potential for surface water run-off associated with the Midleton to Youghal greenway works. However, the timing of the works is such that the greenway will be constructed prior to the commencement of the construction phase of this Proposed Development. No potential for likely significant in-combination effects has been identified.

Midleton Carrigtwohill WWTP upgrades

Irish Water have identified plans to upgrade the capacity of the sewage treatment system in the greater Midleton area. Site Investigation (SI) works are required to inform the design of the treatment plant. These SI works are anticipated to commence in Q1 2021. As such they will be taking place prior to works for Celtic Interconnector. The SI works are of short duration, and small scale in nature. Further the SI works do not overlap with the boundaries of any European sites. Irish Water has published an AA Screening Determination (Irish Water, 2021), concluding that likely significant effects from the SI works on European sites can be excluded on the basis of objective evidence. As such no potential for likely significant in-combination effects has been identified.

Following the design of the proposed upgrades, the upgrades of the Midleton and Carrigtwohill WWTP will be subject itself to the provisions of Article 6(3), i.e. requiring screening for Appropriate Assessment as a minimum, and AA, if necessary. It is likely the upgrades will require AA, given mitigation measures to protect European sites such as pollution control measures during construction are likely requirements. However, given the WwTP does not overlap European sites, and that mitigation will be employed, significant in-combination effects are not predicted.

Urban Expansion Project

The urban expansion of the area to the northwest of the Converter Station site is planned to facilitate housing development. As well as residential development, the proposals will include cycling/pedestrian facilities, a new school campus and road upgrades.

Following the design of the proposed expansion project, it will be subject to the provisions of Article 6(3), i.e. requiring screening for Appropriate Assessment as a minimum, and AA, if necessary. It is possible the project will require AA, given mitigation measures to protect European sites such as pollution control measures during construction may be required. However, given the proposals do not overlap European sites, and that mitigation will be employed, significant in-combination effects are not predicted.

Cork County Development Plan

The Proposed Development is located within the Cork County administrative area. The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by an Appropriate Assessment which was undertaken to ensure that any likely effects of the plans' policies were considered in order to avoid any such adverse impacts.

The Natura Impact Report outlines European sites which were subject to review, screening conclusions and key planning requirements to protect/restore site integrity. A summary of this

assessment are provided Table 2.5 in relation to European sites identified as within the ZoI for the Proposed Development.

Table 2.5: County Development Plan Screening Conclusions

European site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
Great Island Channel SAC	Potential for impacts identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones within Cork Harbour; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Protect estuarine habitats from risk of toxic contamination arising from industrial and port related activities common in the harbour area.
Ballymacoda (Clonpriest and Pillmore) SAC	Not identified as having potential to be impacted by the CDP. The site was screened out at the draft development plan stage	• Maintain or restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area • Prevent direct loss of estuarine habitats within the SAC • Prevent drainage of wetland habitats • Prevent contamination or deterioration of estuarine habitats
Blackwater River (Cork/Waterford) SAC	Potential for significant impacts to arise relating in particular to Core Strategy, Wind Energy Strategy, and provision of roads infrastructure.	• Restore a high standard of water of water quality in surface waters in SAC; • Maintain open channels to allow the free passage of fish in freshwater habitats; • Maintain stable hydrological regime in surface waters in SAC; • Prevent direct loss of freshwater habitats within SAC; • Prevent drainage of wetland habitats; • Prevent contamination or other deterioration of freshwater habitats in SAC; • Prevent disturbance to otter and otter habitat.
Cork Harbour SPA	Potential for impacts Identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Prevent disturbance to wintering birds; • Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats;
Ballymacoda Bay SPA	Not identified as having potential to be impacted by the CDP.	
Blackwater Estuary SPA	Potential impacts identified relating to inadequate treatment of wastewater and tourism policies.	

European site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
		• Prevent contamination or deterioration of estuarine habitats.
Mullaghanish to Musheramore Mountains SPA	No potential impacts specified but amendments recommended to draft plan re wind energy policy and provision of wastewater infrastructure	• Prevent disturbance to breeding birds; • Protect feeding and breeding habitat of hen harrier

Concluding Remarks

An NIS has been prepared for the offshore Irish elements of the Project, for which likely significant effects could not be excluded in the absence of mitigation (Ballymacoda Bay SPA, and Blackwater Estuary SPA). This is addressed in detail in the NIS for the Proposed Development in Section 3.3.5.

For all other projects, adherence to the Council's policies and objectives, combined with existing legal requirements will ensure that all plans and projects proposed within the county are subjected to Article 6(3) requirements. As such, and given the locations of the projects identified, no significant in-combination effects are identified with the Proposed Development.

2.6 Summary of Potentially Significant Effects

In the absence of mitigation, potential for likely significant effects on European sites have been identified from the Proposed Development alone. In the absence of mitigation (at AA Screening Stage), potentially significant in-combination effects were additionally identified with the offshore Irish elements of the Project: from ex-situ noise and visible disturbance effects to birds associated with the Ballymacoda Bay SPA and Blackwater Estuary SPA.

No other potentially significant in combination effects have been identified with other plans and projects. The following European sites have been identified as at risk of likely significant effects

- Great Island Channel SAC
- Ballymacoda (Clonpriest and Pillmore) SAC
- Blackwater River (Cork/Waterford) SAC
- Cork Harbour SPA
- Ballymacoda Bay SPA
- Blackwater Estuary SPA
- Mullaghanish to Musheramore Mountains SPA

Based on scientific analyses of best available scientific information, no other European sites in the UK or other jurisdictions are relevant to the Screening assessment and NIS.

2.7 Screening Outcome

The current assessment investigates the potential for the Proposed Development to have likely significant effects on European sites within the Natura 2000 network (and UK European sites), in combination with other plans or projects.

This AA Screening report concludes that likely significant effects on European sites cannot be excluded on the basis of objective evidence, from the Proposed Development alone, and in combination with other plans or projects.

3 Natura Impact Statement

This Natura Impact Statement (NIS) has been produced in support of the Appropriate Assessment of the Proposed Development to be undertaken by the competent authority. The NIS considers whether the elements of the Proposed Development with potential for likely significant effects will adversely affect the integrity of European sites with respect to each site's conservation objectives. Mitigation measures are identified to avoid adverse effects on the integrity of European sites.

3.1 Description of the Development

The development is described in detail in Section 2.1 of this report as follows;

- Construction phase activities are outlined in Section 2.3
- Operational phase activities are outlined in Section 2.3.2
- Decommissioning phase activities are outlined in Section 2.3.3

3.2 Description of the Receiving Environment

3.2.1 Habitats Within the Footprint of the Proposed Development

The habitat types associated with the footprint of the Proposed Development are described in Section 2.2. As has already been confirmed, none of the site overlaps or adjoins European sites. The majority of the cable route lies within existing roadways and improved agricultural grassland. There are several localized areas of Priority and non-priority Annex 1 habitat types within and adjacent the Proposed Development site, but these are outside European sites.

At the time of writing, an amount of vegetation along section DC03-DC04 (Ballyrichard Beg) had recently been cleared.

3.2.1.1 Watercourses.

Table 3.1 presents an overview of WFD surface waterbodies within or in close proximity to the Proposed Development, as detailed on EPA datasets and mapping, and ground-truthed by field surveys. The following detail is provided:

- WFD surface waterbody water crossings (denoted as 0m distance) and WFD surface waterbodies within 500 metres of the Proposed Development (closest distance provided);
- River waterbody WFD status 2013-2018;
- EPA name for surface waterbody; and,
- Summary of aquatic ecology evaluation.

Table 3.1 describes, for each watercourse, potential connectivity with European sites downstream (as there are no European sites upstream of any watercourses).

Table 3.1: Receiving Environment

Route Section Name [9]	WFD Waterbodies (WFD Status 2013-2018) and proximity to Proposed Development	Name (EPA)	Summary of Aquatic Assessment Survey Findings (Triturus 2020)[10] *[Note: none of the Atlantic salmon or lamprey populations described are within the catchment of SAC populations]*	Connectivity with European sites
Connection Point	None. The closest known waterbody to the proposed works at Knockraha substation is Lisheenroe Stream, a tributary of the Butlerstown River, located approximately 650m east of the proposed construction compound	Not Applicable	Not applicable	No watercourses identified. No connectivity with European sites identified
AC01-AC02	None identified	Not applicable	Not applicable	No watercourses identified. No connectivity with European sites identified
AC02-AC03	BUTLERSTOWN_030 (Good) - 0m distance Unnamed drainage ditch - - 0m distance	Lisheenroe (EPA code: 19L40)	Suitable habitat for salmonids	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
AC03-AC04	OWENNACURRA_030 (Good) ca. 370m Tibbotstown_010 (Unassigned)- ca 45m Unnamed drainage ditch - 0m distance	Tibbotstown (EPA code: 19T25)	Owennacurra: Suitable habitat for salmonids present, record of lamprey, Tibbotstown: Semi dry, lack of suitable fisheries habitat Unnamed drainage ditch:	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
AC04-AC05	Unnamed drainage ditch 0m distance	Not Applicable	Not surveyed	None mapped, assumed ultimately downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.

[9] Section labels are indicated in mapping provided in Appendix B

[10] Trituris (2020). Aquatic baseline report for the Celtic Interconnector onshore cable route alignment, Co. Cork

Route Section Name [9]	WFD Waterbodies (WFD Status 2013-2018) and proximity to Proposed Development	Name (EPA)	Summary of Aquatic Assessment Survey Findings (Triturus 2020)[10] *[Note: none of the Atlantic salmon or lamprey populations described are within the catchment of SAC populations]*	Connectivity with European sites
AC05-AC06	Unnamed drainage ditch x 2 0m distance	Not Applicable	Not surveyed	None mapped, assumed ultimately downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
Converter Station	Two existing depressions within the Converter Station compound footprint currently collect rainwater Two infilled unnamed lakes ca.50 metres from the proposed access routes	Not Applicable	Not surveyed, note no connectivity to river waterbodies	Potential for underground conduits to be connected to Great Island Channel SAC, and Cork Harbour SPA.
DC01-DC02	OWENNACURRA_030 (Good) 0m distance OWENNACURRA_040 (Moderate) ca. 25m distance Unnamed drainage ditch x 3 0m distance	Owennacurra (EPA code: 19O03) / 19O03	Owenacurra River: Suitable habitat for salmonids. Lamprey, and otter present Unnamed drainage ditch: Not surveyed	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
DC02-DC03	Two river crossings (OWENNACURRA_040) (Moderate) 0m distance	Glenathonacash (EPA code: 19G66), Elfordstown (EPA CODE: 19E02)	Owennacurra: Suitable habitat for salmonids. lamprey. Otter known to be present. Glenathonocash River: Salmonids, lamprey, & otter present Elfordstown River: Salmonids present; lamprey habitat present	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
DC03-DC04	Two river crossings. OWENNACURRA_040 (Moderate) and DUNGOURNEY_020 (Poor) 0m distance	Dungourney 19 (EPA CODE: 19D07). Elfordstown (EPA CODE: 19E02)	Owennacurra: Suitable habitat for salmonids, and lamprey. Otter known to be present. Dungourney: Suitable habitat for salmonids, and lamprey	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.

Route Section Name [9]	WFD Waterbodies (WFD Status 2013-2018) and proximity to Proposed Development	Name (EPA)	Summary of Aquatic Assessment Survey Findings (Triturus 2020)[10] *[Note: none of the Atlantic salmon or lamprey populations described are within the catchment of SAC populations]*	Connectivity with European sites
DC04-DC05	DUNGOURNEY_020 (Poor) ca. 30m distance Unnamed drainage ditch	Harrisgrove (EPA code: 19H02)	Low fisheries value.	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
DC05-DC06	Loughs Aderry and Ballybutler pNHA pNHA boundary within N25. Lough Aderry ca. 15m distance DUNGOURNEY_020 (Poor) ca. 100m distance Unnamed drainage ditch x 2. 0m distance	Harrisgrove (EPA code: 19H02) Loughs Aderry (EPA code: 19_65)	Harrisgrove: Low fisheries value Loughs Aderry: Low fisheries value Unnamed drainage ditch not surveyed	Downstream connectivity to Great Island Channel SAC, and Cork Harbour SPA.
DC06-DC07	WOMANAGH_010 (Moderate) 0m distance Clasharinka Pond pNHA boundary within N25 WOMANAGH_020 (Good) ca 105m distance Unnamed drainage ditch 0m distance	Womanagh (EPA code: 19W01)	Womanagh River: Salmonids present; lamprey, & otter habitat present. Clasharinka Pond: not surveyed Unnamed Drainage ditch: Not surveyed	Connectivity routes unclear based on mapping, assumed downstream connectivity to Ballymacoda (Clonpriest and Pilmore) SAC, Ballymacoda Bay SPA, Great Island Channel SAC, and Cork Harbour SPA.
DC07-DC08	Two Crossings. WOMANAGH_020 (Good) MOANLAHAN_010 (Unassigned) 0m distance Clasharinka Pond pNHA boundary within N25	Annistown (EPA code: 19A24) Moanlahan (EPA code: 19M29)	Annistown Stream: Stream 100% dry at time of survey Moanlahan River: Low fisheries value Clasharinka Pond: not surveyed	Connectivity routes unclear based on mapping, assumed downstream connectivity to Ballymacoda (Clonpriest and Pilmore) SAC, Ballymacoda Bay SPA, Great Island Channel SAC, and Cork Harbour SPA.
DC08-DC09	Two river crossings for each DISSOUR_020 (Good) 0m distance	Dissour (EPA code: 19D03) / Inchanapisha (EPA code: 19I19)	Dissour River: Salmonids present; lamprey, and otter habitat present Inchanapisha River: Good salmonid nursery habitat	Downstream connectivity to Ballymacoda (Clonpriest and Pilmore) SAC, and Ballymacoda Bay SPA

Route Section Name [9]	WFD Waterbodies (WFD Status 2013-2018) and proximity to Proposed Development	Name (EPA)	Summary of Aquatic Assessment Survey Findings (Triturus 2020)[10] *[Note: none of the Atlantic salmon or lamprey populations described are within the catchment of SAC populations]*	Connectivity with European sites
DC09-DC010	Four Crossings. DISSOUR_020 (Good). WOMANAGH_030 (Unassigned x 2). East Ballyvergan_010 (Unassigned) 0m distance Ballyvergan Marsh pNHA (000078) boundary along R634 0m distance	Lagile (EPA Code: 19l47) Gortnagark (EPA Code: 19g72) Inchiquin (EPA Code: 19i14) East Ballyvergan (EPA Code: 19e04)	Salmonids present; lamprey, eel & otter habitat present (Inchiquin stream) Lagile Stream and Gortnagark Stream: No findings relevant to QI species Inchiquin Stream: Salmonids present; lamprey, and otter habitat present East Ballyvergan Stream: Low fisheries value	Downstream connectivity to Ballymacoda (Clonpriest and Pilmore) SAC, and Ballymacoda Bay SPA
DC10-DC011	East Ballyvergan_010 (Unassigned) ca. 180m distance Ballyvergan Marsh pNHA (000078) boundary along R634 0m distance Ballvergan Marsh Bird Pond ca. 145m distance	Pipersbog (EPA code: 19P09)	Not surveyed	No direct connectivity identified
DC11-DC012	Unnamed drainage ditch 0m distance Ballyvergan Marsh pNHA (000078) 0m distance	Not Applicable	Not surveyed	No direct connectivity identified.
Landfall	Youghal Bay (Moderate) Excellent Bathing Water Quality 0m distance Large unnamed (saline) drain within Ballyvergan Marsh pNHA (000078) to west of car park ca. 190 metres	Youghal Bay	Coastal waters – not surveyed as part of aquatic survey for proposed development	Connectivity through coastal waters to Blackwater River (Cork/Waterford) SAC

3.2.2 Invasive Species

The following Third Schedule invasive species were recorded:

- Japanese knotweed (*Fallopia japonica*) (Figure 3.1: Japanese Knotweed along Dissour River)
- Himalayan balsam (*Impatiens glandulifera*) (Figure 3.2)
- Sea buckthorn (*Hippophae rhamnoides)* (Figure 3.3)
- American mink (*Neovison vison*) (Figure 3.4)
- Three cornered leek (*Allium triquetrum*) (Figure 3.5)
- Spanish bluebell (*Hyacinthoides hispanica*) (Figure 8.46)

Figure 3.1: Japanese Knotweed along Dissour River

Source: Mott MacDonald September 2020

Figure 3.2: Himalayan Balsam Plants Along Owennacurra River

Source: Mott MacDonald October 2020

Figure 3.3: Sea Buckthorn at Claycastle

Source: Mott MacDonald October 2020

Figure 3.4: Mink Recorded Close to Owenacurra River

Source: Mott MacDonald November 2020

Figure 3.5: Three Cornered Leek Along Cable Route

Figure 3.6: Spanish Bluebell at Claycastle

The locations of these species relative to the Proposed Development are outline in Table 3.2 hereunder.

Table 3.2: Locations of Invasive Species Stands

Location	Invasive Species Recorded	Notes
Knockraha Substation	None	None
AC01-AC02	None	None
AC02-AC03	None	None
AC03-AC04	None	None
AC04-AC05	None	None
AC05-AC06	Japanese knotweed	• Single roadside stand. Potentially affected by cable
Converter Station Site	None	None
DC01-DC02	Himalayan balsam	• Numerous plants growing along the riverbank both upstream and downstream of the Owennacurra river crossing. Potentially will be affected by cable.
DC02-DC03	Japanese knotweed	Extensive stand of knotweed located on roadside. Appears to be under treatment by the council. Outside of works area. • American mink recorded during trail camera survey
DC03-DC04	Three cornered leek	• In riparian zone along the Dungourney River • Numerous stands along cable route in roadside verges
DC04-DC05	Three cornered leek	Multiple stands along cable route in roadside verges
DC05-DC06	None	None
DC06-DC07B	None	None
DC07-DC08	Three cornered leek	In riparian zone along the Dissour river

Location	Invasive Species Recorded	Notes
DC08-DC09B	Japanese knotweed	• Multiple significant untreated stands of knotweed along the banks of the river Dissour and along field boundaries. Does not appear to be under treatment. Potentially affected by cable.
DC09-DC10	None	None
DC11-DC12	Japanese knotweed	• Stand within an area of scrub in Ballyvergan Marsh. Appears to be undergoing treatment, 'bonsai' growth evident (indicating herbicide treatment in previous season(s)). Outside of works area.
DC12 - HWM	Sea buckthorn Spanish bluebell	• Single stand of sea buckthorn within a planted border within the redline boundary. • Two Spanish bluebell records in proximity to the temporary compound, one further to the west outside of the works area.

While American mink is listed as an invasive species, there is no potential for the works to result in the spread of the species. It is therefore, not considered further in the context of this document.

The Spanish bluebell was recorded within and close to the works area at Claycastle. Given the location of the records, there is no potential for spread to any European sites.

With the exception of the banks of the river Disour, and the river Dungourney, three cornered leek was recorded along roadside verges. Three cornered leek is not known to spread via hydrochory. As such, given the location of the stands, there is no potential for the works to result in the spread of the species into any European sites.

The locations of these stands are presented in Appendix B.

3.2.3 Wintering Birds

An assessment of the potential for the Proposed Development to support *ex situ* SCI species is provided hereunder. The assessment includes data from NPWS in relation to Loughs Aderry and Ballybutler pNHA which are known areas where SCI wintering birds potentially occur. Also considered are survey results from specific wintering bird surveys carried out in 2019, 2020 and 2021 along the proposed development including at Ballyvergan Marsh and surroundings and Claycastle beach and coastal areas close to here (within 2km).

3.2.3.1 Loughs Aderry and Ballybutler pNHA

The site synopsis for the Lough Aderry and Ballybutler pNHA (NPWS 1997) notes that the site supports nationally important numbers of gadwell along with a variety of waterfowl including mute swan, wigeon, teal, mallard, shoveler, pochard (*Aythya farina*), coot (*Fulica atra*) and lapwing (*Vanellus vanellus*). The proposed cable route runs along the northern section of the site at DC05 to DC06. Associations of these species to nearby SPAs is outlined below in Table 3.3.

Table 3.3: Bird Species associated with Lough Aderry and Ballybutler pNHA

Species	Conservation Status (Gilbert et al., 2021)	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA
Gadwell	Amber	-	-	-
Lapwing	Red	✓	✓	✓
Mallard	Amber	-	-	-
Mute swan	Amber	-	-	-
Pochard	Red	-	-	-
Teal	Amber	✓	-	✓
Wigeon	Amber	✓	✓	✓

It is of note that the northern boundary of the pNHA adjoins the existing N25 roadway,and Proposed Development boundary. This is a busy road that links Castlemartyr and Midleton towns. As such, the northern boundary and nearby areas of the site are subject to significant noise disturbance throughout the year. However, while birds are likely to habituate to regular on-going noise disturbance, impulsive noise sources as might be produced during construction phase works have the potential to cause localised temporary disturbance.

3.2.3.2 Field Survey Results Wintering Waterfowl

Low and High Tide Survey

The counts across all three survey seasons (early winter 2019, winter 2019/2020, and winter 2020/2021) from surveys (at either high or low water) at the Claycastle/Redbarn area are summarised below in Table 3.4.

The table provides the peak numbers of each species and with estimates of the all-Ireland wintering populations of each species, along with the figure where the numbers would qualify as being of national significance. The colour rating refers to 'Birds of Conservation Concern in Ireland' [11]), where species are included in either red or amber lists to highlight concern about their populations. Peak counts of note are highlighted in bold. It should be noted that a peak count of a bird population meeting the nationally significant figure, does not indicate the survey

[11] Gilbert, G., Stanbury, A., Lewis, L. 2021 Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22

area is as important for a species as an SPA designated for it. The reason for this is statistical. Figures of national significance are calculated from the peak figures averaged over a five- year period.

The table shows that 17 SCI species were recorded. Notable counts of SCI species recorded during the survey are discussed further below.

At low water, sanderling was the species recorded in the highest numbers. This small wading bird is a highly mobile species that is seen scurrying along the edge of the waterline picking at debris washed up the constantly moving drift line. Although count section one held the highest numbers of sanderling, this species is likely to move constantly along the beach in search of food. This is reflected in both the 2019/2020 and the 2020/2021 bird survey results which recorded sanderling (albeit in lower numbers) within sections three and four. The beach below the high-water level is relatively uniform for its length, with no features (such as rock outcrops or areas of seaweed) that could potentially influence bird distribution.

Sanderling peak counts exceeded the figure for national significance in the 2019/2020 and 2020/2021 seasons. The greatest exceedance of the figure for national significance recorded was a peak of 254 birds in the 2020/2021 season. However, analysis by count sector confirmed that the vast majority of these birds were more than 400 m from the proposed landfall works area. The largest number of sanderling within the likely ZoI of the proposed landfall (i.e. sections 3 and 4; within c. 500 m) was 38 birds (45% of the nationally significant figure).

Bar-tailed godwit were also recorded in peak numbers which exceeded the figure for national significance (peak 335, 197%) during the 2020/2021 season. Analysis by count number, however indicates that all of these birds were recorded in count section 1, outside of the ZoI for the works.

Significant numbers of curlew were also recorded (Peak 109 birds; 31% of the nationally significant figure). Finer analyses by count sector revealed that all birds (in inland fields south of the Ballyvergan Marsh at high tide), were located greater than 800m from the proposed landfall works area. However, it is of note that during the hen harrier roost survey, 97 curlew were recorded flying from Ballyvergan marsh during hen harrier roost surveys in 2019/2020 season.

Oystercatcher were recorded regularly within count sections 3 and 4 (peak count 36, 6% of figure of national significance) in wintering surveys for 2019/2020. Numbers of oystercatcher within the ZoI decreased slightly in wintering surveys for 2020/2021 with a peak count of 26 (4% of figure of national significance) in count section 4.

There were no other noteworthy bird counts recorded within the ZoI (i.e. sections 3 and 4) in late winter 2019.

Table 3.4: Peak monthly counts of SCI species at Redbarn-Claycastle (beach, sea and fields) across all three bird survey seasons. H=High tide; L=Low tide; S =At Sea). Significant counts in bold text.

Species	Birds of Conservation Concern Status[12]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA	Peak Number 2019	Peak Number 2019/2020	Peak Number 2020/2021	Figure of National Significance[13]	Peak as % of Figure of National Significance
Bar-tailed Godwit	Red	✓	✓	✓	6 (L)	152 (L)	**335 (L)**	170	**197**%
Black-headed Gull	Amber	✓	-	✓	9 (L)	9 (H)	368 (L)	1000	37%
Common gull	Amber	✓	-	✓	10 (L)	27 (H)	85 (L)	500	18%
Cormorant	Amber	-	-	✓	1 (H)	2(L)	29 (S)	110	26%
Curlew	Red	✓	✓	✓	57 (H)	85 (L)	109 (L)	350	31%
Dunlin	Red	✓	✓	✓	Not recorded	1 (H)	115 (L)	460	25%
Great crested grebe	Amber	-	-	✓	Not recorded	Not recorded	18 (S)	30	60%
Grey heron	Green	-	-	✓	1 (L)	1 (H)	Not recorded	25	4%
Grey plover	Red	✓	-	✓	Not recorded	1 (H)	10 (L)	30	33%
Lesser black backed gull	Amber	✓	-	✓	4(L)	Not recorded	42 (S)	Not published	n/a
Oystercatcher	Red	-	-	✓	13 (L)	36 (H)	31 (L)	610	6%
Redshank	Red	✓	✓	✓	1 (L)	2 (H)	15 (L)	240	6%
Red breasted merganser	Amber	-	-	✓	Not recorded	Not recorded	2 (S)	25	8%

[12] Gilbert, G., Stanbury, A., Lewis, L. 2021 Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22 .

[13] Fitzgerald, N., Burke, B. & Lewis, L.J. (2021) Irish Wetland Bird Survey: Results of waterbird monitoring in Ireland in 2016/17 and 2017/18. BirdWatch Ireland, Wicklow.

Species	Birds of Conservation Concern Status[12]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA	Peak Number 2019	Peak Number 2019/2020	Peak Number 2020/2021	Figure of National Significance[13]	Peak as % of Figure of National Significance
Ringed plover	Amber	✓	-	-	Not recorded	20 (H)	55 (S)	120	46%
Sanderling	Green	✓	-	-	63 (L)	**159 (H) [during marine surveys]**	**254 (L)**	85	**298%**
Teal	Amber	✓	-	✓	Not recorded	26 (H)	100 (recorded during winter raptor survey)	360	28%
Turnstone	Amber	✓	-	-	Not recorded	1 (H)	5 (L)	95	5.3%

Marine Bird Surveys at Claycastle

Marine bird surveys were carried out in the 2019/2020 season and in the 2020/2021 season. A summary of the data recorded is detailed in Table 3.5 below. In contrast to the intertidal and inland surveys, the counts of marine birds are totals, recorded over the duration of the survey.

It is of note that the species totals in some cases refer to multiple sightings of the same birds as they flew up and down the coast or remained within the survey area for several minutes and this was especially true of gulls. For this reason, the data in Table 3.5 below do not include the counts in the context of nationally significant populations.

Birds seen in flight, but which do not feed at sea (e.g. waders) are excluded from Table 3.5, as they would not be within the zone of influence of disturbance or pollution from onshore activities. Across the two survey seasons a total of 19 different bird species were recorded at the landfall site. Gulls were the most frequently recorded waterbirds in the 2019/2020 surveys with six species recorded accounting for 79% of the sightings. 508 herring gull sightings accounted for 30% of the total and 353 black-headed gull sightings accounted for 21% of the total.

During the 2019/2020 surveys 280 sightings of four species of wader accounted for just 16.67% of the total. Gannet, cormorant and shag sightings (37) accounted for 2.2% of the total. Only two species of wildfowl were recorded (brent goose and common scoter) and their combined totals accounted for just 1.7% of the total.

Bird sightings during 2019/2020 surveys season tended to be higher for most species (especially gulls) during the high tide counts. November was the only month when common scoter and kittiwakes were recorded and this is likely to be directly related to the strong east winds that occurred during this count. The highest numbers of herring gull (212), great-black-backed gull (54) and lesser black-backed gull were all recorded on this count. Unusually large numbers of black-headed gull sightings (143) were notable in the December count. Exceptionally large numbers of common gull sightings (153) were recorded during the January count.

Likewise, in the 2020/2021 surveys, gulls again dominated with records of gulls making up 76.8% of total records for the season. These records were made up of black headed gull (7.7%), common gull (14.6%), herring gull (34.4%), great black backed gull (13%), and lesser black backed gull (5.7%).

The most significant bird species recorded during marine bird surveys in 2020/2021 were the red-listed common scoter, dunlin and curlew, all in very low numbers. The high count of Ringed Plover (55) included single flocks of 50 (HT count) and 5 (MT count). It is of note that dunlin and curlew were all recorded in small numbers, and only in flight offshore, rather than actively using the area to forage. Likewise, the shag was only recorded in flight some distance offshore as were the ringed plover.

Ten of the bird species recorded were SCIs of nearby SPA sites. Details relating to same is provided below in Table 3.5.

Table 3.5: Highest Daily Totals of SCI Species During Marine Bird Surveys at Claycastle from November 2019 and March 2020

Species	Birds of Conservation Concern Status[14]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA	Highest Daily Totals 2019/2020	Highest Daily Totals 2020/2021
Black-headed Gull	Amber	✓	-	✓	143	40
Common gull	Amber	✓	-	✓	153	61
Cormorant	Amber	-	-	✓	13	29
Curlew	Red	✓	✓	✓	-	3
Dunlin	Red	✓	✓	✓	-	10
Great crested grebe	Amber	-	-	✓	-	18
Lesser Black-backed Gull	Amber	✓	-	✓	34	42
Oystercatcher	Red	-	-	✓	-	6
Red breasted merganser	Amber	-	-	✓	-	2
Ringed plover	Amber	✓	-	-	-	55
Sanderling	Green	✓	-	-	-	17

Evaluation for Wintering Bird Importance

In summary, 17 SCI species were recorded during low tide and High tide surveys, and 11 were recorded during marine surveys. Of these, sanderling and bar tailed godwit were the only species recorded that reached National thresholds (>1% national wintering population) of importance (Burke *et al.* 2018).

Based on these survey results, the Claycastle/Ballyvergan area is identified as an important location and an ex situ wintering bird site. Further discussion of these results in the context of the ZoI of the works is provided in section 3.3.4.

Ballyadam / IDA site

Line transect counts following a circular path around the interior of the wider Ballydadam/ IDA site began in January and continued on a monthly basis through to March. A total of 32 species (all of them widespread and common) were recorded during the transects.

In summary the Ballyadam site had typical counts of common resident species. Small numbers of Snipe (Peak = 12) and Teal (Peak = 10) are noteworthy and likely include migrants from Europe/ Iceland which are potential SCI species of SPA's. These are common wintering species throughout Ireland.

In summary, typical common species were recorded and the overall Ballyadam area including the substation site is not a significant ex situ wintering bird site of any SPA.

[14] Gilbert, G., Stanbury, A., Lewsi, L. 2021 Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22 .

3.2.3.3 Field Survey Results Wintering Raptors

A single merlin was recorded on the edge of Ballyvergan marsh in the 2019 surveys. No further records were reported in subsequent survey years.

Up to two roosting winter hen harrier were recorded using the Ballyvergan Marsh in wintering seasons 2019, and 2019/2020 with three recorded in wintering season 2020/2021. This confirms that the Ballyvergan Marsh pNHA continues to be an important winter roost area for hen harrier

Peak counts of species encountered at Ballyvergan Marsh are presented below in Table 3.6

Table 3.6: Peak Counts of Additional SCI Species Recorded During Hen Harrier Winter Roost Surveys at Ballyvergan Marsh

Species	Birds of Conservation Concern Status[15]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	Cork Harbour SPA	Peak recorded in 2019	Peak Number Recorded 2019/2020	Peak Number Recorded 2020/2021	Figure of National Significance	Peak as % of Figure of National Significance (Wetland Birds)
Curlew	Red	✓	✓	✓	-	97	90	350	28%
Grey heron	Green	-	-	✓	-	1	-	25	4%
Hen harrier	Amber	-	-	-	2	3 – 5	3	2 to 3	**150 – 166%**[16]
Teal	Amber	✓	-	✓	-	1	100	360	28%

[15] Gilbert, G., Stanbury, A., Lewsi, L. 2021 Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22 .

[16] Ruddock *et al* (2016)

The numbers of regularly recorded hen harrier (3 to 5) are evaluated as nationally significant relative to the most recent Republic of Ireland breeding population estimates[17]. It is noted though that these counts may include hen harrier that breed elsewhere, such as Northern England and Scotland[18]. Based on maximum counts recorded there would not likely be significant numbers of hen harrier that also use other jurisdictions, outside Ireland. Roosting sites varied significantly, and birds appeared to regularly choose different sites. Roost surveys indicate that there is a distinct preference for roosting on the west side of the marsh. This was consistent across all seasons of survey and the closest roosting bird was estimated to be c.700 metres west of the proposed cable trenching works area within the marsh. It is considered likely, based on a precautionary approach, that the majority of hen harrier recorded using Ballyvergan Marsh are associated with the closest SPA for this species, Mullaghanish to Musheramore Mountains SPA.

3.2.4 European sites

3.2.4.1 Summary of Relevant European sites

Whilst the Proposed Development does not overlap any European sites:

- Two SACs are relevant, due to the potential for downstream pollution effects (Great Island Channel SAC, and Ballymacoda (Clonprieset and Pilmore) SAC
- Four SPAs are relevant, due to the potential for ex-situ bird disturbance effects and/or downstream pollution effects (Ballymacoda Bay SPA, Cork Harbour SPA, Blackwater Estuary SPA, Mullaghanish to Musheramore Mountains SPA);

3.2.4.2 Great Island Channel SAC

Great Island Channel SAC is located approximately 1.7km from the closest extent of the Proposed Development. The site synopsis for the SAC (NPWS, 2013) notes that "*The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.*"

The Natura 2000 Standard Data Form (NPWS 2019c) for the Great Island Channel SAC identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Marine and freshwater aquaculture
- Reclamation of land from sea, estuary or marsh
- Roads, motorways
- Urbanised areas, human habitation

[17] Based on population estimate of 108 to 157 pairs detailed in. Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

[18] Brian Etheridge & Ron W. Summers (2006) Movements of British hen harriers circuscyaneus outside the breeding season, Ringing & Migration, 23:1, 6-14, DOI: 10.1080/03078698.2006.9674338

- Invasive non-native species
- Grazing
- Eutrophication (natural)

As previously noted, invasive non-native species have been recorded during the field surveys for the Proposed Development and may be impacted by the construction phase. None of the other impacts and activities as outlined above are linked to the Proposed Development.

The QIs for which the SAC is designated, the conservation objectives identified for the QIs, and their current national conservation status and trend are outlined in Table 3.7.

Table 3.7: Qualifying Interests for Great Island Channel SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2014d)	National Conservation Status and Trend (NPWS 2019a)
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 Great Island Channel SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **restore** the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Great Island Channel SAC,	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**

In summary, Table 3.7 indicates that

- Only one of the SAC's QIs is in favourable condition within the SAC itself [1140]; and,
- Both of the SAC's QIs are in unfavourable condition nationally.

The known extent of the tidal mudflats and Atlantic salt meadows associated with the site have been mapped in the Site-Specific Conservation objectives (NPWS 2014d). The closest known extent of tidal mudflat within Great Island Channel SAC occurs approximately 2.7km to the south of the Converter Station site, while the closest known extent of Atlantic salt meadows is mapped as occurring approximately 3km to the south.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

3.2.4.3 Ballymacoda (Clonpriest and Pillmore) SAC

Ballymacoda (Clonpriest and Pillmore) SAC is located approximately 2.1 km from the closest extent of the Proposed Development at the landfall site. The Proposed Development requires crossings of nine watercourses with downstream hydrological connectivity to the European site. The site synopsis for the SAC (NPWS 2015e) notes that the European site "*… stretches north-east from Ballymacoda to within about 6 km of Youghal, Co. Cork.*"

The Natura 2000 Standard Data Form for Ballymacoda (Clonpriest and Pillmore) SAC (NPWS 2019d) identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Eutrophication (natural)
- Hunting
- Bait digging / collection

- Pole fishing
- Invasive non-native species
- Grazing
- Taking and removal of animals (terrestrial)
- Dispersed habitation
- Walking, horse-riding and non-motorised vehicles
- Sports pitch

As previously noted, invasive non-native species have been recorded during the field surveys for the Proposed Development and may be impacted by the construction phase. None of the other impacts and activities as outlined above are linked to the Project.

The QIs for which the SAC is designated, the conservation objectives identified for the habitats, and their current national conservation status is outlined in Table 3.8.

Table 3.8: Qualifying Interests for Ballymacoda (Clonpriest and Pillmore) SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2015a)	National Conservation Status and Trend (NPWS 2019a)
Estuaries [1130]	To **maintain** the favourable conservation condition of Estuaries in Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
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 Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Salicornia and other annuals colonising mud and sand [1310]	To **restore** the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **favourable** and the conservation status trend is **stable**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **maintain** the favourable conservation condition of Atlantic salt meadows *Glauco-Puccinellietalia maritimae*) in Ballymacoda (Clonpriest and Pillmore) SAC,	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**

In summary, Table 3.8 indicates that

- Only one of the SAC's QIs [1310] is in favourable condition within the SAC itself.
- The same QI is the only one which is in favourable condition nationally.

The extent of estuaries, tidal mudflats, *Salicornia* mud, and Atlantic salt meadows associated with the site have been mapped in the Site-Specific Conservation objectives (NPWS 2015a). In all cases the closest points to the Proposed Development are associated with the cable route.

The estuaries, tidal mudflat and Atlantic salt meadows are associated with the most northerly point of the SAC, and so occur approximately 2.1km to the south of the onshore cable route at their closest extent. Salicornia mud is mapped slightly further south within the SAC boundary, occurring approximately 2.7km to the south of the cable route.

As previously described, the lands within the footprint of the Proposed Development do not constitute the QIs for which the site is designated. There is, therefore, no potential for the QIs associated with Ballymacoda (Clonpriest and Pillmore) SAC to occur within the red line boundary.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

3.2.4.4 Blackwater River (Cork/Waterford) SAC

Blackwater River (Cork/Waterford) SAC is located approximately 1.4km from the closest extent of the Proposed Development. Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. The site synopsis for the SAC (NPWS 2016) notes that the "*The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains.*"

The Natura 2000 Standard Data Form for Blackwater River (Cork/Waterford) SAC (NPWS 2018a) identifies the following most important impacts and activities with high negative effect on the site:

- Sylviculture, forestry
- Landfill, land reclamation and drying out, general
- Railway lines, TGV
- Disposal of household / recreational facility waste
- Invasive non-native species
- Grazing
- Nautical sports
- Erosion
- Roads, motorways
- Industrial or commercial areas
- Sand and gravel extraction
- Urbanised areas, human habitation
- Fertilisation
- Sport and leisure structures
- Mowing / cutting of grassland
- Leisure fishing

As previously noted, invasive non-native species have been recorded during the field surveys for the Proposed Development and may be impacted by the construction phase. The works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SAC and are assessed in Section 3.3. None of the other impacts and activities as outlined above are linked to the Proposed Development. QIs for which the SAC is designated, the conservation objectives identified for the various habitats and species, and their current conservation status trends are outlined in Table 3.9.

Table 3.9: Qualifying Interests for Blackwater River (Cork/Waterford) SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2012b)	Conservation Status Trend (NPWS 2019a, 2019b)
Estuaries [1130]	To **maintain** the favourable conservation condition of Estuaries in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
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 Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Perennial vegetation of stony banks [1220]	To **maintain** the favourable conservation condition of Perennial vegetation of stony banks in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **stable**
Salicornia and other annuals colonising mud and sand [1310]	To **maintain** the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **favourable** and the conservation status trend is **stable**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **restore** the favourable conservation condition of Atlantic salt meadows (Glauco‐Puccinellietalia maritimae) in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	To **maintain** the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
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 Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	To **restore** the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**
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 Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **bad** and the Conservation Status trend is **deteriorating**

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2012b)	Conservation Status Trend (NPWS 2019a, 2019b)
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	To **restore** the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **bad** and the conservation status trend is **deteriorating**
Austropotamobius pallipes (White-clawed Crayfish) [1092]	To **maintain** the favourable conservation condition of White - clawed Crayfish in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **Bad** and the conservation status trend is **deteriorating**.
Petromyzon marinus (Sea Lamprey) [1095]	To **restore** the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **Bad** and the conservation status trend is **deteriorating**.
Lampetra planeri (Brook Lamprey) [1096]	To **maintain** the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **stable**.
Lampetra fluviatilis (River lamprey) [1099]	To **maintain** the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **unknown** and the conservation status trend is **not available.**
Alosa fallax fallax (Twaite shad) [1103]	To **restore** the favourable conservation condition of Twaite Shad in the Blackwater River (Cork/Waterford) SAC,	The overall conservation status for the species is **bad** and the conservation status trend is **stable**.
Salmo salar (Salmon) [1106] (only in fresh water)	To **maintain** the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **inadequate** and the conservation status trend is **stable**
Lutra lutra (Otter) [1355]	To **restore** the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **improving**
Trichomanes speciosum (Killarney Fern) [1421]	To **maintain** the favourable conservation condition of Killarney Fern in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **stable**
Taxus baccata woods	The conservation objectives note that "*The status of Taxus baccata woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. The outcome of this review will determine whether a site - specific conservation objective is set for this habitat*"	

In summary, Table 3.9 indicates that:

- For seven of QIs the conservation status is listed as inadequate, and for the majority of the QIs the conservation trend is deteriorating
- Six QIs have conservation status that is bad and only three are listed as favourable.

  The known extents of a number of the habitats associated with the European site boundary have been mapped in the Site-Specific Conservation objectives or referenced in the site synopsis. It is of note that some habitats and species may extend beyond and occur outside the European site boundary. The closest extents of these QIs inside of the SAC as mapped in the conservation objectives (NPWS 2012b) are outlined in Table 3.10 hereunder:

Table 3.10: Known Locations for Qualifying Interest in Relation to the Proposed Development

Qualifying Interest	Known Location in Relation to the Project
Estuaries	Estuaries are mapped at their closest point 1.4km from the Proposed Development.
Mudflats and sandflats not covered by seawater at low tide	Mudflats and sandflats not covered by seawater at low tide are mapped at their closest point at 1.4km from the Proposed Development
Perennial vegetation of stony banks [1220]	Perennial vegetation of stony banks has not been mapped for this European site. The site synopsis notes that the shingle spit at Ferrypoint supports a good example of this habitat. Ferrypoint is located approximately 2.5km from the Proposed Development.
Salicornia and other annuals colonising mud and sand	Salicornia and other annuals colonising mud and sand has not been mapped for this European site. The site synopsis notes that areas of Salicornia mud are found on the eastern side of the townland of Foxbole above Youghal, at Blackbog, and along the Tourig and Kinsalebeg estuaries. The closest of these is located approximately 2.5km from the Proposed Development.
Atlantic salt meadows	Atlantic salt meadows are mapped at their closest extent approximately 3.5km from the Proposed Development.
Mediterranean salt meadows	Mediterranean salt meadows are mapped at their closest extent approximately 4.4km from the Proposed Development
Floating river vegetation	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation have not been mapped within the European site. The site synopsis notes that floating river vegetation is found along much of the freshwater stretches within the site. The freshwater watercourse to the works that has connectivity to the European site is located approximately 2.5km north of the Proposed Development.
Old sessile oak woods	Old sessile oak woods have been mapped at their closest extent approximately 4.7km from the Proposed Development.
Alluvial forests	Alluvial woodlands have been mapped at their closest extent approximately 20km from the Proposed Development.
Freshwater Pearl Mussel)	Catchments associated with freshwater pearl mussel, along with areas identified as suitable habitat and their target distribution have been mapped. The Proposed Development is not located within such a catchment. The closest such freshwater catchment is mapped at 6.5km from the Proposed Development.
White-clawed Crayfish	Freshwater crayfish within the Blackwater (Cork/Waterford) SAC are identified as being largely within the Awbeg river. The Awbeg river is located approximately 38km from the project. In recent years crayfish have been recorded on other tributaries of the Blackwater. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Project. Furthermore, the Favourable Reference Range for the species does not overlap the Proposed Development, or catchments downstream of it.
Sea Lamprey	Sea lamprey records within the SAC relate to spawning habitat for the species. The closest extent of such is located approximately 18km from the works. Further, the freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Proposed Development. Lamprey habitat was recorded along a number of watercourses during aquatic surveys carried out. The closest of these rivers to the Blackwater river is located 13km away (hydrological route).
Brook Lamprey River Lamprey	River and brook lamprey are associated with the freshwater extents of the SAC. The closest freshwater watercourse with connectivity to the European site is located approximately 2.5km from the Proposed Development. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Proposed Development with no downstream connectivity.

Qualifying Interest	Known Location in Relation to the Project
	Lamprey habitat was recorded along a number of watercourses during aquatic surveys carried out. The closest of these rivers to the Blackwater river is located 13km away (hydrological route). River lamprey can occur in coastal waters.
Twaite Shad	The extent of twaite shad has not been mapped in the conservation objectives mapping. Records have, however, been provided in the rare and protected species mapping from the NPWS. The Current Range and Favourable Reference Range overlap the Blackwater River and Estuary, in the vicinity of the Proposed Development. The closest record to the Proposed Development.is located approximately 2.3km from the Proposed Development.
Atlantic salmon (freshwater)	The conservation objectives for the Blackwater River (Cork/Waterford) SAC specify that Atlantic salmon are designated only in terms of their freshwater extent (although associated attributes account for migratory routes) . The closest freshwater watercourse with connectivity to the European site is located approximately 2.5km from the Proposed Development. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Proposed Development with no downstream hydrological connectivity to the Proposed Development.
Otter	The conservation objectives for the Blackwater River (Cork/Waterford) SAC map otter habitat at its closest extent at the edge of the European site boundary 1.4km from the Proposed Development. Otter signs were recorded along a number of watercourses during aquatic surveys. The closest of these rivers to the Blackwater river SAC is located 13km away (hydrological route).
Killarney fern	Killarney fern is recorded in two locations within the SAC. The closest of these is located approximately 7.2km from the Proposed Development.at it's closest point.

As described previously there is no potential for habitats associated with the SAC to occur within the footprint of the Proposed Development. While there is connectivity within the coastal waters, the habitats for which the SAC is designated are located north of the mouth of the estuary within the Blackwater River system. There is potential, however, for a number of QIs associated with the SAC to occur outside of the European Site boundary in proximity to the Proposed Development. These are as follows:

- Twaite shad may be present within the coastal waters adjacent to the works area. There is potential, therefore, for twaite shad to be present in close proximity to the works areas. No rivers within the works footprint are known to be used by twaite shad and the main populations are in the River Blackwater which is not hydrologically linked to the development. Twaite Shad associated with this SAC are not likely to be within the zone of influence of the proposed development.
- Suitable brook and/ or river lamprey habitat was recorded on a number of watercourses along the proposed cable route. The closest of these rivers to the SAC is located approximately 13km away (Hydrological route), in a separate catchment with no direct hydrological linkage. Given the nature of the lifecycles of these species, entirely within individual river catchments, there is not likely to be significant linkage between populations encountered and the Blackwater Estuary SAC populations
- Atlantic salmon potentially spawn in some of the watercourses along the proposed route. The closest of these rivers to the SAC is located approximately 13km away, in a separate river catchment with no direct hydrological linkage. Given the nature of the lifecycles of Atlantic salmon during freshwater aquatic phase of lifecycle typically within individual river catchments, there is not likely to be significant linkage between populations encountered and the Blackwater Estuary SAC populations.
- Otter signs were recorded along a number of watercourses during aquatic surveys. The closest of these rivers is located 13km from the SAC. No otter signs, holts or couches were

recorded within 150m of the works areas at the landfall, or at Ballyvergan Marsh. Otter may, however, utilise these areas commuting and foraging at least on occasion. Otter were also recorded use river crossings along the proposed cable route. Otter female home ranges have been shown to average 7.5 ± 1.5 km (O'Neill *et.,* 2009). It is possible that individuals (males in particular) may move between the Blackwater River catchment and the study area.

3.2.4.5 Cork Harbour SPA

Cork harbour SPA is located approximately 2.5km from the closest extent of the Proposed Development. The Proposed Development requires six watercourse crossings with downstream hydrological connectivity to the European site. The site synopsis for the SPA (NPWS 2015d) notes that "*Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra.*"

The Natura 2000 Standard Data Form (NPWS 2018b) for Cork Harbour SPA identifies the following most important impacts and activities with high negative effect on the site[19]:

- Pole fishing
- Industrial or commercial areas
- Nautical sports
- Shipping lanes
- Walking, horse riding and non-motorised vehicles
- Roads, motorways
- Urbanised areas, human habitation
- Dispersed habitation
- Marine and Freshwater Aquaculture
- Fertilisation

The Proposed Development is located entirely outside of the boundary of the SPA. As previously noted, the works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SPA. None of the other impacts and activities as outlined above are linked to the Proposed Development.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current conservation status trends are outlined in Table 3.11.

Table 3.11: Special Conservation Interests for Cork Harbour SPA

Special Conservation Interests	Conservation Objective (NPWS 2014c)	Population Trends (NPWS 2012d)
Little grebe (*Tachybaptus ruficollis*) [A004] [A690]	To **maintain** the favourable conservation condition of Little Grebe in Cork Harbour SPA,	The overall population long-term trend for the species is listed as **unknown**.
Great crested grebe (*Podiceps cristatus*) [A005]	To **maintain** the favourable conservation condition of Great Crested Grebe in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**.
Cormorant (*Phalacrocorax carbo*) [A017]	To **maintain** the favourable conservation condition of Cormorant in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing.**

[19] Skiing, off-piste was also listed among the impacts and activities, however given that this is not an activity carried out in Cork it is removed.

Special Conservation Interests	Conservation Objective (NPWS 2014c)	Population Trends (NPWS 2012d)
Grey heron (*Ardea cinerea*) [A028]	To **maintain** the favourable conservation condition of Grey Heron in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **stable.**
Shelduck (*Tadorna tadorna*) [A048]	To **maintain** the favourable conservation condition of Shelduck in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Wigeon (*Anas penelope*) [A050]	To **maintain** the favourable conservation condition of Wigeon in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **decreasing**.
Teal (*Anas crecca*) [A052]	To **maintain** the favourable conservation condition of Teal in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Pintail (*Anas acuta*) [A054]	To **maintain** the favourable conservation condition of Pintail in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown.**
Shoveler (*Anas clypeata*) [A056]	To **maintain** the favourable conservation condition of Shoveler in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Red-breasted merganser (*Mergus serrator*) [A069]	To **maintain** the favourable conservation condition of Red-breasted Merganser in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **stable**.
Oystercatcher (*Haematopus ostralegus*) [A130]	To **maintain** the favourable conservation condition of Oystercatcher in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**
Golden plover (*Pluvialis apricaria*) [A140]	To **maintain** the favourable conservation condition of Golden Plover in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**
Grey plover (*Pluvialis squatarola*) [A141]	To **maintain** the favourable conservation condition of Grey Plover in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Lapwing (*Vanellus vanellus*) [A142]	To **maintain** the favourable conservation condition of Lapwing in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **decreasing**
Dunlin (*Calidris alpina*) [A149]	To **maintain** the favourable conservation condition of Dunlin in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Black-tailed godwit (*Limosa limosa*) [A156]	To **maintain** the favourable conservation condition of Black-tailed Godwit in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Bar-tailed godwit (*Limosa lapponica*) [A157]	To **maintain** the favourable conservation condition of Bar-tailed Godwit in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Curlew (*Numenius arquata*) [A160]	To **maintain** the favourable conservation condition of Curlew in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Redshank (*Tringa totanus*) [A162]	To **maintain** the favourable conservation condition of Redshank in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**

Special Conservation Interests	Conservation Objective (NPWS 2014c)	Population Trends (NPWS 2012d)
Greenshank (*Tringa nebularia*) [A164]	To **maintain** the favourable conservation condition of Greenshank in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Black-headed gull (*Chroicocephalus ridibundus*) [A179]	To **maintain** the favourable conservation condition of Black-headed Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Common gull (*Larus canus*) [A182]	To **maintain** the favourable conservation condition of Common Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Lesser black-backed gull (*Larus fuscus*) [A183]	To **maintain** the favourable conservation condition of Lesser Black-backed Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Common tern (*Sterna hirundo*) [A193]	To **maintain** the favourable conservation condition of Common Tern in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Wetlands	To **maintain** the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.	Not applicable

In summary Table 3.11 shows that:

- Only three SCIs associated with the SPA are identified as having long term trends that are increasing; and,
- Eighteen SCIs show either unknown or decreasing long term trends.

Site specific conservation objective mapping for the site (NPWS 2014c) has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development is located approximately 2.5km to the south of the cable route. The NPWS data for this roost (albeit recorded during a single winter in 2010) is associated with redshank, teal and shelduck.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document (NPWS 2014c) notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the Converter Station site. Some populations, assumed to be SCI populations in the absence of evidence to the contrary, were recorded here, as well as at Claycastle beach.

Peak counts, and corresponding significance as a percentage of the Figure of National Significance are presented in Table 3.10, for birds within the ZoI of the Proposed Development at Claycastle beach (three seasons; 2019-2021) and the Converter Station site (one season; 2019/2020).

Table 3.12: Peak Counts of Special Conservation Interests for Cork Harbour SPA within ZoI of Proposed Development; from field data (2019-2021). Notable counts in bold

Species	Conservation Status (Gilbert et al., 2021)	Peak within ZoI (H=High; L=Low; S= at sea)	Other notable counts within ZoI	Location	Figure of National Significance (Burke et al., 2018)	Peak as % of Figure of National Significance
Black-headed gull	Amber	143	7(L)	Offshore at Claycastle beach Claycastle Beach (Count Sector 3)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
Common gull	Amber	153 (S)	10 (L/H)	Offshore at Claycastle beach Claycastle Beach (Count Sector 4)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
Cormorant	Amber	1 (H) 13 (S)	None	Claycastle Beach (Count Sector 3)	110	1% (on Claycastle beach) 12% (offshore from Claycastle)
Curlew	**Red**	**97 (N/A)**	None	**Ballyvergan Marsh**	**350**	**28%**
Dunlin	Red	10 (S)	None	Offshore at Claycastle beach	460	2%
			1 (H)	Claycastle Beach (Count Sector 3)	460	<1%
Grey heron	Green	1(N/A)	None	Ballyadam	105	1%
Lesser black-backed gull	Amber	4 (L)	None	Claycastle Beach (Count Sector 4)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
		6 (N/A)	None	Ballyadam		
Oystercatcher	**Amber**	**36 (H)**	**14, 12, 10**	**Claycastle Beach (Count Sector 3)**	**610**	**33%**
Red-breasted merganser	Amber	2 (S)	None	Offshore at Claycastle beach	25	8%
Teal	Amber	10 (N/A)	10	Ballyadam	360	7%
		100		Ballyvergan Marsh	360	28%

Table 3.10 shows that no SCI populations within the ZoI were recorded close to 100% of the figure of national significance. Only oystercatcher (33%), curlew (28%) and teal (28%) were recorded in notable numbers. However, ten species recorded within the ZoI are SCI species of Cork Harbour SPA. The potential for impact on these species is discussed further below.

The following SCI species were also recorded during surveys in the wider survey (which extended up to 1.5 km from the Proposed Development, but were outside the ZoI of potential disturbance effects (c. 0.4 km; see 2.4.1) and as such are not discussed further.

- Bar-tailed godwit (peak count of 335 birds at Claycastle count sector 1)
- Redshank (peak count of 15 birds at Claycastle count sector 1)

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

As outlined previously, the potential for hydrological connectivity to the SPA has been identified through water crossings, and underground conduits within the Converter Station site.

The following SCIs are, therefore, carried through for further discussion:

- Black-headed gull
- Common gull
- Cormorant
- Curlew
- Dunlin
- Grey heron
- Lapwing
- Lesser black-backed gull
- Oystercatcher
- Red-breasted merganser
- Teal
- Wigeon
- Wetlands and Waterfowl

3.2.4.6 Ballymacoda Bay SPA

Ballymacoda Bay SPA is located approximately 1.5km from the closest extent of the Proposed Development. The Proposed Development requires watercourse crossings with downstream hydrological connectivity to the European site. The site synopsis for the SPA (NPWS 2014h) notes that "*This coastal site stretches north-east from Ballymacoda to within several kilometres of Youghal, Co. Cork.*"

The Natura 2000 Standard Data Form (NPWS 2018) for Ballymacoda Bay SPA identifies the following most important impacts and activities with high negative effect on the site:

- Leisure fishing
- Industrial or commercial areas
- Nautical sports
- Shipping lanes
- Walking, horse-riding and non-motorised vehicles
- Roads, motorways
- Urbanised areas, human habitation
- Dispersed habitation

- Marine and Freshwater Aquaculture
- Fertilisation
- Port areas

The Proposed Development is located entirely outside of the boundary of the SPA. As previously noted, the works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SPA. None of the other impacts and activities as outlined above are linked to the Project.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current population trends are outlined in Table 3.13.

Table 3.13: Special Conservation Interests for Ballymacoda Bay SPA

Special Conservation Interests	Conservation Objective (NPWS 2015c)	Population Trends (NPWS 2012d)
Wigeon (*Anas penelope*) [A050]	To maintain the favourable conservation condition of Wigeon in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Teal (*Anas crecca*) [A052]	To maintain the favourable conservation condition of Teal in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Ringed Plover (*Charadrius hiaticula*) [A137]	To maintain the favourable conservation condition of Ringed Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Golden plover (*Pluvialis apricaria*) [A140]	To maintain the favourable conservation condition of Golden Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Grey plover (*Pluvialis squatarola*) [A141]	To maintain the favourable conservation condition of Grey Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Lapwing (*Vanellus vanellus*) [A142]	To maintain the favourable conservation condition of Lapwing in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Sanderling (*Calidris alba*) [A144]	To maintain the favourable conservation condition of Sanderling in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **increasing**
Dunlin (*Calidris alpina*) [A149]	To maintain the favourable conservation condition of Dunlin in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Black-tailed godwit (*Limosa limosa*) [A156]	To maintain the favourable conservation condition of Black-tailed Godwit in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **increasing**
Bar-tailed godwit (*Limosa lapponica*) [A157]	To maintain the favourable conservation condition of Bar-tailed Godwit in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**

Special Conservation Interests	Conservation Objective (NPWS 2015c)	Population Trends (NPWS 2012d)
Curlew (*Numenius arquata*) [A160]	To maintain the favourable conservation condition of Curlew in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Redshank (*Tringa totanus*) [A162]	To maintain the favourable conservation condition of Redshank in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Turnstone (*Arenaria interpres*) [A169]	To maintain the favourable conservation condition of Turnstone in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Black-headed gull (*Chroicocephalus ridibundus*) [A179]	To maintain the favourable conservation condition of Black-headed Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Common gull (*Larus canus*) [A182]	To maintain the favourable conservation condition of Common Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Lesser Bback-backed gull (*Larus fuscus*) [A183]	To maintain the favourable conservation condition of Lesser Black-backed Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Wetland and Waterbirds [A999]	To maintain the favourable conservation condition of the wetland habitat in Ballymacoda Bay SPA as a resource for the regularly occurring migratory birds that utilise it.	Not applicable

In summary Table 3.13 notes that with the exception of two SCIs the long term conservation trends are all either unknown or decreasing.

Site specific conservation objective mapping for the site has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development, which contains records of SCIs associated with Ballymacoda Bay SPA is located approximately 3.6km from the development.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the eastern extent of the cable route at Claycastle.

Peak counts, and corresponding significance as a percentage of the Figure of National Significance are presented in Table 3.14, for birds within the ZoI of the Proposed Development at Claycastle beach (three seasons; 2019-2021) and the Converter Station site (one season; 2019/2020).

Table 3.14: Peak Counts of Special Conservation Interests for Ballymacoda Bay SPA within ZoI of Proposed Development; from field data (2019-2021). Notable counts in bold

Species	Conservation Status (Gilbert et al., 2021)	Peak within ZoI (H=High; L=Low;	Other Notable Counts within ZoI	Location	Figure of National Significance (Burke et al., 2018)	Peak as % of Figure of National Significance
Black-headed gull	Amber	143	None	Offshore at Claycastle beach	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
Common gull	Amber	138	None	Offshore at Claycastle beach	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
Curlew	**Red**	**97 (N/A)**		**Ballyvergan Marsh**	**350**	**28%**
Dunlin	Red	10 (S)	1 (H)	Offshore at Claycastle beach Claycastle Beach (Count Sector 3)	460	2%
Lesser black-backed gull	Amber	4 (L)	None	Claycastle Beach (Count Sector 4)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI
		6 (N/A)	None	Ballyadam		
Ringed plover	**Amber**	**50(S)**	**20 (L)**	**Claycastle Beach (Count Sector 4)**	**120**	**42%**
Sanderling	**Green**	**159 (L)**	**50, 38**	**Claycastle Beach (Count Sector 4)**	**85**	**138%**
Teal	Amber		24 (N/A)	Ballyadam	Ballyadam	7%
			10 (N/A)	Ballyvergan Marsh	Ballyvergan Marsh	3%

Table 3.14 shows that one SCI population within the ZoI - Sanderling -was recorded exceeding 100% of the figure of national significance. While curlew (28%) and ringed plover (42%), were the only other SCI population recorded in notable numbers eight SCI species were recorded within the ZoI and may suffer disturbance effects from the works.

The following SCI species were also recorded during surveys in the wider survey (which extended up to 1.5 km from the Proposed Development, but were always recorded outside the identified ZoI of potential disturbance effects (c. 0.4 km; see Section 2.4.1) and as such are not discussed further.

- Bar-tailed godwit (peak count of 335 birds at west end of Claycastle)
- Redshank (peak count of 15 birds at west end of Claycastle beach)
- Turnstone (peak count 5 individuals at west end of Claycastle beach)
- Grey Plover – peak count 10 individuals at west end of Claycastle beach)

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

Given their presence within the ZoI, the following SCIs are, therefore, carried forward for further discussion:

- Black-headed gull
- Common gull
- Curlew
- Dunlin
- Lapwing
- Lesser black-backed gull
- Ringed plover
- Sanderling
- Teal
- Wigeon
- Wetlands and Waterfowl

3.2.4.7 Blackwater Estuary SPA

Blackwater Estuary SPA is located approximately 2.5km from the closest extent of the Proposed Development. Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. The site synopsis for the SPA (NPWS 2014i) notes that "*The Blackwater Estuary SPA is a moderately-sized, sheltered south-facing estuary, which extends from Youghal New Bridge to the Ferry Point peninsula, close to where the river enters the sea.*"

The Natura 2000 Standard Data Form (NPWS 2018) for Blackwater Estuary SPA identifies the following most important impacts and activities having a (highly) negative effect on the site:

- Hunting
- Fertilisation
- Roads, motorways
- Leisure fishing
- nautical sports
- Urbanised areas, human habitation
- Grazing

The Proposed Development is located entirely outside of the boundary of the SPA as such, none of the impacts and activities as outlined above are linked to the Proposed Development.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current population trends are outlined in Table 3.15.

Table 3.15: Special Conservation Interests for the Blackwater Estuary SPA

Special Conservation Interests	Conservation Objective (NPWS 2012c)	Population Trends (NPWS 2012d)
Wigeon (*Anas penelope*) [A050]	To **maintain** the favourable conservation condition of Wigeon in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Golden Plover (*Pluvialis apricaria*) [A140]	To **maintain** the favourable conservation condition of Golden Plover in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **unknown**.
Lapwing (*Vanellus vanellus*) [A142]	To **maintain** the favourable conservation condition of Lapwing in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing**.
Dunlin (*Calidris alpina*) [A149]	To **maintain** the favourable conservation condition of Dunlin in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Black-tailed Godwit (*Limosa limosa*) [A156]	To **maintain** the favourable conservation condition of Black - tailed Godwit in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **increasing.**
Bar-tailed Godwit (*Limosa lapponica*) [A157]	To **maintain** the favourable conservation condition of Bar - tailed Godwit in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Curlew (*Numenius arquata*) [A160]	To **maintain** the favourable conservation condition of Curlew in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Redshank (*Tringa totanus*) [A162]	To **maintain** the favourable conservation condition of Redshank in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Wetland and Waterbirds [A999]	To **maintain** the favourable conservation condition of the wetland habitat in Blackwater Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it	Not applicable

As indicated in Table 3.15 only two species are listed as having long term conservation trends as increasing, with the remaining SCIs either unknown or decreasing.

Site specific conservation objective mapping for the site has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development, which contains records of SCIs associated with Blackwater Estuary SPA is approximately 3.6km from the development.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the eastern extent of the cable route at Claycastle.

Peak counts, and corresponding significance as a percentage of the Figure of National Significance are presented in Table 3.16for birds within the ZoI of the Proposed Development at Claycastle beach (three seasons; 2019-2021) and the Converter Station site (one season; 2019/2020).

Table 3.16: Peak Counts of Special Conservation Interests for Blackwater Estuary SPA within ZoI of Proposed Development; from field data (2019-2021). Notable counts in bold

Species	Conservation Status (Gilbert et al., 2021)	Peak within ZoI (H=High; L=Low;	Other notable counts within ZoI	Location for Peak	Figure of National Significance (Burke et al., 2018)	Peak as % of Figure of National Significance
Curlew	**Red**	97 (N/A)	**None within ZoI**	**Ballyvergan Marsh**	**350**	**28%**
Dunlin	Red	10 (S)		Offshore at Claycastle beach	460	2%
			1 (H)	Claycastle Beach (Count Sector 3)	460	<1%

Table 3.16 shows that no SCI populations within the ZoI were recorded close to 100% of the figure of national significance. While two SCI species were recorded within the ZoI, only curlew (28%) were recorded in notable numbers.

The following SCI species were also recorded during surveys in the wider survey (which extended up to 1.5 km from the Proposed Development, but were outside the ZoI of potential disturbance effects (c. 0.4 km) and as such are not discussed further

- Bar-tailed godwit (peak count of 335 birds at Claycastle count sector 1)
- Redshank (peak count of 15 birds at Claycastle count sector 1)

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

Given their occurrence within the ZoI, the following SCI species are carried forward for further discussion:

- Curlew
- Dunlin
- Lapwing
- Teal
- Wigeon
- Wetland and Waterbirds

3.2.4.8 Mullaghanish to Musheramore Mountains SPA

Mullaghanish to Musheramore Mountains SPA is located approximately 45km from the closest extent of the Proposed Development. This is the closest Hen Harrier SPA breeding site to the Proposed Development and hence can be considered the most likely potential source of wintering Hen Harrier using Ballyvergan Marsh. For the purposes of this assessment all

breeding Hen Harrier SPA's are considered. The site synopsis for the Mullaghanish to Musheramore Mountains SPA (NPWS 2012e) notes that "*The Mullaghanish to Musheramore Mountains SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains in Co. Cork. It is divided roughly into two sectors by the R582 road between Macroom and Millstreet"*

The most recent monitoring data from the Hen Harrier Project (2020) notes the following about the SPA:

"*The Hen Harrier population in the Mullaghanish to Musheramore Mountains SPA at designation was five breeding pairs. This population had undergone a serious decline until a recovery in 2020. No pairs were recorded breeding in the SPA in 2014 and between 2015 - 2019 the population fluctuated between one and two pairs. There were four successful pairs which fledged ten young in 2020 with brood sizes of four, three, two and one respectively. One pair failed at the late chick stage, most likely due to predation*."

The Natura 2000 Standard Data Form (NPWS 2018) for Mullaghanish to Musheramore Mountains SPA identifies the following most important impacts and activities with (highly) negative effects on the site:

- Grazing
- Peat extraction
- Silviculture, forestry
- Roads, motorways
- Paths, tracks, cycling tracks
- Dispersed habitation

None of the impacts and activities as outlined above are linked to the Proposed Development.

The SPA is designated solely for hen harrier (*Circus cyaneus*) [A082]. Generic conservation objectives are available for the site (NPWS 2020) which state the objective as "*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*". The national long-term population trends for wintering hen harrier are listed as unknown in the latest NPWS' Article 12 reporting available (for the period 2008-2012). However, the short-term trends are severe, with decreases of c. 40%.

It is of note that hen harrier have been found to migrate outside of breeding grounds to winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990). Birdwatch Ireland (2020) note that the species "*spends winter in more coastal and lowland areas throughout Irela*nd".

A recent study (O'Donoghue 2021) of the ecology and conservation of the hen harrier during non-breeding season in Ireland notes renewable energy developments and associated infrastructure among the most common pressures. The study goes on to note that pressures on the species outside of the breeding season may have repercussions on over-winter survival and fitness. This may have in-combination effects in relation to the limitation of population numbers, and ultimately the decline of the species.

Three years of wintering bird surveys from 2019-2021 recorded hen harrier regularly at Ballyvergan marsh. The survey reported a maximum of between three and five roosting Hen Harrier between November and March. The roost surveys indicate that the hen harriers within Ballyvergan marsh prefer the western side of the marsh and may occur within 700m of the Proposed Development. While it is not clear where the birds migrate to for the breeding season, having regard to the precautionary principal, it is assumed that these are most likely to

be associated with the closest SPA Mullaghanish to Musheramore Mountains SPA. All SPA breeding Hen Harrier populations are considered.

3.3 Impact Prediction

The potential for impacts on the QIs/SCIs of European sites, as outlined above, associated with the construction and operational phases of the Proposed Development are discussed hereunder.

3.3.1 Construction Phase Impact Types

The layout of the section is such that the overarching potential for impact types is outlined first initially in greater detail in Section 3.3.1. Site impacts to specific European sites are then outlined in Section 3.3.2.

3.3.1.1 Direct Impact to Qualifying Interests / Special Conservation Interests

The potential for mobile QIs/SCIs to occur outside of European site boundaries has been identified. As such, there is potential for direct impacts to these QIs/SCIs or their supporting habitats.

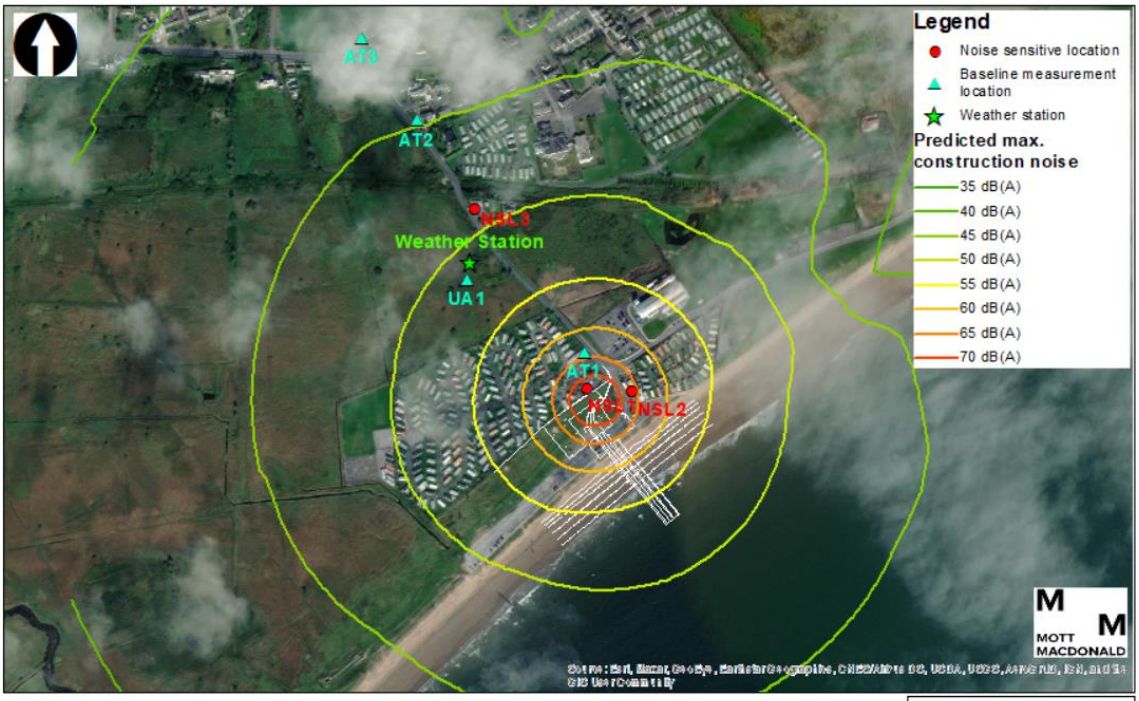
The potential for direct impacts to specific QIs/SCIs is discussed below in the context of each European site.

3.3.1.2 Noise and Vibration

Activities such as vehicle movements/loading, presence of construction staff, breaking of road surfaces, removal of roadside and off road vegetation, laying of cable ducting, and construction of the Converter Station will result in elevated noise levels. A number of QIs/SCIs associated with European sites in the vicinity of the works have the potential, as outlined in section 3.3, to occur within the zone of impact of the works. Noise modelling for the works has been carried out. The extent of the zone of impact is variable dependant on the location where works are to be carried out, with the highest noise levels associated with more impulsive type works (for example sheet piling associated with the temporary works for option 1 at the Claycastle landfall, which protrude above the HWM). The baseline noise levels were calculated as between 55.5 $L_{Aeq,T}$ dB and 61.7 $L_{Aeq,T}$ dB. Modelling of the noise levels likely to be associated with the construction phase (Figure 3.7) of the works indicates that even at the highest levels of noise, at a distance of approximately 380m from the works, noise impacts will be back to baseline levels. Noise levels fall below 70 dB(A)within 55m of the sheet piling works. As such, a zone of impact for noise associated with the construction phase of the Proposed Development is taken as 380m, but conservatively rounded up to 400m, for simplicity.

The potential for impacts to specific QIs/SCIs caused by noise and vibration is discussed below in the context of each European site.

Figure 3.7: Noise Modelling at the Landfall Location



Kilometers
0 0.125 0.25

Source: Mott MacDonald 2020

3.3.1.3 Pollution/Sedimentation Associated with Construction

The proposed works require the excavation of the cable route, infrastructure at the connection point, construction of the Converter Station, and significant temporary works at the landfall site. Where excavations are within areas with high water tables there will be a requirement for pumping out of these excavations. Minor watercourses will be crossed instream (albeit in the dry), using an open cut technique. There is potential, therefore, for the generation of sediment laden water, and/or waterborne chemical pollutants associated with the construction phase of the works.

Works will require the use of concrete at the landfall location, along the cable route (along the base of the cable trench, prior to duct installation), through the footprint of the proposed Converter Station site and within the fence line of the existing Knockraha substation . There is potential for the accidental release of concrete due into nearby surface water features to these works.

The Converter Station will require the use of reinforced concrete piles as part of the foundation of the structure. There is potential that during the drilling of these piles, karst features will be encountered beneath the Converter Station. The assumption of connectivity with European sites through potential underground conduits is being made. As such, there is potential for the release of concrete into European sites associated with these works.

The potential for impacts to specific QIs/SCIs caused by pollution and sedimentation caused by the works is discussed below in the context of each European site.

3.3.1.4 Human and Machinery presence – visual disturbance

Human and machinery presence (visual) at Ballyvergan Marsh and Claycastle Beach may cause localised temporary displacement/ disturbance during the non-breeding season for specific SCI birds. The most sensitive periods are likely to be dusk roost times for hen harrier and (during winter) high tides at Claycastle beach when wader species (e.g. sanderling and bar-tailed godwit) are roosting. The potential for impacts to specific SCIs caused by visual disturbance/ displacement is discussed below in the context of each relevant European site.

3.3.1.5 Dewatering Associated with construction

There is potential for dewatering associated with construction to cause a localised draw down in groundwater. The Scottish Environmental Protection Agency (2014) specifies the zone of influence for Ground Water Dependant Terrestrial Ecosystems (GWDTE) from excavations deeper than 1m to be a 250m buffer around the works area. There are no GWDTEs associated with European sites located within a very large distance from the Proposed Development. The nearest known GWDTE to the Proposed Development (from the list compiled by the EPA (Kimberley and Coxon, 2013) is QI Alluvial Woodland near Cappoquin (NPWS 2012b), in the Blackwater River (Cork/Waterford) SAC, located c. 20km upstream of the Proposed Development as the crow flies.

3.3.1.6 Introduction/Spread of Invasive Species

Japanese knotweed, three cornered leek, sea buckthorn and Himalayan balsam have been recorded during site walkovers of the Proposed Development. Japanese knotweed and Himalayan balsam stands were recorded in locations where intersection with the cable route is likely. Locations of stands of invasive species are provided in Appendix B. As such, there is potential for the dispersal of invasive species caused by construction activities.

The potential for impacts to specific QIs/SCIs by the introduction or spread of invasive species caused by the works is discussed below in the context of each European site.

3.3.1.7 Dust

The proposed construction works will include extensive excavation activities, drilling, stripping of soil and the storing of spoil material. Breaking out of surfaces is required where the cable runs through existing hard standing surfaces. All activities have the potential to result in the generation of dust over the duration of the construction works. The Institute of Air Quality Management '*Guidance on the Assessment of dust from demolition and construction*' (Holman et al, 2014) prescribes potential dust emission risk classes to ecological receptors. The guidelines specify that receptor sensitivity is 'High' up to 20m from the source and reduces to 'Medium' at 50m from the source. Dust may also be generated from track-out due to heavy duty vehicle (HDV) movements from the Converter Station site entrance. The proposed earthworks associated with the construction phase of the Proposed Development are considered 'Large' as per the guidelines as the Proposed Development is greater than 100,000m^2. Track out is measured from the side of the roads used by construction traffic. It is anticipated that a peak of approximately 40 HDV vehicle movements will travel to and from the Proposed Development each day. Referring to the guidelines, track-out was determined as 'Medium' which equates to dust occurring up to 50-100m from the site. The spatial limit of dust impacts is therefore determined as 100m from the access tracks.

No European sites are located within 100m of the Proposed Development site or access tracks. Further, no SCIs or QIs of European sites within the ZoI of the Proposed Development with sensitivities to dust deposition (e.g. Salt Marsh) have been identified within 100m of the Proposed Development.

The deposition of dust into a watercourse can increase suspended solid content of the watercourse which can result in a degradation of water quality and aquatic vegetation downstream. However, the intertidal habitats downstream would (unlike, for instance, sensitive freshwater features) not be affected by such siltation effects. Such effects would form part of silt and sedimentation runoff and is discussed under section 3.5.1.3 above.

3.3.2 Effect Pathways During Construction

The potential for impacts to each European site is outlined in the relevant section hereunder. Where the potential for impact is identified this is assessed against the conservation objectives in section 3.4. In-combination effects are provided thereafter, in Section 3.3.5.

3.3.2.1 Great Island Channel SAC

Direct Impacts to Habitats

The works are located outside of the European site boundary, and no habitats for which the site is designated (as outlined in section 3.3) have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts associated with the works.

Potential for Noise and Vibration Effects

There are no noise or vibration sensitive QIs associated with Great Island Channel SAC.

Pollution Associated with Construction

Hydrological connectivity has been identified to Great Island Channel through four watercourses and is assumed through potential underground conduits, assumed to be present beneath the Converter Station site. There is potential for the release of concrete, and sediment laden water into the SAC via these groundwater pathways.

Mudflats and sandflats are associated with communities of invertebrates within the sediment. A degradation of water quality caused by pollution of watercourses from the Proposed Development has the potential to result in damage to these communities.

Atlantic salt marsh has been found to be impacted by changes in water quality. These changes are, however, associated with changes to vegetation structure caused by enrichment (Perrin *et al.*2020) as opposed to changes to pH associated with for example distant concrete run-off in surface / ground waters.

The potential for impacts to Mudflats and Sandflats associated with the Proposed Development have been identified. There is potential therefore, in the absence of mitigation, for impacts to QIs associated with Great Island Channel SAC caused by the Proposed Development during the construction phase.

Potential for Introduction/Spread of Invasive Species

Japanese knotweed has been recorded in a number of locations within the works area. While none have been recorded along watercourses with connectivity to the Great Island Channel SAC, there is potential for the presence of Japanese knotweed to occur at present or in the future in additional areas.

Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings with Japanese knotweed stands to result in the fragmentation of the Japanese knotweed into the river, and dispersal into the boundaries of the Great Island Channel SAC.

Himalayan balsam has been recorded upstream of Great Island Channel SAC. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is

potential for the works at the Owennacurra river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Great Island Channel SAC caused by the spread of invasive species during the construction phase.

3.3.2.2 Ballymacoda (Clonpriest and Pilmore) SAC

Direct Impacts to Habitats

The works are located outside of the European site boundary, and no habitats for which the site is designated (as outlined in section 3.3) have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts associated with the works.

Potential for Noise and Vibration Effects

There are no noise or vibration sensitive QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC.

Pollution Associated with Construction

Downstream hydrological connectivity has been identified to Ballymacoda (Clonpriest and Pilmore) SAC. There is potential for the release of concrete, and sediment laden water into the SAC via the watercourses identified.

Estuaries, and mudflats and sandflats are habitats closely associated with communities of invertebrates. A degradation of water quality caused by pollution of watercourses from the Proposed Development has the potential to result in damage to these communities.

Atlantic salt marsh and Salicornia mud have been found to be impacted by changes in water quality. These changes are, however, associated with changes to vegetation structures caused by enrichment (Perrin *et al.*2020) as opposed to changes pH.

The potential for impacts to estuaries and to mudflats and Sandflats associated with degradation in water quality caused by the Proposed Development have been identified. There is potential therefore, in the absence of mitigation, for impacts to QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC caused by the Proposed Development during the construction phase.

Invasive Species Introduction/Spread

Japanese knotweed has been recorded upstream within the works area (Dissour_020 river crossing). Multiple stands of Japanese knotweed have been identified upstream of Ballymacoda (Clonpriest and Pilmore) SAC, refer to Appendix B. There is potential for the presence of additional stands of knotweed to occur in areas that have not yet been surveyed due to Covid-19/access limitations. Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings to result in the fragmentation of the Japanese knotweed into the river.

Himalayan balsam has been recorded upstream within the works area. It is likely that additional stands of the species are present along the banks of watercourses within the Proposed Development footprint. Himalayan balsam has been found to disperse readily through

hydrochory (dispersal through water) (Love *et al.* 2013). There is potential for the works at river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments (Japanese knotweed) and/or seeds (Himalayan balsam) wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al.*, 2008; Hejda *et al.*, 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC caused by the spread of invasive species during the construction phase.

3.3.2.3 Blackwater River (Cork/Waterford) SAC

Direct Impacts to Qualifying Interests

The QIs for the Blackwater River (Cork/Waterford) SAC are described in section 3.3. As outlined previously, the works are located outside of the European site boundary, and no habitats for which the site is designated have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts to habitats associated with the works.

No otter signs, holts or couches were recorded within 150m of the works areas at the landfall, or at Ballyvergan Marsh where the footprint of the development is closest to the Blackwater River SAC. Otter signs were noted at river crossings along the cable route. Given the location of the works in relation to habitats likely to be used by otter, there is potential for holts or couches to become established prior to the construction phase of the works. As such, having regard to the precautionary principal, there is potential for direct impact to otters.

No other QIs have been identified as having potential to occur directly within the footprint of the development.

Potential for Noise and Vibration Effects

While no couches or holts were identified within 150m of the works areas, there is potential for holts or couches to become established prior to the construction phase of the works. There is also potential for otter to commute and forage in close proximity to the works. There is potential therefore for disturbance of otter associated with Blackwater River (Cork/Waterford) SAC.

Pollution Associated with Construction

Hydrological connectivity has been identified within the transitional waters of the SAC. There is potential for the release of concrete, and sediment laden water into these waterbodies. Given the nature of the watercourses, and their location in relation to the works, there is no potential for impact to habitats for which the site is designated caused by pollution or sedimentation caused by the construction of the Proposed Development.

Otter are likely to forage and commute within the coastal waters adjacent to the landfall location. As such, there is potential for pollution caused by the works to result in damage or death to food sources on which otter rely.

Twaite shad along with sea and potentially river lamprey associated with the SAC may occur within the coastal waters near to the landfall location. These species are highly susceptible to death or damage caused by pH changes associated with spills of cement fines into water.

There is potential, therefore, for impact to QIs associated with Blackwater River SAC caused by pollution/sedimentation caused by the Proposed Development.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Blackwater River (Cork/Waterford) SAC relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SAC.

3.3.2.4 Cork Harbour SPA

Direct Impact to Special Conservation Interests and Supporting Habitat

The works are located entirely outside of the European site boundary. However, the following SCIs associated with Cork Harbour SPA have been recorded within the ZoI to the Proposed Development (* in notable numbers):

- Black headed gull
- Common gull
- Cormorant
- Curlew (*)
- Dunlin
- Grey heron
- Lapwing (at Lough Aderry and Ballybutler pNHA only, based on desktop data)
- Lesser black-backed gull
- Oystercatcher(*)
- Red-breasted merganser
- Teal
- Wigeon (at Loughs Aderry and Ballybutler pNHA only, based on desktop data)

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Cork Harbour SPA caused by the Proposed Development during the construction phase as follows.

Pollution Associated with Construction

Deterioration in water quality associated with the works has, as outlined previously in relation to Great Island Channel SAC, the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. There is potential therefore, in the absence of mitigation, for impacts to SCIs associated with Cork Harbour SPA caused by the Proposed Development during the construction phase.

Potential for Noise and Vibration Effects

Eleven SCIs, as listed above, associated with Cork Harbour SPA have been recorded within the ZoI of the Proposed Development:

The Institute of Estuarine and Coastal Studies (2009) has reported on the differing sensitivity in terms of responses to disturbance stimuli, of different bird species. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has

the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the noise levels will be above 50dB within approximately 400m of the works, taking the most impulsive noisy works at the landfall as the worst-case scenario zone of impact.

There is potential therefore, in the absence of mitigation, for impacts to SCIs associated with Cork Harbour SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance SCI Birds

No direct visual disturbance will arise to SCI birds within the SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. that can be considered *ex situ* site[20] of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is considered that given that roosting and foraging SCI birds have extensive alternative habitat at Claycastle and that habitats will be fully reinstated with existing materials; imperceptible impacts will arise in the absence of mitigation. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Potential for Spread of Invasive Species

Japanese knotweed has been recorded in a number of locations within the works area. While none have been recorded along watercourses with connectivity to the Cork Harbour SPA, there is potential for the presence of knotweed to occur in additional areas given survey constraints.

Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings with Japanese knotweed stands to result in the fragmentation of the Japanese knotweed into the river, and dispersal into the boundaries of the Cork Harbour SPA.

Himalayan balsam has been recorded upstream of Cork Harbour SPA. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is potential for the works at the Owennacurra river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to SCIs associated with Cork Harbour SPA caused by the spread of invasive species during the construction phase.

[20] One definition of an ex-situ, arising from Irish Case Law is a habitat situated in the immediate hinterland of the SPA or ecologically connected to it, which may at times be used by some water bird species. [2020] IEHC 400
[2018 No. 880 J.R.]https://www.courts.ie/acc/alfresco/91c7ad61-f9fb-4884-8677-53276fc1510f/2020_IEHC_400.docx/docx/1

3.3.2.5 Ballymacoda Bay SPA

The works are located entirely outside of the European site boundary. However, the following SCIs associated with Ballymacoda SPA have been recorded within the ZoI of the Proposed Development (* in notable numbers; ** in numbers exceeding figure of national significance):

- Black-headed gull
- Common gull
- Curlew (*)
- Dunlin
- Lapwing (only at Loughs Aderry and Ballybutler pNHA, based on desktop data)
- Lesser black backed gull
- Ringed plover(*)
- Sanderling(**)
- Teal
- Wigeon (only at Loughs Aderry and Ballybutler pNHA, based on desktop data)

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Ballymacoda Bay SPA caused by the Proposed Development during the construction phase as follows.

Pollution Associated with Construction

Deterioration in water quality associated with the works has, as outlined previously in relation to Ballymacoda (Clonpriest and Pilmore) SAC, the potential to result in a degradation of estuaries, and mudflats and sandflats habitats associated with the SPA. These habitats comprise key foraging habitat for a large number of birds associated with the SPA. There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Ballymacoda Bay SPA caused by the Proposed Development during the construction phase.

Potential for Noise and Vibration Effects

As outlined above, twelve SCIs associated with Ballymacoda Bay SPA have been recorded in proximity to the Proposed Development:

The Institute of Estuarine and Coastal Studies (2009) has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the majority of the noise impacts associated with piling will be within the carpark and the caravan park. Noise levels will be above 50dB within approximately 400m of these works. There is potential also for noise impulses associated with breaking out of hard standing along the existing roadway which runs along the edge of Ballyvergan Marsh. There is potential therefore, in the absence of mitigation, for disturbance impacts to SCIs associated with Ballymacoda Bay SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance to SCI Birds

No direct visual disturbance will arise to SCI birds when using this SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. can be considered *ex situ* site of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Invasive Species Spread

Japanese knotweed has been recorded upstream within the works area. Multiple stands of Japanese knotweed have been identified upstream of Ballymacoda Bay SPA. There is potential for the presence of additional stands of knotweed to occur in areas that have not yet been surveys. Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at the watercourse crossing to result in the fragmentation of the Japanese knotweed into the river.

Himalayan balsam has been recorded upstream within the works area. It is likely that additional stands of the species are present along the banks of watercourses within the Proposed Development footprint. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is potential for the works at river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

Japanese knotweed has also been recorded at Ballyvergan Marsh, there is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* habitat for wintering SCIs

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Ballymacoda Bay SPA caused by the spread of invasive species during the construction phase

3.3.2.6 Blackwater Estuary SPA

The works are located entirely outside of the European site boundary. However. the following SCIs associated with Blackwater Estuary SPA have been recorded within the ZoI (* in notable numbers):

- Curlew (*)
- Dunlin
- Lapwing (at Lough Aderry and Ballybutler pNHA only, based on desktop data)
- Teal,
- Wigeon (at Lough Aderry and Ballybutler pNHA only, based on desktop data)

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Blackwater Estuary Bay SPA caused by the Proposed Development during the construction phase as follows.

Pollution/Sedimentation Associated with Construction

As discussed for Blackwater River (Cork/Waterford) SAC hydrological connectivity to the designated sites has been identified only through transitional waters. There is potential for the release of concrete, and sediment laden water into these waterbodies. Given the nature of the watercourses, and their location in relation to the works, there is no potential for impact to habitats for which the site is designated caused by pollution or sedimentation caused by the construction of the Proposed Development.

As such, there is no potential for indirect degradation of wetland habitats within the European site boundary.

Potential for Noise and Vibration Effects

As outlined above, seven SCIs associated with Blackwater Estuary SPA have been recorded in proximity to the Proposed Development:

The Institute of Estuarine and Coastal Studies (2A009) has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the majority of the noise impacts associated with piling will be within the carpark and the caravan park. Noise levels will be above 50dB within approximately 380m of these works. There is potential also for noise impulses associated with breaking out of hard standing along the existing roadway which runs along the edge of Ballyvergan Marsh. There is potential therefore, in the absence of mitigation, for disturbance impacts to SCIs associated with Blackwater Estuary SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance SCI Birds

No direct visual disturbance will arise to SCI birds when using this SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. can be considered *ex situ* site of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is considered that given that roosting and foraging SCI birds have extensive alternative habitat at Claycastle and that habitats will be fully reinstated with existing materials; imperceptible impacts will arise in the absence of mitigation. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Blackwater Estuary SPA relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SPA.

Japanese knotweed has also been recorded at Ballyvergan Marsh, there is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* habitat for wintering SCIs

3.3.2.7 Mullaghanish to Musheramore Mountains SPA

Direct Impact to Special Conservation Interests and Supporting Habitat

The works are located entirely outside of the European site boundary. However, wintering hen harrier have been recorded at Ballyvergan marsh in proximity to the Proposed Development. The wintering bird surveys carried out for the Ballyvergan marsh recorded the roosts at their closest point 700m from the works areas. As such, there is no potential for direct impact to wintering hen harrier and their winter roosts. Indirect pollution and noise impacts are discussed hereunder.

Pollution/Sedimentation Associated with Construction

As discussed previously, Mullaghanish to Musheramore Mountains SPA is located a significant distance from the Proposed Development at 45km to the north. Given the location in relation to the Proposed Development, there is no potential for impact to habitats within the SPA boundary caused by the Proposed Development.

Given the absence of direct connectivity (e.g. via ditches or watercourses) between the Proposed Development and the roost site (min. 720 m distant), there is no potential for degradation of roosting habitat caused by surface water emissions associated with the proposed works.

Potential for Noise and Vibration Effects

As outlined above, wintering hen harrier potentially associated with Mullaghanish to Musheramore Mountains SPA have been recorded in proximity to the Proposed Development. Displacement of hen harrier from their winter roost has the potential to result in a loss of reproductive fitness for impacted individuals, upon return to the distant breeding grounds within the SPA.

Little information is available in relation to disturbance responses in wintering hen harrier. In breeding hen harrier, a safe working distance buffer of between 500m and 1000m is recommended (Petty 1998, Romin & Muck 1999; Currie & Elliot 1997, Whitfield et al., 2008). As such, having regard to the precautionary principle, the buffer for disturbance to wintering hen harrier specifically when they arrive into roost areas is taken as 1000m.

There is potential therefore, in the absence of mitigation, for noise disturbance impacts to hen harrier associated with Mullaghnish to Musheramore Mountains SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance

No direct visual disturbance will arise to SCI birds when using this SPA or other SPA utilised by breeding Hen Harrier. Roosting hen harrier regularly use Ballyvergan Marsh during the winter as a roost site and it is an important *ex situ* site for Hen Harrier including individuals that likely breed on SPA sites. Hen harrier are sensitive to disturbance particularly when they return at dusk to roost. Hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is noted that given that while recorded roost areas are typically > 700m from proposed works areas, precautionary mitigation is required to avoid possible temporary disturbance/ displacement impacts during construction works, specifically within Ballyvergan Marsh.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Mullaghanish to Musheramore Mountains SPA relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SPA.

Japanese knotweed has also been recorded at Ballyvergan Marsh, the habitat in which the hen harrier is roosting and likely foraging. There is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* supporting habitat for wintering SCIs.

3.3.3 Effect Pathways during Operation

Routine maintenance for the works will be restricted to works at the proposed Converter Station, the joint bays along the cable route, and the landfall area. The maintenance regime for the connection within Knockraha substation will be the responsibility of ESBN.

3.3.3.1 Special Areas of Conservation

There is no potential for likely significant effects to SACs, because:

- (In contrast to SPAs), There are no mobile QIs of relevant SACs within the ZoI of the proposed development;
- Joint bays have removable lids and maintenance works will not result in the breaking of ground and/or generate significant volumes of water-borne silt, concrete washings or other pollutants; and,
- Invasive species within the footprint and on roadsides will have been removed or will be under ongoing treatment by EirGrid and/or the local authority.

3.3.3.2 Special Protection Areas

Maintenance Works at Converter Station Site

There is no potential for routine maintenance works at the proposed Converter Station to significantly affect European sites because:

- The operational drainage network, including SUDS and Class 1 interceptor to treat surface water prior to discharge (and eventual outfall to Cork Harbour SPA/Great Island Channel SAC) will be operating; and
- Invasive species within the footprint and on roadsides will have been removed, or will be under ongoing treatment by EirGrid and/or the local authority.
- Maintenance will be within the fence line of the Converter Station; but SCI teal of Cork Harbour and Ballymacoda Bay SPAs are confined to the pond on the western perimeter of the wider Ballyadam/IDA site outside the ZoI of disturbance from human disturbance. SCI gull species occur sporadically and in small numbers, and as generalist species (often feeding in urban areas), can tolerate greater levels of human disturbance than waterfowl such as teal.

Maintenance Works Along HVAC Cable Route

There is no risk to European sites from maintenance works along the HVAC route, which is inland, and along which there are no known ex-situ sites for mobile SCI or QI species.

Maintenance Works Along HVDC Cable Route

Routine Maintenance

There is potential for maintenance works along the HVDC cable route to result in SCI bird disturbance if carried out during the non-breeding season (September to March inclusive), potentially resulting in significant effects to:

- Wintering SCI birds of Ballymacoda, Cork Harbour, and Blackwater Estuary SPAs, at any time of day or night; and/or
- Wintering SCI hen harrier of Mullaghanish to Musheramore Mountains SPA, where works proceed at early morning or late afternoon between November and March inclusive.

This has been identified at only two locations as follows:

- A joint bay within Ballyvergan Marsh, and potential for disturbance to non-breeding SCI curlew, teal, and hen harrier: and,
- The TJB at Claycastle beach.

The roadways around the marsh are screened by existing hedgerows, and (in contrast to construction works) are not likely to result in bird disturbance.

Non-Routine Maintenance

EirGrid's Planning and Environmental Unit screen all non-routine works for Appropriate Assessment, and planning requirements; and EirGrid will obtain all relevant consents where required. As such, there is no likelihood for significant effects.

3.3.4 Summary

The Proposed Development has the potential to result in the following impacts at the construction phase of the works, as outlined below in Table 3.15

Table 3.17: Potential for Impact in the Absence of Mitigation Identified

European site	Construction-Phase Impacts	Operation-Phase Impacts
Great Island Channel SAC	Potential for degradation of Mudflats and sandflats caused by pollution of watercourses	None
	Potential for degradation of Atlantic salt marsh due to invasive species spread	
Ballymacoda (Clonpriest and Pilmore) SAC	Potential for degradation of Estuaries caused by pollution of watercourses	None
	Potential for degradation of Mudflats and sandflats caused by pollution of watercourses	
	Potential for degradation of Atlantic salt marsh due to invasive species spread	
Blackwater River (Cork/Waterford) SAC	Potential for impacts to couches and holts (if present due to establishment prior to the construction phase of the works commencing)	None
	Potential for noise disturbance to otter	
	Potential for impacts to food sources for otter caused by pollution of watercourses	
	Potential for impacts to twaite shad caused by pollution of coastal waters	
	Potential for impacts to sea and river lamprey caused by pollution of coastal waters	
Cork Harbour SPA	Potential for direct impact to *ex situ* supporting habitat SCI species	Potential for noise and visual disturbance to the following SCI populations within ZoI: black headed gull, common gull, cormorant, curlew, grey heron, lesser black-backed gull, oystercatcher, red-breasted merganser, teal [Populations at Loughs Aderry and Ballybutler not affected due to joint bay locations]
	Degradation of wetland habitat within the SPA boundary caused by pollution	
	Potential for noise and visual disturbance to SCI populations of the following species within ZoI: black headed gull, common gull, cormorant, curlew, dunlin, grey heron, lapwing, lesser black-backed gull, oystercatcher, red-breasted merganser, teal, wigeon	
	Degradation of supporting habitat caused by invasive species spread	
Ballymacoda Bay SPA	Potential for direct impact to *ex situ* supporting habitat of SCI species	Noise and visual disturbance impacts to the following SCI populations within ZoI:

European site	Construction-Phase Impacts	Operation-Phase Impacts
	Deterioration in supporting habitat within the European site boundary due to water quality impacts	black-headed gull, common gull, curlew, lesser black backed gull, ringed plover, sanderling, teal [Populations at Loughs Aderry and Ballybutler not affected due to joint bay locations]
	Noise and visual disturbance impacts to SCI populations within ZoI: black-headed gull, common gull, curlew dunlin, lapwing, lesser black backed gull, ringed plover, sanderling, teal, wigeon	
	Degradation of supporting habitat for SCIs caused by invasive species spread	
Blackwater Estuary SPA	Potential for direct impact to *ex situ* supporting habitat SCI species	Noise and visual disturbance to, curlew, dunlin, teal [Populations at Loughs Aderry and Ballybutler not affected due to joint bay locations]
	Noise and visual disturbance to, curlew, lapwing, teal, wigeon	
Mullaghanish to Musheramore Mountains SPA	Noise and visual disturbance to wintering hen harrier	Noise and visual disturbance to wintering hen harrier
	No direct impact. Degradation of supporting habitat for SCIs caused by invasive species spread	

3.3.5 Plans and Projects which Might Act In-combination

Article 6(3) of the Habitats Directive requires that:

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.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects. A search of planning applications in the vicinity of the works was undertaken in December 2020 to examine projects with potential for in combination effects.

Celtic Interconnector Project below High Water Mark

As previously noted, this AA Screening Report and NIS assesses the effects on European sites of the Irish land-based elements of the Proposed Development (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Irish elements offshore, elements in the UK Exclusive Economic Zone, and French elements of the Project.

A separate AA Screening Report and NIS has been drafted for the (Irish) Offshore elements of the works ('the Irish offshore NIS'). The Irish offshore NIS could not exclude the potential for likely significant effects on the Ballymacoda Bay SPA and the Blackwater Estuary SPA. However following mitigation the Irish offshore NIS concluded there would be no adverse effects on the integrity of any European sites, either alone or in combination with other plans or projects (including the Proposed Development).

Piling below the high water mark, to install sheet pilling at the landfall, is not part of the proposed development, but will result in increased noise and vibration levels in areas overlapping the proposed development, including the upper Claycastle beach, and Ballyvergan Marsh.

British Standards (2014) 'Code of construction practice for noise and vibration control on construction and open sites – Part 2: Vibration' (The Standards) provides a summary of historic case data on vibration levels measured during piling for a range of soil conditions and pile dimensions. The Standards outline the peak particle velocity (PPV) in mm/s at a set of distances [m] and conclude that typical levels are unlikely to exceed 1mm/s at distances above 16m. The predicted level of vibration due to vibratory sheet piling falls below 1mm/s at a distance of approximately 55m.

Further, assuming a worst-case, where works associated with the cable route up to the high water mark take place (at least during a period of time) concurrently to the works at the landfall location, there is potential for an in-combination effect on Ballymacoda Bay SPA and the Blackwater Estuary SPA resulting in increased noise emissions.

A Habitats Regulations Assessment (HRA) Screening assessment was produced for the UK (offshore) elements of the Project. This concluded that the potential for likely significant effects on the conservation objectives on European sites designated by the UK could be excluded for the Celtic Interconnector Project alone and in-combination with other plans and projects.

For the French elements of the Project, reporting to fulfil Article 6(3) of the Habitats Directive comprises a report (in French) entitled: 'Évaluation Des Incidences Natura 2000'. This report did not identify potential for likely significant effects on any European sites within the Irish jurisdiction, and concluded there would be no adverse effects on the integrity of any European sites, from the French elements of the Project alone, in combination with other plans or projects (including the Proposed Development).

3.3.5.1 Plans

Cork County Development Plan 2014

The Proposed Development is located within the Cork County administrative area. The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by an Appropriate Assessment which was undertaken to ensure that any likely effects of the plans' policies were considered in order to avoid any such adverse impacts.

The Natura Impact Report outlines European sites which were subject to policy requirements to maintain/restore site integrity. A summary of this assessment is provided in Table 3.18 in relation to European sites identified as within the ZoI for the Proposed Development.

Table 3.18: County Development Plan Policy Requirements

European site Name	CDP Screening Conclusion	Policy Requirements Identified in the CDP to Maintain/Restore Site Integrity
Great Island Channel SAC	Potential for impacts identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones within Cork Harbour; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Protect estuarine habitats from risk of toxic contamination arising from industrial and port related activities common in the harbour area.
Ballymacoda (Clonpriest and Pillmore) SAC	Not identified as having potential to be impacted by the CDP. The site was screened out at the draft development plan stage	• Maintain or restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area • Prevent direct loss of estuarine habitats within the SAC • Prevent drainage of wetland habitats • Prevent contamination or deterioration of estuarine habitats
Blackwater River (Cork/Waterford) SAC	Potential for significant impacts to arise relating in particular to Core Strategy, Wind Energy Strategy, and provision of roads infrastructure.	• Restore a high standard of water of water quality in surface waters in SAC; • Maintain open channels to allow the free passage of fish in freshwater habitats; • Maintain stable hydrological regime in surface waters in SAC; • Prevent direct loss of freshwater habitats within SAC; • Prevent drainage of wetland habitats; • Prevent contamination or other deterioration of freshwater habitats in SAC; • Prevent disturbance to otter and otter habitat.
Cork Harbour SPA	Potential for impacts Identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Prevent disturbance to wintering birds; • Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Prevent contamination or deterioration of estuarine habitats.
Ballymacoda Bay SPA	Not identified as having potential to be impacted by the CDP.	
Blackwater Estuary SPA	Potential impacts identified relating to inadequate treatment of wastewater and tourism policies.	
Mullaghanish to Musheramore Mountains SPA	No potential impacts specified but amendments recommended to draft plan re wind energy policy and provision of wastewater infrastructure	• Prevent disturbance to breeding birds; • Protect feeding and breeding habitat of hen harrier

Existing legislative requirements, and the Council's policies and objectives will ensure that all plans and projects proposed within the county are subjected to screening for AA, and if required AA. This will assess the potential for likely significant effects to European sites, and where deemed necessary, the potential for an adverse effect on European site integrity, either alone or in combination with other plans and projects.

3.3.5.2 Current Projects

Midleton to Youghal Greenway

The project comprises a Greenway route which runs from the north-eastern corner of Midleton to the old railway station at Youghal in east Cork. As part of the application an Appropriate Assessment Screening report was prepared.

The AA screening report for the greenway concluded that:

"*Based on the best available scientific information, construction and operation of the proposed Greenway between Midleton and Youghal, Co. Cork, poses no risk of likely significant effects on Natura 2000 sites (e.g. Great Island Channels SAC, Cork Harbour SPA, Ballymacoda (Clonpriest and Pillmore) SAC or Ballymacoda Bay SPA)*."

Construction works for the greenway are currently progressing. The timing of the works is such that the greenway will be constructed prior to the commencement of the construction phase of this Proposed Development. No potential for in-combination impacts during construction have been identified.

Operational maintenance requirements for the Proposed Development, may require access to a joint bay within the Ballyvergan marsh, located c. 50 m from the greenway at its nearest point. However, given the infrequent and short term nature of this maintenance, no operational risks to Hen Harrier are identified.

The Ecology Report for the greenway[21] states "the proposed greenway is not to be lit and thus is not intended for night-time usage. As the marsh is used as a night-time roost operational impacts from disturbance are unlikely".

Lower Lee Flood Relief Scheme

The OPW in conjunction with Cork County Council are advancing the Lower Lee (Cork City) Flood Relief Scheme. The scheme will run from Inniscarra Dam to the City Centre. A report for the Screening of Appropriate Assessment was developed for the scheme. Among other European sites, the report examined the potential for likely significant effects on the Cork harbour SPA, and the Great Island Channel SAC.

The report concluded that "*The evaluation undertaken has identified that there will be no potential significant impact on any Special Conservation Interests and their conservation objectives, either alone or in-combination with any other plans and projects, for European sites given their distance either downstream or upstream of the proposed works and due to the operational proposals for the scheme.*"

Given the location of the flood relief scheme in relation to the Proposed Development, more than 10km to the west, and that no potential for significant impact was identified on any European sites, no potential for in-combination impacts is identified.

[21] https://www.corkcoco.ie/sites/default/files/2018-09/Ecology%20Report.pdf

3.3.5.3 Future Projects

Midleton Carrigtwohill WWTP upgrades

Irish Water (IW) has a growth project to construct new wastewater infrastructure (pump stations and network) to connect Midleton and Carrigtwohill WWTPs by Q4 2023. The proposed (IW) route is between Carrigrenan road and the Ballyadam bridge area and will overlap the proposed Celtic Interconnector cable route.

Following the design of the proposed WWTP upgrades, the final design and the project for the upgrade of the Midleton and Carrigtwohill WWTPs will be subject themselves to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment (and if necessary, AA).

N25 Carrigtwohill to Midleton Scheme

The Cork Roads Design Office (RDO) in liaison with Transport Infrastructure Ireland (TII) are currently planning the upgrading of the part of the existing N25 between Carrigtwohill and Midleton, including that portion which adjoins the proposed Converter Station site. This road project will involve the expansion of the existing road corridor to dual carriageway. A number of potential options affecting the wider IDA landholding at Ballyadam are currently being considered by the RDO, including the provision of a full dumb-bell interchange at Ballyadam, with associated slip roads, on the southern portion of the overall landholding. There is potential for an overlap in construction for the period of 2025-2026. There may be the potential for surface water emissions associated with the works, which has potential to cause impacts to Cork Harbour SPA.

Following the design of the scheme and selection of the preferred option, the Carrigtwohill to Midleton Scheme will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment (and if necessary, AA).

Midleton Flood Relief Scheme

The flood relief scheme for Midleton is currently under development. There is potential for the scheme's construction to run concurrently with the construction for the Project. There is the potential for surface water impacts associated with the flood scheme which is in proximity to Great Island Channel SAC and Cork Harbour SPA. .

Following the design of the scheme and selection of the preferred option, the Midleton Flood Relief Scheme will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment.

Ballyadam 110kV Substation

The Electricity Supply Board (ESB) propose to construct a new 110kV substation to the east of the proposed Converter Station compound. These works may require additional site clearance within the wider IDA site, and may result in additional surface water impacts. Given that the project has not yet been defined at the time of writing, the extent of this potential is unclear.

Following the design of substation, the project will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment.

IDA lands at Ballyadam

Although there were no definitive projects or plans at the time of writing this EIAR it is possible that other developments within the wider Ballyadam site will be developed and that these may have potential for in-combination effects. The IDA are also likely to develop internal access roads and utility connections for the wider Ballyadam site.

As the nature of these projects and plans are not known the associated in-combination impacts cannot be assessed. However, it is likely that the plans will require additional site clearance within the wider IDA site, an, in the absence of mitigation, may result in in-combination surface water and/or SCI bird disturbance .

Urban Expansion Project

The urban expansion of the area to the northwest of the Converter Station site is planned to facilitate housing development. As well as residential development, the proposals will include cycling/pedestrian facilities, a new school campus and road upgrades.

In the absence of coordination between the Contractor constructing the proposed Converter Station, developers of the urban expansion project, and Cork County Council, there is the potential for in-combination surface water and/or SCI bird disturbance impacts to arise.

Kilbarry Knockraha 110 kV Refurbishment

Renewal and refurbishment of the Kilbarry-Knockraha 110 kV overhead transmission line.

The majority of the works associated with this project will be carried out outside the ZoI of the Proposed Development. The AA Screening Reports for the Kilbarry Knockraha 110 kV Refurbishments produced on behalf of EirGrid (MKO, 2020 a, b) (to Cork City Council and Cork County Council respectively) both concluded there would be no likely significant effects to European sites.

Inis Ealga Marine Energy Park

This project relates to an offshore floating wind energy project off the coast of Cork which is at an early optioneering stage of development. There is an intersection between the submarine cable route of the Celtic Interconnector and the indicative installation corridor identified for the Inis Ealga Marine Park.

No indicative timeframe is available to determine whether works will run in parallel to the construction phase of the Celtic Interconnector project.

The onshore transmission connection proposals are not yet available. Following the design of substation, the project will be subject to the provisions of the Directive in its own right, i.e. requiring screening for Appropriate Assessment.

In-Combination Effects

Cork Harbour SPA and Great Island SAC

The conservation objectives supporting document for Cork harbour SPA (NPWS 2014e) notes the following historic activities which have caused habitat loss and degradation in habitats associated with Cork harbour SPA and Great Islands SAC:

- Loss of habitat associated with the Dunkettle roundabout
- Reclamation of land at Marino point, Rushbrooke, brown Island, Long Point, Adhada, and Ringaskiddy
- Construction of the Slatty Bridge Sluice cutting off intertidal zone and some salt marsh habitat
- The expansion of towns and villages which has required an expanding road network with many roads being built on the edges or across intertidal mudflats (Smiddy et al. 1995) with resulting habitat loss.
- General development of nearby farmland
- Grazing in salt marsh habitats

The Proposed Development does not require any land take, reclamation or change of use of any lands within any European sites. However, the degradation of wetland habitats associated with the construction phase of the works has the potential to result in in-combination effects on Great Island SAC and Cork Harbour SPA in the absence of mitigation.

It is noted that Cork Harbour has a history of problems which are caused by water pollution and eutrophication (NPWS 2014e). This is caused by enrichment of the coastal waters caused by Wastewater discharge. The Proposed Development requires welfare facilities at the Converter Station. However, the station would be unmanned and the welfare facilities are only likely to be used sporadically during maintenance. The discharge associated with the proposed Converter Station will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values.

As such, there is no potential for in-combination impacts associated with enrichment of coastal waters within Cork Harbour SPA and Great Island SAC.

Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC

The conservation objectives supporting document for Ballymacoda Bay SPA (NPWS 2014f) notes the following historic activities which have caused habitat loss and degradation in habitats associated with Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC.

- Reclamation of land adjacent to the estuary in general is noted as causing significant alterations to saltmarsh habitat within the site (McCorry & Ryle, 2009). It is thought that these changes may have contributed to alterations in the shoreline profile of the estuary within the past 150 years as well as changes in sediment deposition, accretion, and saltmarsh growth.
- The installation of sluices on rivers flowing into the estuary has meant that the tidal influences of these rivers has been reduced.
- The alien invasive species common cordgrass (*Spartina sp.*) has caused degradation of habitats and the loss of mudflat habitat within the site.

The Proposed Development does not require any land take, reclamation or change of use of any lands within any European sites. However, the potential for degradation of wetland habitats associated with the construction phase of the works (in the absence of mitigation) has been identified. As such there is potential to result in in-combination effects on Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC in the absence of mitigation.

Water in the Ballymacoda Estuary is noted as being subject to enrichment (NPWS 2014f). Sources of this enrichment are thought to be associated with discharge of nutrients from agricultural activities, septic tanks and wastewater discharges. The Proposed Development requires welfare facilitates at the Converter Station. However, no downstream hydrological connectivity was identified between the Converter Station site and Ballymacoda bay. The extents of the Proposed Development with connectivity to the site is comprised of the cable route. As such, there is no potential for in-combination effects caused by enrichment associated with the proposed works.

Blackwater Estuary SPA and Blackwater River SAC

The conservation objectives supporting document for Blackwater Estuary SPA (NPWS 2014g) notes the following historic activities which have caused habitat loss and degradation in habitats associated Blackwater Estuary SPA and Blackwater River SAC.

- North of Youghal an area of mudflat was reclaimed in the 19th century
- Foxhole, and the southern bank of the Tourig estuary were reclaimed historically however it is noted that some of these areas have reverted to natural habitat
- The Youghal by-pass (N25) road scheme is noted as dissecting some wetland habitat.

No potential for impacts to habitats associated with Blackwater Estuary SPA and Blackwater River SAC were identified. As such, there is no potential for in-combination effects associated with the Proposed Development. Likewise, although water quality within the designated sites are noted as being at risk, no potential for impacts causing a degradation of water quality with these European sites was identified. As such, there is no potential for in-combination effects identified in relation to either Blackwater Estuary SPA or Blackwater River (Cork/Waterford) SAC.

3.4 Potential for Adverse Effects on Site Integrity

3.4.1 Potential for Adverse Effects on Great Island Channel SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Great Island Channel SAC due to indirect impacts associated with the construction phase of the Proposed Development as follows:

- Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses and karstic conduits
- Potential for degradation of Atlantic salt marsh due to invasive species

Site Specific Conservation Objectives have been developed for Great Island Channel SAC. These have been listed in section 3.2. An assessment of the potential for adverse effects on the integrity of the Great Island Channel SAC, in the absence of mitigation, is presented hereunder in the tables below.

.

Table 3.19: Assessment of Potential for Adverse Effects on the site Integrity (before mitigation) of Great Island Channel SAC – Mudflats and sandflats not covered by seawater at low tide

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas of mudflat. There will be no direct loss of tidal mudflats and sandflats associated with the works. There is potential for surface water pollution to enter into the habitat. However, given that there will be no changes to the hydrological process which govern the sediment processes within the SAC there will be no alteration to the extent of tidal mudflats and sand flats within the SAC	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex	The potential for pollution of watercourses with downstream connectivity has been identified. Further, the potential for release of concrete into the waters of Great Island Channel through underground conduits associated with the Converter Station. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on the site's integrity**.

Table 3.20: Assessment of Potential for Adverse Effects on the site Integrity of Great Island Channel SAC – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatwohil - 1.01ha. See map 5	The is located a significant distance from the nearest extent of salt marsh. There will be no loss of salt meadow habitat area associated with the development .	No potential for adverse effects on site integrity have been identified.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	The is located a significant distance from the nearest extent of salt marsh. There will be no decline or change in habitat distribution associated with the development.	No potential for adverse effects on site integrity have been identified.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The is located a significant distance from the nearest extent of salt marsh. There are no physical barriers that might alter the natural circulation of sediments and organic matter associated with the development.	No potential for adverse effects on site integrity have been identified.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	The is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the physical structure of the salt marsh.	No potential for adverse effects on site integrity have been identified.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	The is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the natural tidal regime caused by the development.	No potential for adverse effects on site integrity have been identified.
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the zonation within the salt meadow habitat.	Impacts on the vegetation structure would constitute an **adverse effect on site's integrity**.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions,	Impacts on the structural variation would constitute an **adverse**

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
			there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the vegetation structure within the salt meadows. Where stands of Japanese knotweed and Himalayan balsam occur, there is potential for a loss of structural variation within the swards.	**effect on site's integrity**.
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. Where stands become established and die back during winter there is the potential for erosion of ground and a subsequent increase in bare earth associated.	Impacts on the vegetation cover would constitute an **adverse effect on site's integrity**.
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. As these species become established there is the potential for the vegetation composition to become altered, and a loss of typical species which are associated with Salt marsh.	Impacts on the vegetation communities would constitute an **adverse effect on site's integrity.**
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is known to occur	Common cordgrass has not been identified within the footprint of the Proposed Development. Given the nature of the habitats within the footprint of the there is no potential for the introduction or expansion of common cordgrass as a result of the works.	No potential for adverse effects on site integrity have been identified.

3.4.2 Potential for Adverse Effects on Ballymacoda (Clonpriest and Pilmore) SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Ballymacoda (Clonpriest and Pilmore) SAC due to indirect impacts associated with the construction phase of the Proposed Development as follows:

- Potential for degradation of Estuaries caused by pollution of watercourses
- Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses
- Potential for degradation of Atlantic salt marsh due to invasive species spread

Site Specific Conservation Objectives have been developed for Ballymacoda (Clonpriest and Pilmore) SAC. These have been listed in section 3.2. An assessment of the potential for adverse effects on the integrity of the Ballymacoda (Clonpriest and Pilmore) SAC, in the absence of mitigation, is presented hereunder in the tables below.

Table 3.21: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Estuaries

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity without mitigation
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas that correspond to the Estuaries habitat. There will be no direct loss of estuary habitat associated with the works.	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community types in a natural condition: Sandy mud with *Hediste diversicolor* and *Tubificoides benedii* community; Sand with polychaetes and bivalves community complex.	The potential for pollution of watercourses with downstream connectivity has been identified Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on site's integrity i**n the absence of mitigation.

Table 3.22: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Mudflats and sandflats not covered by seawater at low tide

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas of mudflat. There will be no direct loss of tidal mudflats and sandflats associated with the works. There is potential for surface water pollution to enter into the habitat. However, given that there will be no changes to the hydrological process which govern the sediment processes within the SAC there will be no alteration to the extent of tidal mudflats and sand flats within the SAC	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community types in a natural condition: Sandy mud with Hediste diversicolor and *Tubificoides benedii community*; Sand with polychaetes and bivalves community complex	The potential for pollution of watercourses with downstream connectivity has been identified. Further, the potential for release of concrete into the waters of Great Island Channel through underground conduits associated with the Converter Station. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on site's integrity**.

Table 3.23: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: For sub-sites mapped: Ballymacoda- 1.57ha.	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no loss of salt meadow habitat area associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no decline or change in habitat distribution associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There are no physical barriers that might alter the natural circulation of sediments and organic matter associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the physical structure of the salt marsh.	No potential for adverse effects on site integrity have been identified.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the natural tidal regime caused by the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the zonation within the salt meadow habitat.	Impacts on the vegetation structure would constitute an **adverse effect on site's integrity i**n the absence of mitigation.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at	Impacts on the structural variation would constitute an **adverse effect on site's integrity i**n the absence of mitigation.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
			the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the vegetation structure within the salt meadows. Where stands of Japanese knotweed and Himalayan balsam occur, there is potential for a loss of structural variation within the swards.	
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. Where stands become established and die back during winter there is the potential for erosion of ground and a subsequent increase in bare earth associated.	Impacts on the vegetation cover would constitute a **negative effect on site's integrity**.
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. As these species become established there is the potential for the vegetation composition to become altered, and a loss of typical species which are associated with Salt marsh.	Impacts on the vegetation communities would constitute an **adverse effect on site's integrity i**n the absence of mitigation.
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Common cordgrass has not been identified within the footprint of the Proposed Development. Given the nature of the habitats within the footprint of the Proposed Development there is no potential for the introduction or expansion of common cordgrass as a result of the works.	No potential for adverse effects on site integrity have been identified.

3.4.3 Potential for Adverse Effects on Blackwater River (Cork/Waterford) SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Blackwater River (Cork/Waterford) SAC due to impacts associated with the construction phase of the Proposed Development as follows:

- Potential for impacts to couches and holts (if present, having become established prior to the construction phase of the works commencing).
- Potential for noise disturbance to otter
- Potential for impacts to food sources for otter caused by pollution of watercourses
- Potential for impacts to twaite shad caused by pollution of coastal waters
- Potential for impacts to river lamprey and sea lamprey caused by pollution of coastal waters

Site Specific Conservation Objectives have been developed for Blackwater River (Cork/Waterford) SAC. These have been listed in section 3.2. An assessment of the potential for adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC, in the absence of mitigation, is presented hereunder in the tables below.

Table 3.24: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Otter (*Lutra lutra*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution	Percentage positive survey sites	No significant decline	The works are largely restricted to within the road curtilage and agricultural fields. No otter holts or couches were recorded during field walkovers including river crossings. Signs of otter presence were noted in particular at river crossings. There is potential, given the habitats within Ballyvergan Marsh and along water crossings, for holts and couches to become established prior to construction of the Proposed Development. There is also potential for otters to forage and commute in the vicinity of the works areas. As such, there is potential for the works to cause disturbance resulting in the avoidance of the Proposed Development by otter. As such this may, in a worst-case scenario, result in a reduction in the percentage of positive survey sites for otters associated with Blackwater River (Cork/Waterford) SAC. However, given that these areas are not located within the boundary of the European site and well outside typical home ranges of individual Otter in this SAC, it will not result in a significant decline in the percentage of positive survey sites within the SAC.	No potential for adverse effects on site integrity have been identified.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along riverbanks/ around ponds	The Proposed Development is predominantly comprised of an underground cable. The exception to this is the landfall site and the converter station. The location of the converter station, and the habitats recorded therein, are such that the territories of otters associated with the Blackwater River (Cork/Waterford) SAC will not be impacted. The landfall site will require a construction adjacent to the carpark at Claycastle. This area does not, however constitute terrestrial habitat as mapped by the Conservation Objectives for Blackwater River (Cork/Waterford) SAC. Further, as the structures are belowground and will be reinstated, this does not constitute a significant decline in the habitat available to otters.	No potential for adverse effects on site integrity have been identified.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 647.2ha	The cable where it occurs within the marine habitat is buried. There is no potential for loss of marine habitat for otter as a result of the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 599.54km	The cable where it crosses freshwater habitat is below ground. There may be a short term restriction from these areas during construction. These will not, however be permanent and will not result in a significant decline of freshwater habitat for otter.	No potential for adverse effects on site integrity have been identified.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 25.06ha	No works are required within any lakes. There is no potential for any loss of lake habitat for otters as a result of the Proposed Development.	No potential for adverse effects on site integrity have been identified.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Couching sites and holts	Number	No significant decline	The works are largely restricted to within the road curtilage and agricultural fields. No otter holts or couches were recorded during field walkovers. There is potential, however, given the habitats in proximity to the landfall area, within Ballyvergan Marsh, and along water crossings, for holts and couches to become established prior to construction of the Proposed Development. As such there is potential for the works to result in a decline in the number of couching sites and holts for otter associated with the SAC.	Impacts on the number of couching sites and holts would constitute an **adverse effect on site's integrity**.
Fish biomass available	Kilograms	No significant decline	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to fish upon which otters might prey.	Impacts on the fish biomass available to otter would constitute a **negative effect on the site's integrity.**
Barriers to connectivity	Number	No significant increase	The Proposed Development is predominantly comprised of an underground cable. The exception to this is the landfall site and the converter station. Neither the landfall site, nor the converter station constitute a barrier to connectivity to otter. There may be a short term restriction of watercourses due to temporary works within the channel during construction. These will not, however be permanent and will not result in a significant decline of freshwater habitat for otter.	No potential for adverse effects on site integrity have been identified.

Table 3.25: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Twaite Shad (*Alosa fallax*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	There are no freshwater waterbodies that are associated with Blackwater River (Cork/Waterford) SAC that will be impacted by the proposed development. As such, there is no potential for loss of river accessibility for twaite shad.	No potential for adverse effects on site integrity have been identified.
Population structure: age classes	Number of age classes	More than one age class present	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to fish in the vicinity of the works. Given that twaite shad have been recorded in the waters near of Blackwater Estuary it cannot be ruled out that the fish may be present in proximity to the landfall area. As such, having regard to the precautionary principle, it must be assumed that should an accidental spill occur, that there Is potential for significant loss of twaite shad. Any loss of fish has the potential for an alteration in age class of the population. Despite this, the loss of fish from the waters of Claycastle will not preclude multiple age classes of fish being present within the SAC.	No potential for adverse effects on site integrity have been identified.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	Spawning habitat for twaite shad is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas. There is, accordingly, no potential for a loss of spawning habitat associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l	There is potential for a release of pollution to adjacent coastal waters associated with the works. However, the release of sediment laden water into the coastal waters which are already sediment rich will not result in a decrease in oxygen levels. Likewise, while the release of cement fines has the potential to result in a drop in pH within the water column there is no potential for it to cause a reduction in oxygen levels. There is, therefore, no potential for alteration in oxygen levels caused by the Proposed Development in waterbodies associated with Twaite Shad.	No potential for adverse effects on site integrity have been identified.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plant) growth	Spawning habitat for twaite shad is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas. There is no potential for a degradation in spawning habitat quality associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.

Table 3.26: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Sea Lamprey (*Petromyzon marinus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	There are no freshwater waterbodies associated with Blackwater River (Cork/Waterford) SAC. As such, there is no potential for loss of river accessibility for sea lamprey.	No potential for adverse effects on site integrity have been identified.
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to lamprey in the vicinity of the works. Given that sea lamprey have been recorded in the waters of Blackwater Estuary it cannot be ruled out that the fish may be present in proximity to the landfall area. As such, having regard to the precautionary principle, it must be assumed that should an accidental spill occur, that there Is potential for significant loss of sea lamprey. Any loss of individuals has the potential for an alteration in age class of the population. Despite this, the loss of sea lamprey from the waters of Claycaslte will not preclude multiple age classes being present within the SAC.	No potential for adverse effects on site integrity have been identified.
Juvenile density in sediment	Juveniles/m²	Juvenile density at least 1/m²	Sea lamprey spawn in freshwater rivers. The juveniles remain in freshwater until they reach the adult phase of the life cycle. At this point sea lamprey migrate to the sea where they feed on other fish species. The works are outside of any freshwater extent of the blackwater river (Cork/Waterford SAC). In addition, there is no downstream connectivity with these watercourses. As such, there is no potential for impact to juvenile lamprey associated with the Proposed Development	No potential for adverse effects on site integrity have been identified.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	Spawning habitat for sea lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	Juvenile habitat for sea lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.

Table 3.27: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – River Lamprey (*Petromyzon marinus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	% of river accessible	Access to all water courses down to first order streams	There are no freshwater waterbodies associated with Blackwater River (Cork/Waterford) SAC. As such, there is no potential for loss of river accessibility for river lamprey.	No potential for adverse effects on site integrity have been identified.
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to lamprey in the vicinity of the works. Given that lamprey have been recorded in the waters of Blackwater Estuary it cannot be ruled out that the fish may be present in proximity to the landfall area. As such, having regard to the precautionary principle, it must be assumed that should an accidental spill occur, that there Is potential for significant loss of lamprey. Any loss of individuals has the potential for an alteration in age class of the population. Despite this, the loss of lamprey from the waters of Claycastle will not preclude multiple age classes being present within the SAC.	No potential for adverse effects on site integrity have been identified.
Juvenile density in sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m	River lamprey spawn in freshwater rivers. The works are outside of any freshwater extent of the blackwater river (Cork/Waterford SAC). In addition, there is no downstream connectivity with these watercourses. As such, there is no potential for impact to juvenile lamprey associated with the Proposed Development	No potential for adverse effects on site integrity have been identified.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	Spawning habitat for river lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	Juvenile habitat for river lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.

3.4.4 Potential for Adverse Effects on Cork Harbour SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Cork Harbour SPA due to impacts associated with the construction phase of the Proposed Development as follows:

Potential for direct impact to ex situ supporting habitat for teal, grey heron, black-headed gull and lesser black-backed gull

- Degradation of wetland habitat within the SPA boundary caused by pollution/sedimentation
- Potential for noise and visual disturbance (from machinery and personnel presence) to the following species:
  - Black-headed gull
  - Common gull
  - Cormorant
  - Curlew
  - Dunlin
  - Grey heron
  - Lapwing
  - Lesser black-backed gull
  - Oystercatcher
  - Red-breasted merganser
  - Teal
  - Wigeon
- Degradation of supporting habitat caused by invasive species spread

Site Specific Conservation Objectives have been developed for Cork Harbour SPA. These have been listed in section 3.2. An assessment of the potential for adverse effects on the integrity of Cork Harbour SPA is presented hereunder.

Table 3.28: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Black-headed gull (*Chroicocephalus ridibundus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak number of 143 black-headed gulls wase recorded during marine surveys at the landfall location during the 2019/2020 season. The report notes in relation to the marine surveys that the many of the birds recorded during the marine were recorded flying past Wintering bird survey report for wintering season 2019/2020 (Nagle 2020) notes in relation to low tide and high tide counts at Claycastle that "*Small numbers of Black-headed Gull were recorded in each month (apart from March) with peak numbers of 17 and 18 recorded in November and January*." The report goes on to state that "*The Black-headed Gull is probably the most numerous and widespread gull in Ireland. It is an opportunistic species that avails of feeding opportunities on freshwaters, estuaries in marine and terrestrial areas and they commonly feed at ploughed fields, abattoirs, fish factories, sewage outfalls, rubbish dumps (Crowe 2005).*" As such, disturbance of black-headed gulls from the ZoI of the Proposed Development will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	Black-headed gulls (peak two) were recorded in the converter station site, and at Claycastle (peak 143 during marine surveys). The disruption of black-headed gulls from the ZoI of the Proposed Development does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by black-headed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.29: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Common Gull (*Larus canus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak common gull numbers were recorded during 2019/2020 wintering survey. 153 common gulls were recorded during marine surveys at Claycastle. It is of note that these records were largely birds flying past the study area. A peak count of just 7 common gulls were recorded within the ZoI at Claycastle beach during low tide counts. The bird survey report (Nagle 2020) notes that "*Common Gulls are opportunistic feeders and are unlikely to be seriously impacted by pipe-laying activities at Claycastle*" As such, disturbance of common gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gulls, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, low numbers and the opportunistic nature of common gulls are such that they are unlikely to be significantly impacted As such, disturbance of common gulls from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by common gulls.	No potential for adverse effects on site integrity have been identified

Table 3.30: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Cormorant (*Phalacrocorax carbo*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak numbers of 13 cormorants were recorded during the marine wintering bird surveys between 2019/2020. The survey report notes that the majority of birds recorded were either in flight or feeding off shore. As such, disturbance of cormorant from the works area at Claycastle will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by cormorant, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, records of cormorant are such that the area surrounding the landfall location is not of great importance in terms of foraging habitat. As such, disturbance of cormorant from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by cormorant.	No potential for adverse effects on site integrity have been identified

Table 3.31: Assessment of Potential for Adverse Effects on the site Integrity of Cork harbour SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "…*Curlew, was recorded in varying numbers each month (apart from January) with a peak.. recorded in February*…"*Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan. This has the potential to result in the permanent degradation of supporting habitat for curlew within the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.	Impacts on the intensity of use of foraging habitat used by curlew would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.32: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species".* This is supported by the findings from the 2020/2021 surveys, where ten dunlin were recorded during marine surveys carried out in 2020/2021, but none were recorded during the low tide or high tide counts. The disturbance of a such low numbers of dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for Adverse Effects on Site Integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"*. Peak counts of ten in the 2020/2021 survey season were during the marine surveys and did not indicate that Claycastle is a key foraging or roosting site for the species. There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for Adverse Effects on Site Integrity have been identified

Table 3.33: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Grey Heron (*Ardea cinerea*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A single grey heron was recorded in the proposed Converter Station Site (referred to as Ballyadam in the report). The wintering bird survey report (2019/2020) notes in relation to the converter station generally "*The site does not appear to be an important location for wetland birds in the winter due to the very limited areas of suitable habitat and Ballyadam is not likely to be of any great significance to the species of Special Conservation Interest in the nearby Cork Harbour SPA*." In relation to counts at Claycastle, again, peak counts of one heron were recorded, albeit not within the ZoI of the works. Temporary disturbance (construction phase) of small numbers of grey heron from the converter station and other possible habitat (ponds, Ballyvergan Marsh etc) does not have potential to result in a long-term population trend decrease. Grey heron will continue to use the area.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey heron, other than that occurring from natural patterns of variation	As previously noted, a single grey heron was recorded in the converter station site, and peak counts of one grey heron were recorded at Claycastle. The disruption of a single grey heron from the converter station does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by grey heron.	No potential for adverse effects on site integrity have been identified.

Table 3.34: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Cork harbour SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.35: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Lesser Black-backed gull (*Larus fuscus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of 6 lesser black-backed gulls were recorded within the converter station site. The report notes "*On one occasion, 6 Lesser Black-backed Gulls were seen flying over the site, landing briefly and then flying out of the site. The overall dry nature of Ballyadam with its rank, uncultivated grassland, large areas of exposed stone and very little open water make this site largely unattractive to gulls of any species and consequently, Lesser Black-backed Gulls are very unlikely to be seriously impacted by any development at the site.*" A peak count of 42 lesser black backed gulls were recorded at Claycastle during the 2019/2020 marine survey. It is of note, however that these were only recorded in flight over the site in strong winds. As such, the Claycastle area does not appear to be of importance for foraging or roosting lesser black backed gulls. The disruption such lesser black-backed gulls from these areas does not. Therefore, have potential to result in a long-term population trend decrease for lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull, other than that occurring from natural patterns of variation	As previously noted, a peak count of 6 lesser black-backed gulls were recorded within the converter station site, while 34 were recorded in flight at Claycastle. As such, disturbance of gulls from these areas does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.36: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Oystercatcher (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of 36 individuals were recorded within the ZoI during the winter bird surveys carried out 2020/2021 season. The survey report notes that these regularly occurring birds have become habituated to human related disturbance and their natural response is to fly to less disturbed stretches of beach. There is no potential for the temporary disturbance from Claycastle beach to cause a long-term decrease in population trend as this species will use abundant alternative habitat close by if temporarily disturbed.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	As previously noted, a peak of 36 individuals were recorded within the ZoI of the Proposed Development. The survey report notes that oystercatcher are a regularly occurring bird in the area. The disruption of birds from this area has potential to result in a reduction of use of the area by the species.	Impacts on the intensity of use of areas used by oystercatcher would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.37: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Red Breasted Merganser (*Mergus serrator*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of two individuals were recorded during the 2020/2021 season. The birds were recorded off-shore during the marine bird surveys. The species was not recorded during 2019 surveys, or the 2019/2020 season surveys. This indicates that the ZoI for the proposed development is not an important area for the species. Given these survey results, the temporary disturbance from Claycastle beach to cause a long-term decrease in population trend.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by red breasted merganser, other than that occurring from natural patterns of variation	As previously noted, a peak of just two individuals were recorded close to the landfall location. The species was not recorded during 2019 surveys, or the 2019/2020 season surveys. This indicates that the ZoI for the proposed development is not an important area for the species. Given these survey results, the temporary disturbance of two individuals does not have the potential to result in a significant decrease in timing or intensity of use of areas by red breasted merganser.	No potential for adverse effects on site integrity have been identified.

Table 3.38: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. During raptor roosts undertaken in 2020/2021 season, up to 100 teal were noted roosting within Ballyvergan Marsh. There is potential for the temporary disruption of teal from the proposed Converter Station Site, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. As previously noted, up to 100 teal were recorded within Ballyvergan Marsh. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.39: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Wigeon (*Anas penelope*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of wigeon associated with the Cork harbour SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of wigeon. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of wigeon from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by wigeon would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.40: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA –Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters, and through release of concrete through underground conduits. This has the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. Further, there is the potential for accidental spread of invasive species into the SPA boundary during the works. These invasive species have the potential to cause degradation of salt marshes within the SPA which are utilised by wildfowl. The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for adverse effects on site integrity have been identified.

3.4.5 Potential for Adverse Effects on Ballymacoda Bay SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the SCI's due to temporary impacts associated with the construction phase of the Proposed Development as follows:

- Direct impact to ex situ supporting habitat for wintering ringed plover, sanderling, dunlin, black-headed gull, common gull, lesser black backed gull, and curlew
- Deterioration in supporting habitat within the European Site boundary due to water quality impacts
- Noise disturbance impacts to the following bird species:
  - Black-headed gull
  - Common gull
  - Curlew
  - Dunlin
  - Grey Plover
  - Lapwing
  - Lesser black backed gull
  - Ringed plover
  - Sanderling
  - Teal
  - Wigeon
- Degradation of supporting habitat for SCIs caused by invasive species spread

Site Specific Conservation Objectives have been developed for Ballymacoda Bay SPA. These have been listed in section 3.2. An assessment of the potential for adverse effects on the integrity of Ballymacoda Bay SPA, in the absence of mitigation, is presented hereunder in the tables below.

Table 3.41: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Black-headed gulls (*Chroicocephalus ridibundus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak number of 143 black-headed gulls were recorded during marine surveys at the landfall location during the 2019/2020 season. The report notes in relation to the marine surveys that the many of the birds recorded during the marine were recorded flying past Wintering bird survey report for wintering season 2019/2020 (Nagle 2020) notes in relation to low tide and high tide counts at Claycastle that "*Small numbers of Black-headed Gull were recorded in each month (apart from March) with peak numbers of 17 and 18 recorded in November and January*." The report goes on to state that "*The Black-headed Gull is probably the most numerous and widespread gull in Ireland. It is an opportunistic species that avails of feeding opportunities on freshwaters, estuaries in marine and terrestrial areas and they commonly feed at ploughed fields, abattoirs, fish factories, sewage outfalls, rubbish dumps (Crowe 2005)."* As such, disturbance of black-headed gulls within the ZoI of the Proposed Development will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gulls, other than that occurring from natural patterns of variation	Black-headed gulls (peak two) were recorded in the converter station site, and at Claycastle (peak 143 during marine surveys). The disruption of black-headed gulls from the ZoI of the Proposed Development does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by black-headed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.42: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Common Gull (*Larus canus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak common gull numbers were recorded during 2019/2020 wintering survey. 153 common gulls were recorded during marine surveys at Claycastle. It is of note that these records were largely birds flying past the study area. A peak count of just 7 common gulls were recorded within the ZoI at Claycastle beach during low tide counts. The bird survey report (Nagle 2020) notes that "*Common Gulls are opportunistic feeders and are unlikely to be seriously impacted by pipe-laying activities at Claycastle*" As such, disturbance of common gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gulls, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, low numbers and the opportunistic nature of common gulls are such that they are unlikely to be significantly impacted As such, disturbance of common gulls from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by common gulls.	No potential for adverse effects on site integrity have been identified.

Table 3.43: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "…*Curlew, was recorded in varying numbers each month (apart from January) with a peak.. recorded in February*…"*Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan. This has the potential to result in the permanent degradation of supporting habitat for curlew within the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.	Impacts on the intensity of use of foraging habitat used by Curlew would constitute a **negative effect on the site's integrity**.

Table 3.44: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species".* This is supported by the findings from the 2020/2021 surveys, where ten dunlin were recorded during marine surveys carried out in 2020/2021, but none were recorded during the low tide or high tide counts. The disturbance of a such low numbers of dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"*. Peak counts of ten in the 2020/2021 survey season were during the marine surveys and did not indicate that Claycastle is a key foraging or roosting site for the species. There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for adverse effects on site integrity have been identified.

Table 3.45: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.46: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Lesser black-backed gull (*Larus fuscus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of 6 lesser black-backed gulls were recorded within the converter station site. The report notes "*On one occasion, 6 Lesser Black-backed Gulls were seen flying over the site, landing briefly and then flying out of the site. The overall dry nature of Ballyadam with its rank, uncultivated grassland, large areas of exposed stone and very little open water make this site largely unattractive to gulls of any species and consequently, Lesser Black-backed Gulls are very unlikely to be seriously impacted by any development at the site.*" A peak count of 42 lesser black backed gulls were recorded at Claycastle during the 2019/2020 marine survey. It is of note, however that these were only recorded in flight over the site in strong winds. As such, the Claycastle area does not appear to be of importance for foraging or roosting lesser black backed gulls. The disruption such lesser black-backed gulls from these areas does not. Therefore, have potential to result in a long-term population trend decrease for lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lesser black-backed gulls, other than that occurring from natural patterns of variation	As previously noted, a peak count of 6 lesser black-backed gulls were recorded within the converter station site, while 34 were recorded in flight at Claycastle. As such, disturbance of gulls from these areas does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.47: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA - Ringed Plover

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of 20 ringed plover were recorded at high tide counts at the Redbarn-Claycastle sites. Ringed plover were also recorded during marine bird surveys at Claycastle in the 2020/2021 survey season (a peak count of 50 was recorded). However the survey report notes that ringed plover were only recorded in flight some distance offshore. The numbers of ringed plover recorded during shore surveys at Claycastle as a proportion of the 1% national population threshold for ringed plover is low, and not indicative of an important foraging area for the birds. There will be no permanent loss of foraging or roosting habitat for the species. Further, the site is highly disturbed due to the level of recreational activities ongoing year-round at the site. On this basis, the disturbance of low numbers of ringed plover from this area does not have potential to result in a long-term decrease in population trends for the species.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	The Proposed Development location is such that there is no potential for disturbance to birds foraging or roosting in core habitats within the boundary of the SPA. There is potential for temporary disturbance of ringed plover from the works areas at the landfall and at Ballyvergan marsh. This disturbance, from these disturbed areas would not constitute a significant decrease in the range, timing or intensity of use of areas by ringed plover.	No potential for adverse effects on site integrity have been identified.

Table 3.48: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA - Sanderling

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Sanderling were recorded in proximity to the landfall site with a peak count of 50 recorded at high tide counts in November 2019, and 159 recorded during marine surveys in March. The Proposed Development has potential to result in localised temporary disturbance to sanderling in proximity to the landfall area. This is a relatively low proportion of the total habitat available to Sanderling, in the context of Claycastle beach, and the wider Ballymacoda bay. As such, the disturbance of these birds from the landfall area will not result in their avoidance of a key foraging or roosting area. There is no potential, therefore, for a reduction in the long-term population trends for the species.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation	The Proposed Development location is such that there is no potential for disturbance to birds foraging or roosting in core habitats within the boundary of the SPA. There is potential for disturbance of sanderling from the works areas at Claycastle. This disturbance, from the works areas would not constitute a significant decrease in the range, timing or intensity of use of areas by sanderling.	Impacts on the intensity of use of foraging habitat used by sanderling would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.49: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. During raptor roosts undertaken in 2020/2021 season, up to 100 teal were noted roosting within Ballyvergan Marsh. There is potential for the temporary disruption of teal from the proposed Converter Station Site, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. As previously noted, up to 100 teal were recorded within Ballyvergan Marsh. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.50: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda SPA – Wigeon (*Anas penelope*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of wigeon associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. There is potential for the temporary disruption of wigeon from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of wigeon. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by wigeon would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.51: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA –Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 602 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters. This has the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. Further, there is the potential for accidental spread of invasive species into the SPA boundary during the works. These invasive species have the potential to cause degradation of salt marshes within the SPA which are utilised by wildfowl however this is very unlikely to be at a level of risk above current baseline. The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for adverse effects on site integrity have been identified.

3.4.6 Potential for Adverse Effects on Blackwater Estuary SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the due to impacts associated with the construction phase of the Proposed Development as follows:

- Direct impact to ex situ supporting habitat (Claycastle beach and Ballyvergan) for wintering curlew, teal and dunlin.
- Noise and visual disturbance to wintering dunlin, curlew, teal, wigeon and lapwing.

Site Specific Conservation Objectives have been developed for Blackwater Estuary SPA. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of Blackwater Estuary SPA, in the absence of mitigation, is presented hereunder.

Table 3.52: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "…*Curlew, was recorded in varying numbers each month (apart from January) with a peak.. recorded in February*…" *Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan. This has the potential to result in the permanent degradation of supporting habitat for curlew within the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.	Temporary (construction phase) Impacts on the intensity of use of foraging habitat used by curlew would possibly constitute a **negative effect on the site's integrity**.

Table 3.53: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species".* This is supported by the findings from the 2020/2021 surveys, where ten dunlin were recorded during marine surveys carried out in 2020/2021, but none were recorded during the low tide or high tide counts. The disturbance of a such low numbers of dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species".* Peak counts of ten in the 2020/2021 survey season were during the marine surveys and did not indicate that Claycastle is a key foraging or roosting site for the species. There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for adverse effects on site integrity have been identified

Table 3.54: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Blackwater Estuary SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity.**

Table 3.55: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. During raptor roosts undertaken in 2020/2021 season, up to 100 teal were noted roosting within Ballyvergan Marsh. There is potential for the temporary disruption of teal from the proposed Converter Station Site from Ballyvergan Marsh, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. As previously noted, up to 100 teal were recorded roosting within Ballyvergan Marsh. There is potential for disturbance of these birds from a roosting area. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity.**

3.4.7 Potential for Adverse Effects on Mullaghanish to Musheramore Mountains SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs during the construction phase of the Proposed Development as follows:

- Disturbance to wintering hen harrier associated with the site.

No site-specific conservation objectives have been developed for Mullaghanish to Musheramore Mountains SPA. At the time of writing, the NPWS had not designated site-specific objectives for any of the Irish Hen Harrier SPAs.

Generic conservation objectives have been set out and are as follows:

To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Having regard to these objectives, an assessment of the potential for adverse effects on the integrity of Mullaghanish to Musheramore Mountains SPA is presented hereunder

Hen harrier (*Circus cyaneus*)

The Proposed Development is located a significant distance from Mullaghanish to Musheramore Mountains SPA. As such, there is no potential for damage or degradation to habitats within the SPA boundary.

As previously noted, hen harrier have been found to migrate outside of breeding grounds to winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990). Birdwatch Ireland (2020) note that the species "*spends winter in more coastal and lowland areas throughout Irela*nd".

As previously outlined, Wintering bird surveys carried out in February and March 2019 (Glas Ecology 2019) carried out between November 2019 to March 2020 (Nagle 2020) recorded hen harrier at Ballyvergan. The surveys reported roosting hen harrier on multiple occasions. The roost surveys indicate that the hen harriers within Ballyvergan marsh have a preference for the western side of the marsh and may occur within 700m of the Proposed Development. While it is not clear where the birds migrate to for the breeding season, having regard to the precautionary principal it is assumed that these are associated with the Mullaghanish to Musheramore Mountains SPA which is the closest breeding hen harrier SPA to the proposed development.

The wintering bird survey report goes on to state that there is potential for"… disturbance to roosting Hen Harriers at Ballyvergan Marsh during pipe-laying activities on the east side of the marsh if noise levels are likely to be persistently high in the late afternoon period between November and March." Disturbance of wintering hen harrier has the potential to result in a lack of fitness and reduced associated capacity for breeding.

Disturbance to wintering hen harrier associated with Mullaghanish to Musheramore Mountains SPA, and degradation of ex situ supporting habitat for the species would constitute a **negative effect on the site's integrity**, in the absence of mitigation.

3.4.8 Summary

Potential project-related impacts likely to adversely affect integrity of the following European sites are summarised below as follows:

Great Island Channel SAC

- Impacts to mudflats and sandflats not covered by seawater at low tide due to pollution of watercourses
- Impacts to Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) caused by accidental spread of invasive species

Ballymacoda (Clonpriest and Pilmore) SAC

- Impacts to **Estuaries** due to pollution of watercourses
- Impacts to **mudflats and sandflats not covered by seawater at low tide** due to pollution of watercourses
- Impacts to **Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) caused by accidental spread of **invasive species**

Blackwater River (Cork/Waterford) SAC

- Impacts (disturbance during construction) to **otter couches and holts, and reduction in fish biomass** due to water quality impacts

Cork Harbour SPA

- Impacts to **wintering curlew, lapwing, oystercatcher, teal** and **wigeon** caused by disturbance and degradation of ex situ supporting habitat

Ballymacoda Bay SPA

- Impacts to **wintering curlew, lapwing, sanderling, teal and wigeon** caused by disturbance and degradation of ex situ supporting habitat

Blackwater Estuary SPA

- Impacts to **wintering curlew, teal and lapwing** caused by disturbance and degradation of ex situ supporting habitat

Mullaghanish to Musheramore Mountains SPA

- Impacts to wintering **hen harrier** caused by visual and noise disturbance during construction phase in Ballyvergan marsh.

3.5 Mitigation Measures

Mitigation is prescribed hereunder to address the impacts identified such that adverse effects on site integrity of the European site do not occur.

Mitigation measures are set out in accordance with the European Commission guidance on the 'Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, (2001). Mitigation is described with respect to:

- how the measures will avoid / prevent / reduce the adverse impacts on the site to an acceptable level;
- the degree of confidence in their likely success;
- the timescale, relative to the Proposed Development, when they will be implemented;
- how and when the measures will be monitored.

All mitigation prescribed in this NIS must be implemented by the appointed Contractor for the works, in consultation with the Developer's Ecologist, and the relevant statutory bodies identified hereunder. The Contractor will incorporate the mitigation measures being outlined below into a Construction Environmental Management Plan (CEMP) for the Proposed Development and agree the CEMP with the Developer and the local authority in advance of mobilisation.

Each mitigation measures in this section apply to several European sites as per Table 3.56 below.

Table 3.56: Mitigation Measures by European site

Measure	Great Island Channel SAC	Ballymacoda (Clonpriest and Pilmore SAC)	Blackwater River (Cork/Waterford) SAC	Cork Harbour SPA	Ballymacoda Bay SPA	Blackwater Estuary SPA	Mullaghanish to Musheramore Mountains SPA
Mitigation for Watercourse Crossings	✓	✓	-	✓	✓	-	-
Mitigate Contamination of Underground Conduits	✓	-	-	✓	-	-	-
Mitigate Disturbance to Wintering Birds	-	-	-	✓	✓	✓	✓
Mitigate Spread of Invasive Species	✓	✓	-	✓	✓	-	✓
Mitigate Disturbance to Otter Couhces/Holts (if present)	-	-	✓	-	-	-	-

3.5.1 Pre-Construction Confirmatory Surveys

Given the dynamic distribution of species and habitats over time (e.g. due to other land clearance works), significant changes can arise between baseline surveys informing this AA Screening and NIS (2019-2021), and construction (est. 2023). For example, otters may establish new holts, or occupy previously inactive holes excavated by other animals; invasive species distribution will change following treatment, or dispersal by humans, animals, or water.

In advance of enabling works, the Contractor's ECoW (see section 3.5.2) will complete pre-construction confirmatory surveys of the following features of relevance to European sites:

- Otter breeding/resting sites within the ZoI of the Proposed Development (150 m where access allows); and,
- Invasive species within the ZoI of the Proposed Development (boundary of Proposed Development).

Otter surveys will be carried out having regard to guidance of NRA (2006, 2009); invasive species will be carried out having regard to guidance of Transport Infrastructure Ireland (TII,2020a,b)

The results of pre-construction confirmatory surveys otter and invasive species surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping.

Survey reporting and mapping will also be provided to the local authority, and the Employer's Representative team (including EirGrid's ecologist).

Three years of wintering bird data informed the baseline data; with consistent patterns recorded during that time in terms of bird numbers and distribution. As such, no pre-construction confirmatory wintering bird surveys are considered as required.

3.5.2 Ecological Supervision and Monitoring

An Ecological Clerk of Works (ECoW) will be employed by the Contractor to oversee implementation of ecological mitigation and support the Contractors Environmental Clerk of Works (Contractor's EnCoW) responsible for wider environmental mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented. The Contractor's ECoW will also ensure any disturbance licenses are arranged for otter in the event that confirmatory pre-construction surveys identify breeding or resting sites within the ZoI.

The Contractor's ECoW will advise on ecological mitigation measures implementation the scheduling of works and will be included in regular liaison meetings between project teams. The Contractor's ECoW will also oversee the monitoring for hen harrier and field monitoring will be conducted by an experienced ornithologist as outlined in Section 3.5.5.

An independent Environmental Clerk of Works (EnCoW) will additionally be employed on behalf of the Employers Representative team. The independent ENCoW will review and comment on the reports generated by the Contractor's EnCoW/ECoW; namely pre-construction survey reports, and the specific monitoring and compliance reports referenced under the mitigation measures in this section

3.5.3 Mitigation Against Water Quality Impacts to Surface Water

The principle likely pollution sources from construction activities are from water crossings associated with the cable route. Other sources are contaminated site run-off, including silty water arising from exposed ground / stockpiles / and from accidental leaks / spills of oil / fuels from machinery or storage areas, and run off from areas where concrete pours are taking place.

Mitigation measures to avoid / prevent contaminated runoff and pollution from site are prescribed in below.

Table 3.57: Mitigation against surface water pollution

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
At a minimum, all pollution control measures will be designed, installed, and maintained in accordance with measures outlined below and under the supervision of the Contractor's Environmental Clerk of Works (EnCoW). **Concrete** The pouring of concrete will be required during the construction phase. To prevent the runoff of concrete into nearby watercourses and drains, the following will be implemented. • No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck. • Quick setting concrete mixes will be used to reduce the risk of contaminated run-off to the nearby watercourses. • Concrete trucks will be washed down in a sealed mortar bin / skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area. • Where concrete pours are to take place instream they will only take place within an isolated, dry, works area. • Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour, and remain off until concrete has hardening negating a run-off risk; and such that the discharge will not result in a change in pH of +/- 0.5 units.	Measures will prevent the uncontrolled releases of pollutants into the environment.	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the enabling and construction works commence at each location.	The Contractor's EnCoW will carry out ongoing monitoring of all pollution control measures. The Contractor will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions.	Measures will prevent and/or remedy the uncontrolled releases of pollutants into the environment.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• Where concrete pours are required within a watercourse, the EnCoW will regularly monitor the pH of the watercourse during concrete works. Should any change in pH +/-0.5 be detected concrete works shall immediately be ceased (handheld monitors will have maximum variance of +/- 0.1). The entry point to the watercourse will then be identified and implement appropriate measures to prevent further escape to the environment. • It will be ensured that covers are available for freshly poured concrete to avoid wash off in the event of rain. • Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal. • Concrete works will be scheduled during dry weather conditions to reduce the elevated risk of runoff. • NPWS and IFI will be notified immediately of any concrete spills into watercourses. **Hydrocarbons** Where mobile equipment is required e.g. generators, these will be housed in a suitably sized bund / plant nappy such that any leaks / spills are intercepted. All mobile equipment used will be stored within a plant nappy. Operators will regularly inspect the plant nappy, at a minimum on a daily basis, and replace it where it has become contaminated. Fuelling and lubrication of plant and equipment will be restricted to the construction compound sites, or laydown areas. No refuelling will be					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
permitted to occur within 50m of any watercourse or drainage ditch. All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of waste legislation. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained during induction to site by the EnCoW in the use of this equipment. Should use of a spill-kit be required it shall be immediately re-stocked. All spill-kits shall be inspected on a weekly basis by the SHEQ officer to ensure they are maintained as fit for purpose. Records relating to these inspections shall be kept. Welfare / hygiene facilities will be located within the construction compounds. All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No wheel wash water will be discharged into any watercourses or drainage ditches.					

Table 3.58: Mitigation Proposed for Watercourse crossings

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Surface Water Protection for Open Trench Water Crossings Where open trench crossings are to be carried out (as outlined in section 2.3.1) there is a risk of downstream transportation of pollutants caused by the works. The following measures shall be undertaken where trenchless construction methods are utilised for crossings • Works at each watercourse crossing shall be monitored by the Contractor's EnCoW. • Prior to the works commencing, the measures prescribed in this section shall be installed to prevent the downstream transportation of surface water run off associated with vegetation clearance. This may be through the use of features like hay bales or silt booms. Monitoring of these measures to ensure their continued effectiveness will take place on an on-going basis while the works are proceeding. • The clearance of riparian vegetation will be kept to the minimum required for the facilitation of the works such that no unnecessary exposure of riverbanks occurs. • Works to clear vegetation shall take place from the bank with vegetation pulled back towards the land. The vegetation removed shall be transported off site and disposed of appropriately. • Following the vegetation clearance, a dry works area shall be established. The measures required to achieve this must be appropriate for the size and flow associated with each watercourse. This may be achieved by: – Isolating the entire watercourse and over pumping the flow. The outflow of any over pumped river shall be placed such that there is no scouring of the riverbed. This will be monitored on an on-going basis by the Contractor's EnCoW. Should scouring be identified (visually) the Contractor's EnCoW will oversee the moving of the outflow such that scouring does not occur.	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the construction works commence	The Contractor's EnCoW will carry out daily monitoring of all pollution control measures. The Contractor will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions.	Measures will ensure all adverse effects associated with open trench construction are avoided

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
– Isolating half of the watercourse through the use of measures such as sandbags (double-bagged, containing only washed sand, from a licensed quarry) or aqua dams and diverting the flow around the works area. • Following pollution control measure setup, but prior to instream works commencing, the isolated area shall be inspected by the Contractor's EnCoW to ensure that the watercourse is sufficiently protected. The Contractor's EnCoW shall direct the Contractor to take corrective actions required. The Contractor's will record all works authorisations, report these to the independent EnCoW within the Employers Representative Team, and maintain on file for inspection as required. • Should pumping out of the isolated area be required to maintain the dry works area, it shall be ensured that any discharge is treated appropriately prior to entering the watercourse. This may be achieved by discharging to a treatment system such as a silt buster or similar, discharge to a silt bag, or discharging to an area of the watercourse that is protected by a silt boom. These measures shall be used in combination where ground conditions are such that just one measure is not achieving sufficient protection. The success of these measures shall be monitored regularly by the Contractor's EnCoW as works proceed at the watercourse crossings. • Where the implementation of these measures fail, or are inadequate, the Contractor will implement adapted measures (for example replacement sediment treatment system) in agreement with the Contractor's EnCoW and the Employers Representative Team. • Any diversion or over pumping of watercourses shall be sized such that they will accommodate a 1% AEP flood event over the period in question, so as to prevent the overtopping of work areas.				
Surface Water Protection for HDD Water Crossings Where trenchless crossings are to be carried out (as outlined in Section 2.3.1) there is a risk of pollution caused	Measures prescribed as best practice and are	Pollution prevention measures will need to be in place before the	The Contractor's EnCoW will carry out daily monitoring of all pollution control measures.	Measures will ensure all impacts associated with

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
by run off and frack out associated with the works. The following measures shall be undertaken where trenchless construction methods are utilised for crossings. • The Contractor will prepare a trenchless construction Method Statement which will outline the standard approach for the trenchless construction. The Method Statement will include a contingency plan for break-out and for excessive ground settlement. The Method Statement will be agreed with the Employer's Representative on site before construction commences, and the local authorities if required by the planning conditions.. • The Contractor will undertake the trenchless construction in accordance with *British Standard EN 16191:2014 Tunnelling machinery. Safety requirements* and *CIRIA C648 Control of water pollution from linear construction projects Technical Guidance.* • To prevent loss of bentonite or 'frack out' from occurring a series of actions will be implemented. The drill fluids operator will monitor drill fluid density, viscosity and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility. In cases where a risk of frack out is identified, viscometers will be used to measure drill fluid gel strength and shear strength. Filtrate can also be measured to calculate the amount of filter cake building up on the internal wall of the bore. Any increases in pump pressure experienced by the drill operator will be investigated immediately to prevent the risk of pressure build up within the annulus. In some circumstances, dependant on the drilling equipment used, the pilot drill borehole assembly will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall. This will give an early indication of pressure build up in the hole and allow the drill operator to prevent a 'break-out'. If there is a risk of a 'frack-out' a number of measures will be implemented including (1) pumping a pill of drilling fluid with a higher density to the risk zone (2) circulate and pump loss circulation material (typically cork or manufactured inert polymers) to the risk	proven technologies / methods.	construction works commence	Constant monitoring of the drilling operations will be carried out by the Contractor. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions.	trenchless construction are controlled and managed.

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
zone to seal the risk zone, grouting of the risk zone, and, or launch a packer before the risk zone. • Monitoring of the drilling operations by the Contractor will comprise daily visual inspection of the pits and monitoring of the volume of returns flowing back to the entry pit. The monitoring personnel will be in constant communication with the drilling rig operator and thus will be able to immediately cease drilling if necessary.				

3.5.4 Mitigation Against Contamination of Underground Conduits

There is potential for the release of concrete associated with piling activities at the Converter Station. Mitigation measures to avoid / prevent underground conduit contamination from works associated with the development are prescribed below.

Table 3.59: Mitigation Against Contamination of Underground Conduits

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Cast in situ concrete piles will be installed in the Converter station site. Given the karst nature of the site, the following mitigation is proposed in order to prevent contamination of ground water. The contractor shall develop a Piling Risk Assessment and Environmental Management Plan which will confirm how the works will be executed and will form part of the CEMP. The plan will include the implementation of a robust monitoring programme, and an action plan to mitigate environmental incidents. The management plan shall be submitted by the Contractor to the Employers Representative Team, and the relevant authorities for discussion and acceptance prior to the commencement of piling activities at Ballyadam. The Contractor shall monitor the drilling of the piles to determine the depth and occurrence of soft or voided ground which could be indicative of karst features. Casings will be used during the piling activities. Where there is the potential for encountering of karst features, casings will left in situ to prevent leaching of concrete into underground voids. Measures to be outlined in contracts will include, but will not be limited to:. • A minimum of one Geotechnical Engineer and one Resident Engineer will supervise the piling works. Supervision of each piling rig will be required. • The piling operator will be experienced in successful piling within Karst regions. • Clear lines of communication with defined roles and responsibilities will be maintained between the site	Measures prescribed as best practice and are proven technologies / methods.	CEMP shall be in place prior to the commencement of works at the Converter station. .	The Contractor's EnCoW will monitor pollution measures daily, or more regularly, as determined by the Contractor in consultation with the Employers Representative Team and the relevant authorities, . Constant monitoring of the drilling operations will be carried out by the Contractor. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions	Measures will prevent the ingress of concrete into underground karst features thereby ensuring any adverse effects associated with concrete piling are avoided.

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
team, the Contractors and the Design Engineers throughout the works. • Monitoring of the concrete volumes poured into the pile against the estimated volume that the pile requires will be carried out, to ensure that concrete is not being lost into voids in the ground. • Monitoring of piles for potential vertical settlement of fresh concrete; an indicator of potential concrete loss.				

3.5.5 Mitigation Against Disturbance to Wintering Birds

The principle likely disturbance from construction activities are from works within or in close proximity to Ballyvergan Marsh, and Claycastle beach. Mitigation measures to avoid / prevent noise disturbance form works associated with the development are prescribed in below.

Table 3.60: Mitigation Against Disturbance to Wintering Hen Harrier

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
The potential for disturbance to hen harriers has been identified for works at Claycastle, within Ballyvergan Marsh, and at the road alongside the marsh where works proceed at early morning or late afternoon between November and March inclusive. Prior to the commencement of the works, a sound reducing hoarding shall be placed along works areas adjacent to and within Ballyvergan Marsh, at Claycastle Beach Restrictions of high-noise level operations, (e.g. breaking out of road surfaces) to outside of arrival and departure times as outlined by O'Donoghue i.e. commencing work no earlier than 50 minutes after sunrise and concluding 90 minutes before sunset. During the works at Claycastle, within Ballyvergan Marsh, and at the road alongside the marsh where works proceed at early morning or late afternoon between November and March inclusive: Monitoring for hen harrier shall take place by the an appropriately experienced ornithologist.	Measures prescribed as best practice and are proven technologies / methods.	On-going throughout the works between November and March inclusive.	The Contractor's EnCoW will carry out daily monitoring of noise reduction measures. The Contractor's EnCoW will oversee monitoring by the specialist ornithologist appointed by the Contractor for hen harrier. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions	Measures will ensure all adverse effects associated with noise and visual disturbance to hen harrier are avoided

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Should hen harrier be observed returning to a roost, works shall cease until the bird has left. Details pertaining to hen harrier activities and subsequent requirements for work stoppage will be recorded daily and provided to the Developer's Ecologist and Local Authority on a weekly basis.				

: Mitigation Against Disturbance to Wintering Waterfowl

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• Prior to the commencement of the works, a sound reducing hoarding shall be placed along works areas adjacent to and within Ballyvergan Marsh, at Claycastle, beach and along the roadside at Loughs Aderry and Ballybutler.. This will help to reduce the noise impacts associated with the construction phase of the works. • The barrier material shall have a mass per unit area exceeding 7kg/m2 in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4. • All plant used during the construction phase shall be the quietest of its type practical for achieving the works, as demonstrated in writing by the Contractor to the local authority, with reference to other noisier models. • All plant shall be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of the specific noise reduction measures in the next bullet. • The following will be incorporated to reduce the impact further: – The use of mufflers on pneumatic tools – Effective exhaust silencers – Sound reducing enclosures – Machines in intermittent use shall be shut down during periods where they are not required • During works at Claycastle and adjacent to Ballyvergan marsh noise levels will be monitored outside of the	Measures prescribed as best practice and are proven technologies / methods.	Sound reduction hoarding will need to be in place before the construction works commence Implementation of plant specific noise reduction to take place on an ongoing basis.	The Contractor's EnCoW will carry out daily monitoring of noise reduction measures and monitoring of noise levels on a continuous basis during works at Ballyvergan Marsh and at Claycastle beach. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions	Measures will ensure any adverse effects associated with noise disturbance are avoided.

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
noise hoarding. Should noise levels within the reed swamp exceed 70dBA works will cease and measures taken to reduce sound levels to below this threshold.				

3.5.6 Measures to Mitigate Against the Spread of Invasive Plant Species

It is an offence under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) to plant, disperse, allow, or cause to disperse, spread or otherwise cause to grow any plant species specified in the Third Schedule of the Regulations.

Japanese knotweed, and Himalayan balsam have been recorded in within the ZoI of the Proposed Development.

There is also the potential for instream and bankside works at trenchless crossings to disperse invasive material present there downstream, and/or to introduce new invasive material, in the absence of mitigation measures.

In order to comply with the Regulations, the appointed Contractor will ensure biosecurity measures are implemented during the construction phase to ensure the introduction and/or spread of invasive species is prevented. Biosecurity measures which will be implemented during the construction phase are prescribed in Table 3.61 below

Table 3.61: Mitigation Against Spread of Invasive Species

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Japanese knotweed, and Himalayan balsam been recorded within the ZoI to the development. There is potential for additional stands of invasive species to be present within or adjacent to the works areas in areas which could not be surveyed due to Covid-19 and/or third party access restrictions, or following establishment of new populations between baseline surveys, and construction.. • Prior to works commencing a full invasive species survey will be carried out. The pre-construction invasive species survey will be carried out within the works areas, including compound locations and laydown areas, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas. • The invasive species survey will be carried out during the appropriate growing season (May – October). The findings of this invasive species survey will be incorporated into the measures below, by the Contractor's EnCoW and any specialists. • Any stands of invasive species recorded within the ZoI will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for (4m for Japanese knotweed following Fennell et al., 2018; buffer not required for other species). No works will be carried out within the exclusion zones unless approved by the Contractor's EnCoW. • The Contractor's EnCoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species. The toolbox talk will take place prior to works commencing in any areas where Invasive Species have been recorded. • All machinery will be steam-cleaned prior to entering and before leaving site	Measures prescribed as best practice and are proven technologies / methods.	Biosecurity measures will be implemented throughout the duration of the construction works.	The Contractor's EnCoW will inspect and monitor all biosecurity measures to ensure they are undertaken correctly. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to the independent EnCoW within the Employer's Representative Team, in addition to any statutory bodies in compliance with planning conditions	Biosecurity measures will ensure any adverse effects associated invasive species spread are avoided.

3.5.7 Measures to Mitigate Against the Disturbance of Otter

Field surveys did not identify any holts or couches during field surveys. However, there is potential for otter holts and couches to be present in areas that have not been surveyed to date due to Covid-19 and third party land access restrictions. Further, additional holts and couches may become established prior to the commencement of construction. Mitigation to prevent impact to same is outlined hereunder.

Table 3.62: Mitigation Against Disturbance to Otter

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
The Contractor will ensure an initial confirmatory otter survey is undertaken in advance of the commencement of any works within 150m of the works areas as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory pre-construction survey will be conducted no more than 10-12 months prior to construction commencing. Should holts be identified within 150m of the proposed development the following will, at a minimum, be employed, unless otherwise agreed with the NPWS: • No works will be undertaken within 150m of holts where breeding females or cubs are present. • Works within 150m of such a holt can only take place following consultation and in agreement with the NPWS • No wheeled or tracked vehicles of any kind will be used within 20m of active but non breeding holts • No light work such as digging by hand or scrub will take place within 15m of such holts except under license from NPWS • The identified exclusion zones will be fenced and clearly marked on site prior to any invasive works. • All contractors on site will be made fully aware or the procedures in relation to the holts by the EcoW	Measures prescribed as best practice and are proven technologies / methods.	Confirmatory surveys will be carried out prior to works commencing. Should any exclusion zones be identified these shall be established prior to works commencing and remain in place until such time as works are complete at the location, or otherwise agreed with NPWS>	The ECoW will undertake confirmatory survey. Should exclusion zones be established these will be monitored by the ECoW for compliance.	Measures outlined will ensure any adverse effects associated with potential disturbance to otter holts or couches are prevented.

3.1 Conclusion

The mitigation measures detailed in Section 3.6 of this NIS will ensure no adverse effects on the integrity of any European sites in light of the site's conservation objectives

Based on the assessment of the Proposed Development alone and in combination with other projects and plans, including the implementation of mitigation measures, it can be concluded that no adverse effects on the integrity of any European sites will arise, in view of the site's conservation objectives.

As such, the Board is enabled to conclude that the Proposed Development shall not adversely affect the integrity of a European site, alone and in combination with other projects and plans (including the other elements of the Project).

4 References

Bailey JP (1994) Reproductive biology and fertility of *Fallopia japonica* (Japanese knotweed) and its hybrids in the British Isles. Pages 27–37 in de Waal LC, Child LE, Wade PM, Brock JH, eds. Ecology and Management of Invasive Riverside Plants. Hoboken, NJ: Wiley

British Standard (2014) Code of construction practice for noise and vibration control on construction and open sites – Part 2: Vibration

Burke B, Lewis L, Fitzgerald N, Frost T, Austin G, and Tierney D (2018). Estimates of waterbird numbers wintering in Ireland, 2011/12 – 2015/16. Irish Birds 11: 1-12.

Clarke, R. and Watson, D. (1990). The Hen Harrier Winter Roost Survey in Britain and Ireland. Bird Study 37, 84-100. Clarke, R. and Watson, D. (1997).

Cronk QCB, Fuller JL. (2001). Plant invaders: the threat to natural ecosystems. London: Earthscan Publications.

Crowe O. (2005) Ireland's Wetlands and their Waterbirds: Status and Distribution. Birdwatch Ireland.

Currie, F. & Elliott, G. (1997). Forests and Birds: A Guide to Managing Forests for Rare Birds. Forestry Authority, Cambridge and Royal Society for the Protection of Birds, Sandy, UK. As per Ruddock & Whitfield (2007).

DAHG (2014) Guidance to Manage the Risk to Marine Mammals from Man-made sound sources in Irish Waters

Department of Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.

Environment Agency (2003) River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual.

European Commission (2001) Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC

Fennell, M., Wade, M., Bacon, K., (2018); Japanese knotweed (Fallopia japonica): An analysis of capacity to cause structural damage (compared to other plants) and typical rhizome extension

Fossitt, J., (2007) A Guide to Habitats in Ireland. The Heritage Council of Ireland Series. ISSN 1393 – 68 08

Gilbert, G., Stanbury, A.,Lewis, L., (2021). 2013 Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 43:1-22

Hejda M, Pysek P, Jarosik V. (2009). Impact of invasive plants on the species richness, diversity and composition of invaded communities. Journal of Ecology 97: 393–403.

Holman et al, (2014) The Institute of Air Quality Management '*Guidance on the Assessment of dust from demolition and construction*' (

Irish Water (2021). Appropriate Assessment Screening Determination. Site Investigation Works for the Midleton WwTP Upgrade Scheme (Phase 1). Available online at

https://www.water.ie/docs/projects-plans/our-projects/cork/Midleton%20WWTP%20Upgrade%20Scheme%20Site%20Investigation%20Works

Kimberley , S., and Coxon, C. (2013). Evaluating the Influence of Groundwater Pressures on Groundwater-Dependent Wetlands (2011-W-DS-5) STRIVE Report. Prepared for the Environmental Protection Agency by Trinity College Dublin

Lewis, L. J. and Tierney, T. D. (2014) Low tide waterbird surveys: survey methods and guidance notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Lockhart, N., Hodgetts, N., Holyoak, D. (2008). Ireland Red List No. 8 Bryophytes. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Love, H., Maggs, C., Murray, T., Provan, J., (2013). Genetic evidence for predominantly hydrochoric gene flow in the invasive riparian plant *Impatiens glandulifera* (Himalayan balsam). Annals of Botany 112: 1743–1750, 2013.

McCorry, M., Ryle, T. (2009) Saltmarsh Monitoring Project 2007-2008. Volume 1. A Report for Research Branch, National Parks and Wildlife Service.

NPWS (1997) Site Synopsis: Ballyvergan Marsh

NPWS (2010) Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10

NPWS (2011a) Conservation Objectives: Saltee Islands SAC 000707 and Saltee Islands SPA 004002. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2011b) Conservation Objectives: Roaringwater Bay and Islands SAC 000101. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2011c) Conservation Objectives: Slaney River Valley SAC 000781. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012) Blackwater Estuary Special Protection Area (Site Code 4028) Conservation Objectives Supporting Document Version 1.

NPWS (2012a) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012b) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012c) Conservation Objectives: Blackwater Estuary SPA 004028. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2012d) Annex 2: Bird species' status and trends reporting format for the period 2008-2012.

NPWS (2012e) Site Synopsis. Mullaghanish to Musheramore Mountains SPA 004162

NPWS (2013) Site synopsis Great Island Channel SAC 001058.

NPWS (2014a) Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014b) Conservation Objectives: Blasket Islands SAC 002172. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014c) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014e) Cork Harbour Special Protection Area (Site Code 4030) Conservation Objectives Supporting Document Version 1.

NPWS (2014f) Ballymacoda Bay Special Protection Area (Site Code 4023) Conservation Objectives Supporting Document.

NPWS (2014g) Blackwater Estuary Special Protection Area (Site Code 4028) Conservation Objectives Supporting Document.

NPWS (2014h) Site Synopsis Ballymacoda Bay SPA 004023

NPWS (2014i) Site Synopsis Blackwater Estuary SPA (004028)

NPWS (2015a) Conservation Objectives: Ballymacoda (Clonpriest and Pillmore) SAC 000077. Version 2. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015b) Conservation Objectives: West Connacht Coast SAC 002998. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015c) Conservation Objectives: Ballymacoda Bay SPA 004023. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015d) Site Synopsis Cork Harbour SPA 004030

NPWS (2015e) Site Synopsis Ballymacoda (Clonpriest and Pillmore) SAC 000077.

NPWS (2018) Natura 2000 Standard Data Form. Mullaghanish to Musheramore Mountains SPA IE0004162.

NPWS (2018a) Natura 2000 Standard Data Form. IE0002170, Blackwater River (Cork/Waterford) SAC

NPWS (2018b) Natura 2000 Standard Data Form. Cork Harbour SPA IE0004030

NPWS (2019a). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by Deirdre Lynn and Fionnuala O'Neill

NPWS (2019b). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by Deirdre Lynn and Fionnuala O'Neill

NPWS (2019c) Natura 2000 – Standard Data Form. IE0001058, Great Island Channel SAC.

NPWS (2019d) Natura 2000 Standard Data Form. IE0000077, Ballymacoda (Clonpriest and Pillmore) SAC

NPWS (2020) Conservation objectives for Mullaghanish to Musheramore Mountains SPA [004162]. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.

NRA (2006) Guidelines for the Treatment of Otter Prior to the Construction of National Road Schemes

Ó Néill, L., Veldhuizen, T., de Jongh, A., Rochford, J. (2009). Ranging behaviour and socio-biology of Eurasian otters (Lutra lutra) on lowland mesotrophic river systems. European Journal of Wildlife Research: 55: 363-370.

O'Donoghue, B.G., (2021): Hen Harrier Circus cyaneus ecology and conservation during the non-breeding season in Ireland, Bird Study *67*(3), 344-359

Perrin, P, Waldren, S., Penk, M., O'Neill, F., (2020) Saltmarsh Function and Human Impacts in Relation to Ecological Status (SAMFHIRES).

Petty, S. (1998). Ecology and conservation of raptors in forests. Forestry Commission Bulletin 118. HMSO, London.

Romin, L.A. & Muck, J.A. (1999). Utah field office guidelines for raptor protection from human and land use disturbances. USFWS Utah Field Office, Salt Lake City. Unpublished report.

Rouifed S, Puijalon S, Viricel MR, Piola F (2011) Achene buoyancy and germinability of the terrestrial invasive *Fallopia 3 bohemica* in aquatic environment: A new vector of dispersion? Ecoscience 18:79–84

Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

Ruddock, M., Whitfield, D. (2007). A Review of Disturbance Distances in Selected Bird Species. A Report from Natural Research (Projects) Ltd to Scottish National Heritage.

Scottish Environment Protection Agency (2014) Land Use Planning System SEPA Guidance Note 31. Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and groundwater Dependent Terrestrial Ecosystems (Version 3).

Smiddy, P., O'Halloran, J., Coveney, J. A., Leonard, P. G. & Shorten, M. (1995) Winter wildfowl populations of Cork Harbour: an update. Irish Birds 5, 285-294. As per NPWS 2014.

Van der Wal R, Truscott A, Pearce I, Cole L, Harris M, Wanless S. (2008). Multiple anthropogenic changes cause biodiversity loss through plant invasion. Global Change Biology 14: 1428–1436.

Watson, D (1997) The Hen Harrier Winter Roost Survey. Thirteen winters' data reveal serious declines. Raptor 1996/7, 41-45.

Watson, D. (1977). The Hen Harrier. Poyser, Berkhamsted.

Whitfield, D. P., Ruddock, M., & Bullman, R. (2008). Expert opinion as a tool for quantifying bird tolerance to human disturbance. Biological Conservation,141(11), 2708-2717.

A. DAU Response

An Roinn Turasóireachta, Cultúir,
Ealaíon, Gaeltachta, Spóirt agus Meán
Department of Tourism, Culture,
Arts, Gaeltacht, Sport and Media

Our Ref: G Pre00245/2020
(Please quote in all related correspondence)

16/12/2020

Mott MacDonald
South Block
Rockfield
Dundrum
Dublin 16
D16 R6V0

Via email: donna.hassett@mottmac.com

Re: Celtic Interconnector project

A chara

I refer to correspondence to the Department of Culture, Heritage and the Gaeltacht received in connection with the above.

Outlined below are heritage-related observations/recommendations co-ordinated by the Development Applications Unit under the stated heading(s).

Archaeology

The Department refers to the pre-planning scoping for the landfall and terrestrial elements of the above-proposed infrastructural development. While detailed comments on the terrestrial archaeological requirements will be forthcoming as part of an Archaeological Impact Assessment (AIA), any such archaeological assessment should include a detailed Underwater Archaeological Impact Assessment (UAIA) as set out below.

- All known or potential impacts to watercourses (coastal, riverine, lacustrian, stream, etc.) or associated sites and features (e.g. bridges, fording points, etc.) should be assessed as part of the Underwater Archaeological Impact Assessment (UAIA).
- The services of a suitably qualified and suitably experienced underwater archaeologist should be engaged to undertake the UAIA.
- This UAIA should be licence to this Department and a detailed method statement should accompany the licence application.
- The UAIA should seek to assess all impacts to any watercourse, immediate coastal fringe, etc. for any potential impact to cultural heritage.
- The UAIA should include a metal detection survey and this too should be appropriately licensed.

- The UAIA should assess all potential impacts from plant and machinery while works are being undertaken including from haul roads, work compounds, etc.
- The results of the UAIA should be submitted to the National Monuments Service as Further Information.
- The UAIA should put forward mitigation strategies to negate impact on known or potential underwater cultural heritage.

Reason: To ensure the continued preservation (either *in situ* or by record*)* of our underwater cultural heritage and all associated features, objects and structures.

Nature Conservation

The Department welcomes the invitation to make a submission in relation to the Celtic Interconnector project at this early stage. The following observations are made by the Department in its role as a statutory authority with overarching responsibility for nature conservation and the nature directives (i.e. the Birds and Habitats Directives).

The Department notes that most of the proposed development is away from any designated areas or areas of known conservation importance. The proposal to route the underground cable within existing public roads is welcomed as this reduces potential ecological impacts. Subject to the findings of the biodiversity component of Environmental Impact Assessment to be prepared and mitigation measures to be identified relating to the relocation and enhancement of habitat for scarce or rare plant species on the site this Department has, at this time, not identified any concerns that cannot be mitigated relating to the Ballyadam site. The intention to provide surface water storage capacity within the Ballyadam site is noted and the creation of a wetland with the dual purpose of providing water storage and biodiversity to fulfil this function would be encouraged. The calcareous nature of the site would also lend itself to the creation of species rich grassland as part of any landscaping plan.

Subject to more detailed assessment at the application stage and the findings of the EIA and NIS, the Department is at this time satisfied that most of the terrestrial cable route is unlikely to cause significant ecological concern provided proper mitigation measures are implemented. It is noted that some river crossings will be required and these will require appropriate mitigation measures to protect watercourses and associated dependant species. In particular strictly protected Annex IV species such as Otters and Bat species should be surveyed for at bridges and river crossings and any possible impacts on them or their habitats prevented. The Department would like to draw your attention to the presence of Clasharinka Pond pNHA (sitecode 1183), Ballyquirk Pond pNHA (sitecode 1235) in the vicinity of the proposed line route but is satisfied that the current proposal avoids these sites. It is noted that the proposed cable route passes adjacent to Lough Aderry and Ballybutler pNHA (sitecode 0446) and the EIA should assess any potential impacts to this site. The Department would recommend the cable route be contained within the existing road way to reduce any potential for negative effects.

Any surplus materials derived from the excavations for the cable route should only be disposed of at pre-approved licensed facilities.

The Department is, however, concerned about proposal to route the line from Claycastle beach and to traverse the eastern edge of Ballyvergan Marsh proposed Natural Heritage Area pNHA (site code 000078) for a section of up to approximately 200m in length. Such works within the pNHA pose a threat to the conservation interests of the site which will need to be fully addressed in the application. A full ecological assessment of the potential impacts at this location will need to be carried out and any negative impacts avoided or compensated for. From a nature conservation viewpoint, it would appear there is an alternative route onshore along the public road between the townlands of Clonard East and Redbarn, approximately 1.3km south west of the proposed location and we would suggest that this is considered as an alternative. This alternative route remains outside and north of Ballymacoda Bay SPA (4023) and would also avoid the line potentially traversing the northern boundary of Ballyvergan Marsh pNHA.

In relation to the intertidal portion of the cable route, this area is outside Ballymacoda Bay SPA however bird species of conservation concern may use this area in winter and could be disturbed by the works. The EIA and NIS should assess this potential adverse effect. It would be possible to avoid any potential impact on wintering bird species by carrying out the works outside the period when they are present.

Marine Nature Conservation

According to Article 6(3) of Council Directive (92/43/EEC) (the Habitats Directive) 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. The provisions of this article have been transposed into the Irish Statute by Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations (SI 477 of 2011). This regulation requires that “a screening for Appropriate Assessment of a plan or project for which an application for consent is received…shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site. It is noted from the submitted documentation that the proposed development would be located less than one kilometre from Blackwater River (Cork/Waterford) SAC. There may also be further interaction with other nature sites. In order to fully comply with this legal requirement the proponents should include a Natura Impact Statement screening document with application for consent. If this NIS evaluates that there is not likely to be a significant impact on adjacent European Sites or their constituent qualifying interests or avian species of conservation concern this must be shown in a Concluding Statement.

It must be noted that all cetaceans are listed under Annex IV (including those in Annex II) of Council Directive 92/43/EEC (the Habitats Directive). Accordingly, under Article 12 of that Directive, it is an offence to deliberately capture, disturb or kill a cetacean or take actions that result in deterioration or destruction of their breeding sites or resting places.

This has been transposed into Irish Law by Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations. Introduction of certain sound sources into the marine environment, as may result from construction (*e.g*. trenching, dredging etc.) over the foreshore, have the potential to cause injury and possibly mortality in these species. All marine mammals are protected wild animals under the Fifth Schedule, which includes all cetacean and seal species, of the Wildlife Act (39 of 1976) and Amendments. Under Section 23 (as amended in 2000), it is an offence to kill, injure or wilfully interfere with or destroy the breeding place or resting place of any protected wild animal.

In addition to the statement related to the European Sites the proponent should also evaluate whether the works would have a potential to interact with marine mammals. The presentation of data related to marine mammal species must be of sufficient resolution to predict the likely interaction with these species over both a spatial and temporal scale. Records of survey should include the months when sampling occurred and the numbers of animals encountered in the vicinity of the proposed development. Some of this detail has been included in the letter already submitted. The assessment should contain sufficient detail including *inter alia*

1. Noise characteristics at source (*i.e*. sound pressure levels, sound exposure levels, frequency, bandwidth, duration of exposures) and information concerning propagation in air/water if applicable.
2. The identification, where appropriate, of measures required to mitigate such impacts. This Department has a current document (https://www.npws.ie/sites/default/files/general/Underwater%20sound%20guidance_Jan%202014.pdf) in relation to the interaction of man-made noise and mammals in the marine environment. The proposed development may be close in the sound sources being emitted to dredging and the mitigation indicated in this document may be useful in formulating appropriate measures to limit potential interactions with seals or cetaceans.
3. It is recommended that a suitably qualified marine mammal ecologist should be involved in undertaking relevant assessments.

You are requested to send further communications to the Development Applications Unit (DAU) at **manager.dau@chg.gov.ie**, or to the following address:

> The Manager, Development Applications Unit (DAU), Government Offices, Newtown Road, Wexford, Y35 AP90

Is mise, le meas

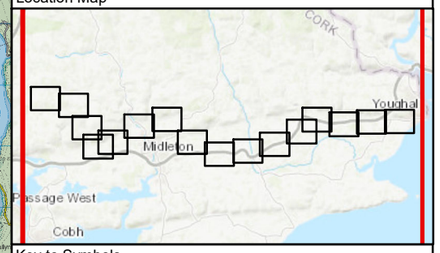
Joanne Lyons
Development Applications Unit

B. Habitat Mapping

Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16

MIDLETON
Mainistir na Corann
Carrigtohill
Carraig Thuathail
Foaty Island
Ballyvacorra
Baile na Cora
GREAT ISLAND
An tOileán Mór
COBH
An Cóbh
CORK HARBOUR
Cuan Chorcaí
RINGASKIDDY
Rinn an Scidigh
Whitegate
An Geata Bán
Cloyne
Cluain
Shanagarry
An Seangharraí
Ballycotton Bay
Bá Bhaile Choitín
Youghal Bay
Cuan Eochaille

Location Map



Key to Symbols

Legend

- Invasive Species
- Bat Survey Trees High Potential
- Bat Survey Trees Moderate Potential
- Route Identifier
- High Voltage Alternative Cable Route
- High Voltage Direct Cable Route
- ED2 Spoil and bare ground
- FW2 Rivers
- FW4 Drainage ditches
- GA2 Amenity grassland (improved)
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BC4 Flower beds and borders
- BL3 Building and artificial surfaces
- CD3 Fixed Dunes
- ED2 Spoil and bare ground
- ED3/GS1 Recolonising bare ground / Dry calcareous and neutral grassland mosaic
- FS1 Reed and large sedge swamps
- FW4 Drainage ditch
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS1 Dry Calcareous and Neutral Grassland
- GS2 Dry meadows and grassy verges
- GS4 Wet grassland
- LS2 Sand shores
- WD1 Broadleaved woodland
- WL2 Treeline
- WN2 Oak-ash-hazel woodland
- WS1 Scrub
- WS2 Immature woodland

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

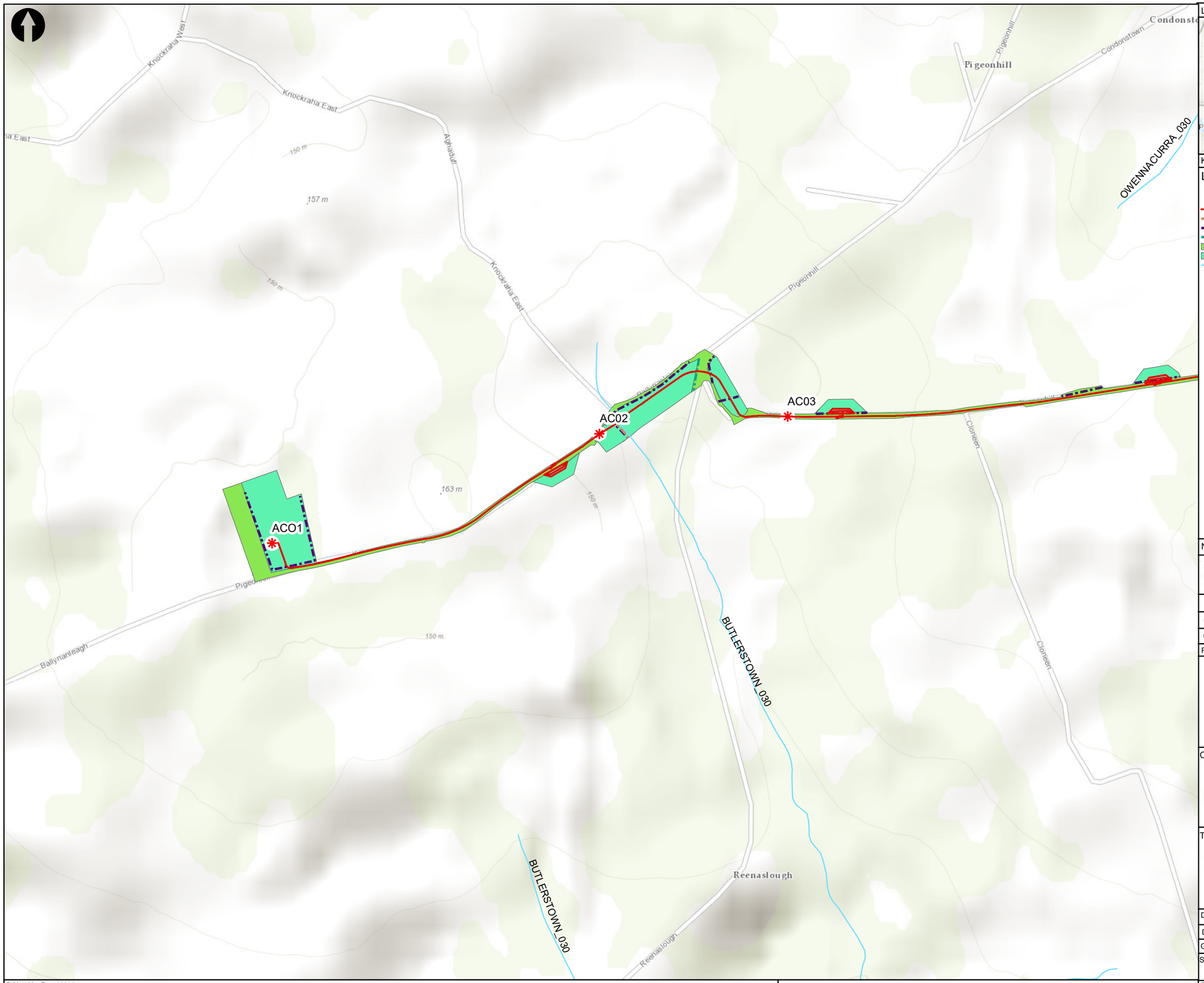
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

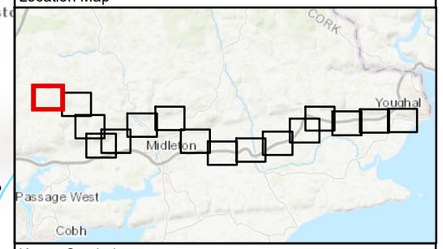
Scale at A3	Status	Rev	Security
1:100,000	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008

0 5 10 Km



Location Map



Key to Symbols

Legend

- Route Identifier
- High Voltage Alternative Cable Route
- FW2 Rivers
- WL1 Hedgerows
- WL2 Treeline
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD

South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID

EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

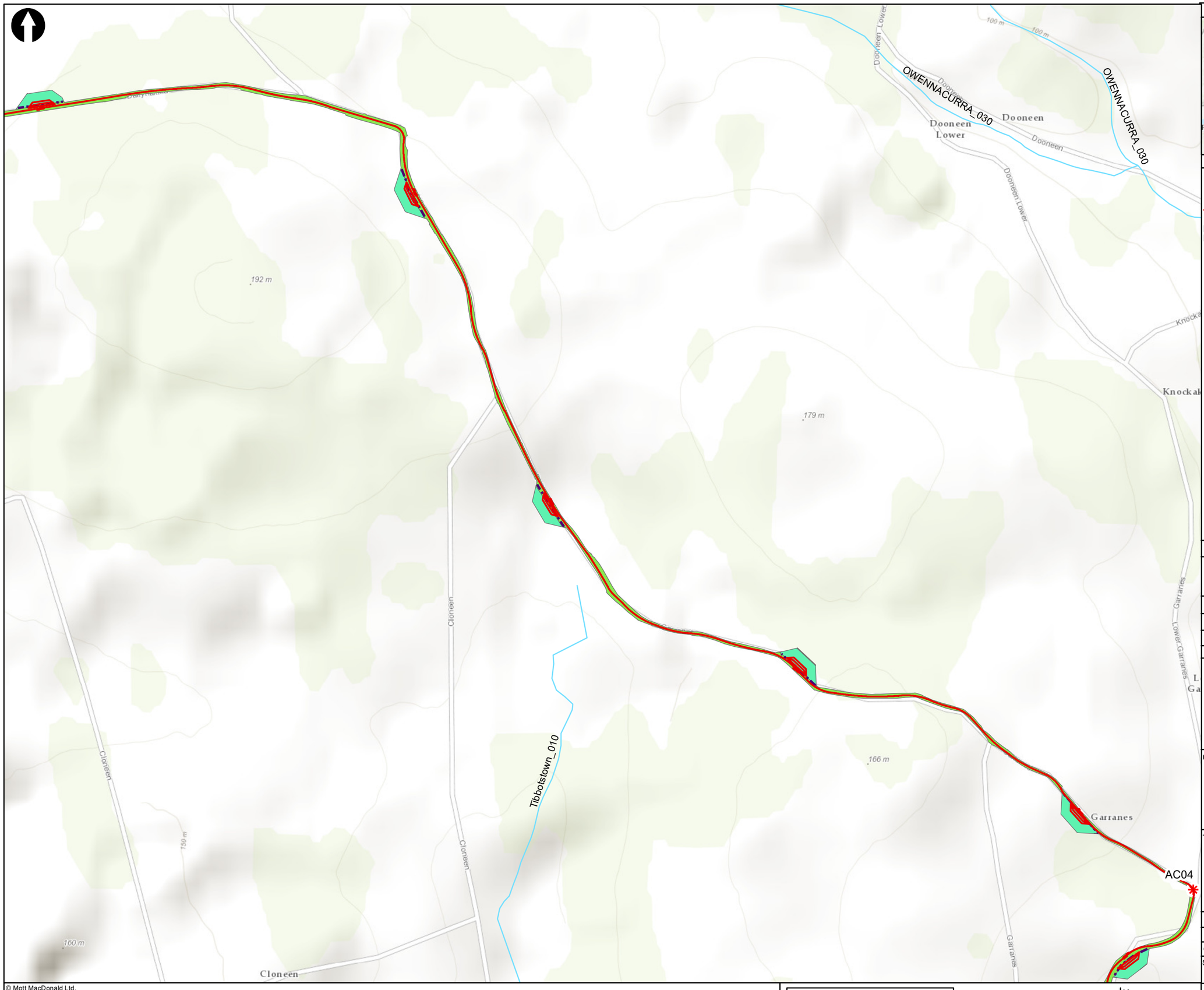
Page 1 of 16

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

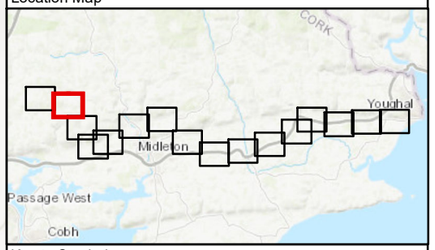
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-1

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Route Identifier
- High Voltage Alternative Cable Route
- WL1 Hedgerows
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

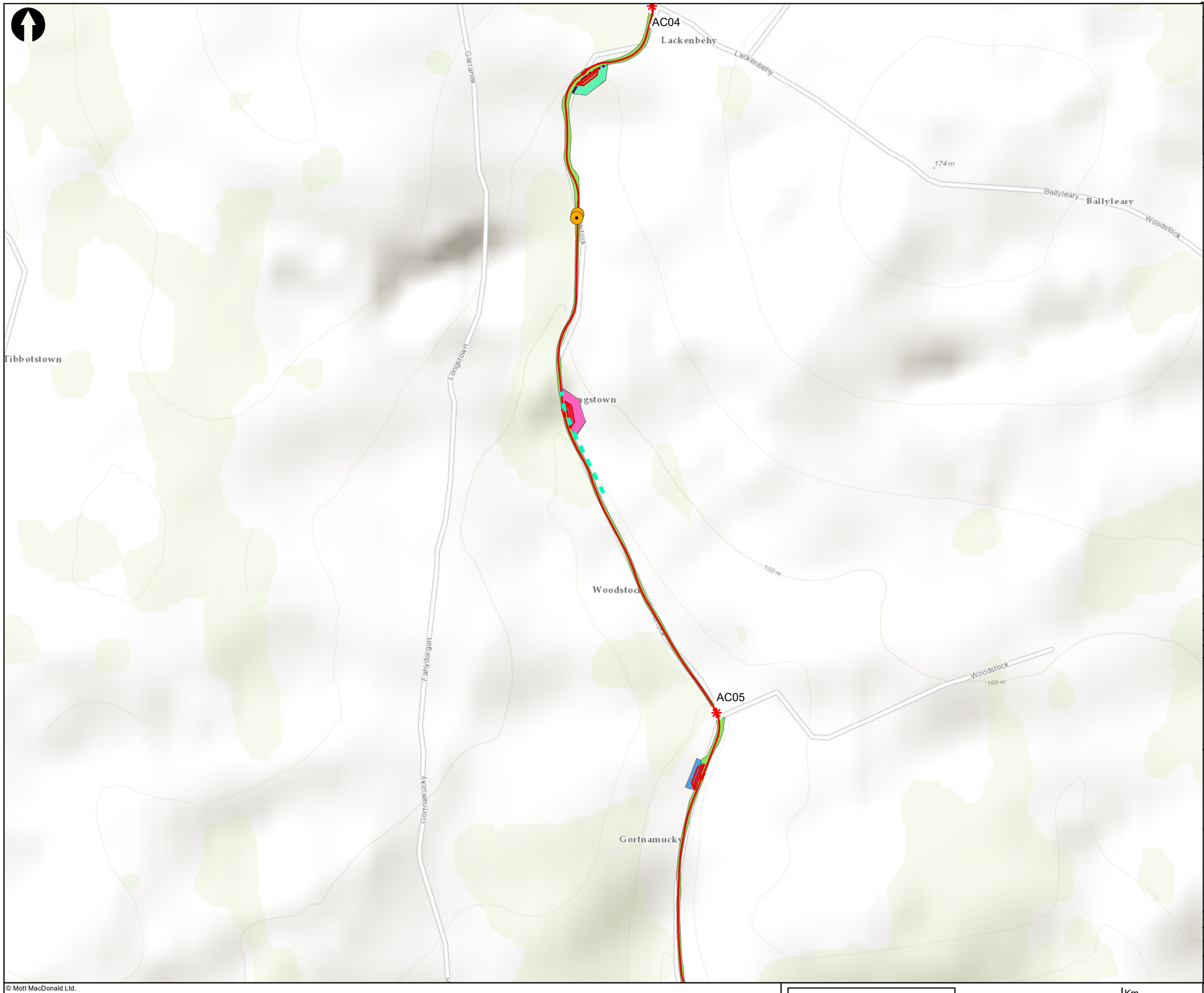
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

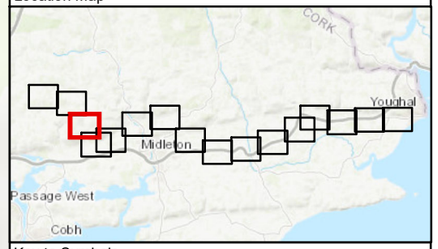
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-2

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Bat Survey Trees Moderate Potential
- Bat potential trees and features
- Route Identifier
- High Voltage Alternative Cable Route
- WL1 Hedgerows
- WL2 Treeline
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- WN2 Oak-ash-hazel woodland

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

Page 3 of 16

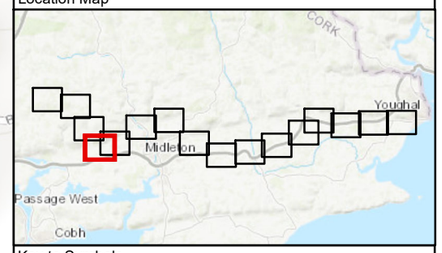
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-3

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Alternative Cable Route
- High Voltage Direct Cable Route
- ED2 Spoil and bare ground
- WL1 Hedgerows
- WL2 Treeline
- BL3 Building and artificial surfaces
- ED2 Spoil and bare ground
- ED3/GS1 Recolonising bare ground / Dry calcareous and neutral grassland mosaic
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS1 Dry Calcareous and Neutral Grassland
- GS4 Wet grassland
- WD1 Broadleaved woodland
- WS1 Scrub

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

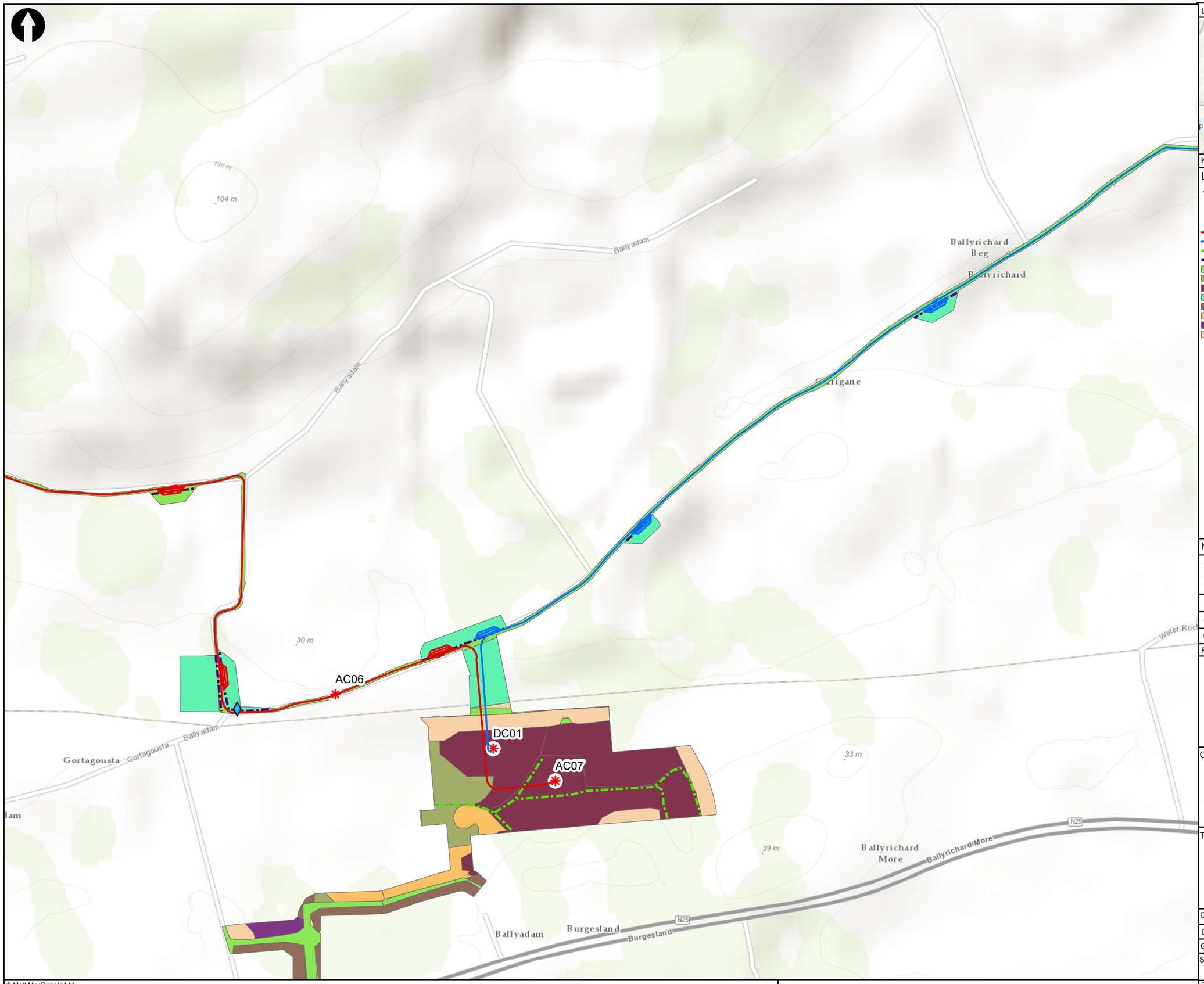
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

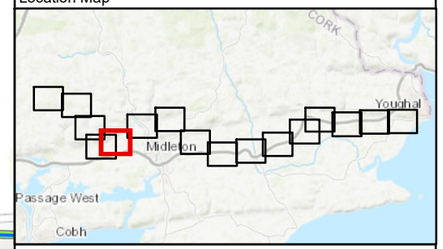
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-4

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Alternative Cable Route
- High Voltage Direct Cable Route
- ED2 Spoil and bare ground
- WL1 Hedgerows
- BL3 Building and artificial surfaces
- ED2 Spoil and bare ground
- ED3/GS1 Recolonising bare ground / Dry calcareous and neutral grassland mosaic
- GA1 Improved agricultural grassland
- GS1 Dry Calcareous and Neutral Grassland
- GS4 Wet grassland
- WD1 Broadleaved woodland
- WS1 Scrub

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

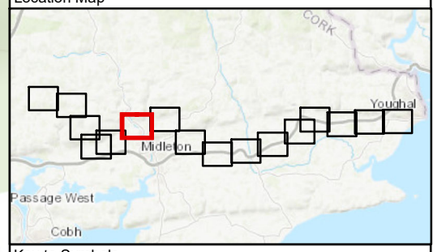
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-5

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Invasive Species
- Bat potential trees and features
- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS1 Dry Calcareous and Neutral Grassland
- GS4 Wet grassland
- WD1 Broadleaved woodland
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

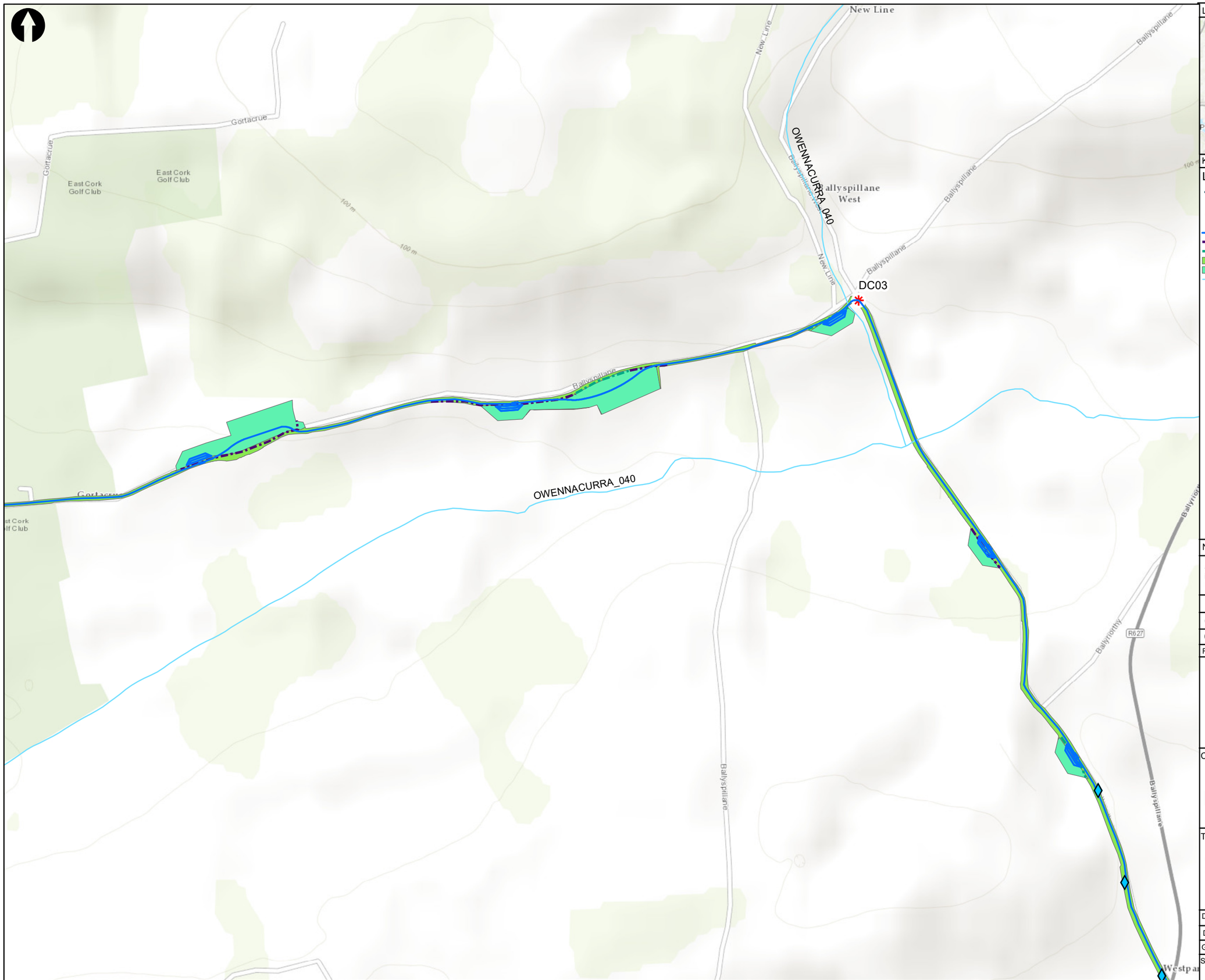
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

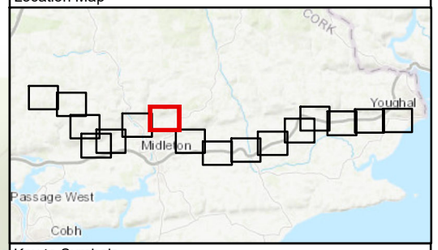
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-6

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Direct Cable Route
- WL1 Hedgerows
- WL2 Treeline
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD

South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID

EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

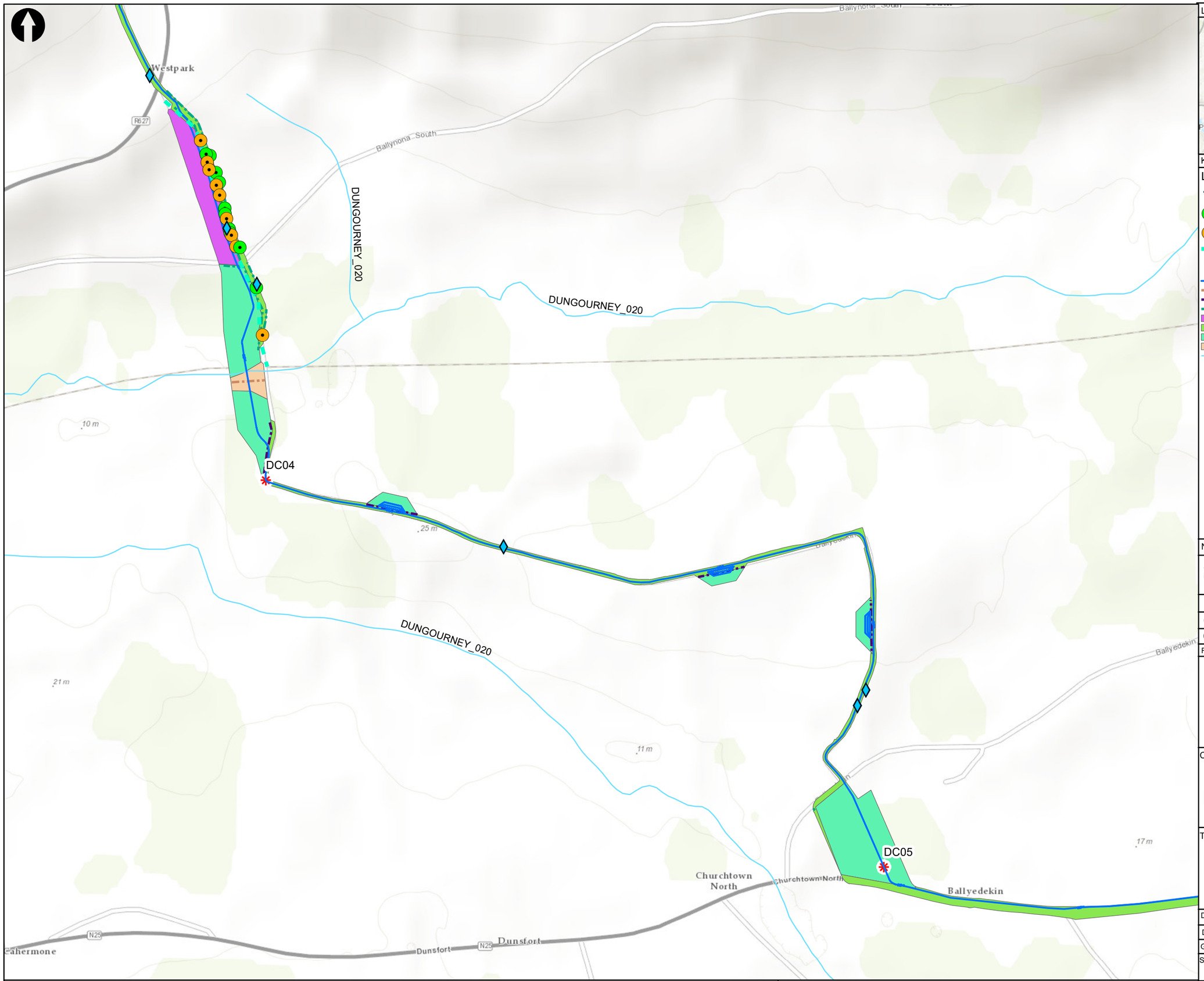
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

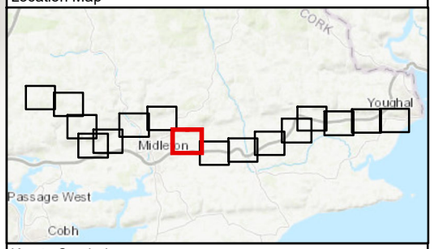
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-7

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Invasive Species
- Bat Survey Trees High Potential
- Bat Survey Trees Moderate Potential
- Bat potential trees and features
- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

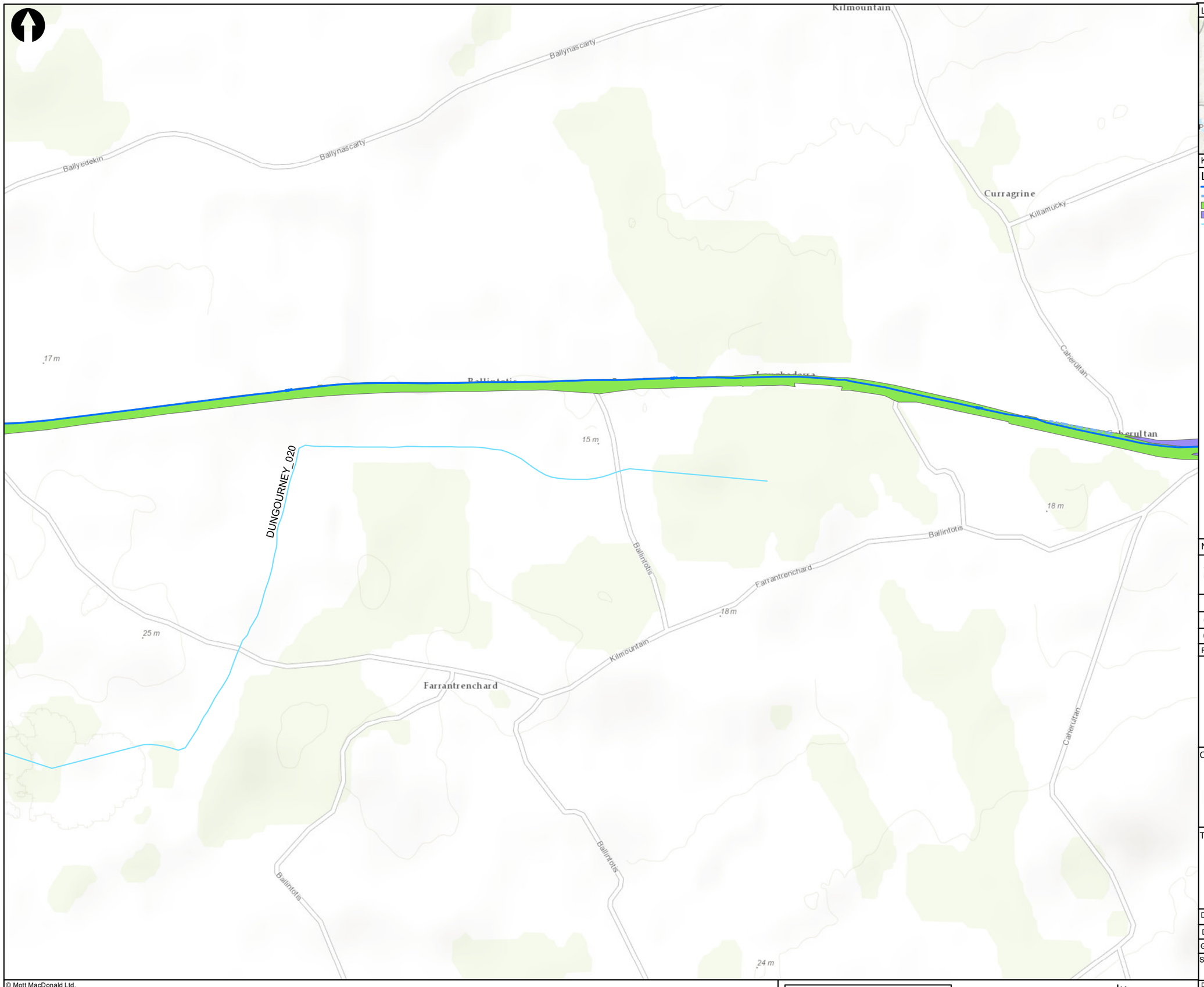
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

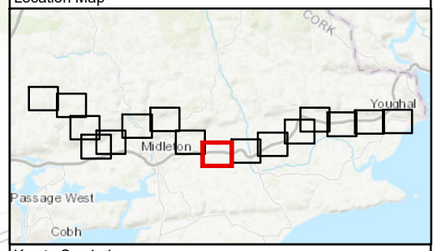
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-8

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- High Voltage Direct Cable Route
- GA2 Amenity grassland (improved)
- BL3 Building and artificial surfaces
- GS2 Dry meadows and grassy verges
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD

South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID

EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

Page 9 of 16

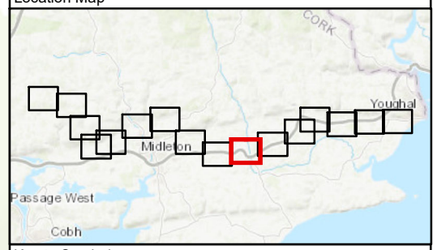
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-9

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Bat potential trees and features
- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BL3 Building and artificial surfaces
- FW4 Drainage ditch
- GA1 Improved agricultural grassland
- GS2 Dry meadows and grassy verges
- WD1 Broadleaved woodland
- WL2 Treelines
- WS1 Scrub
- WS2 Immature woodland
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

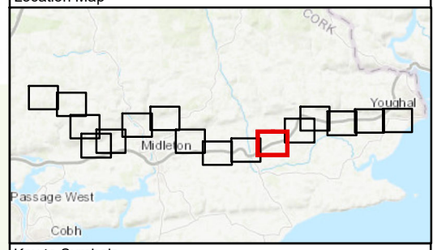
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-10

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- WL1 Hedgerows
- WL2 Treeline
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- GS2 Dry meadows and grassy verges
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

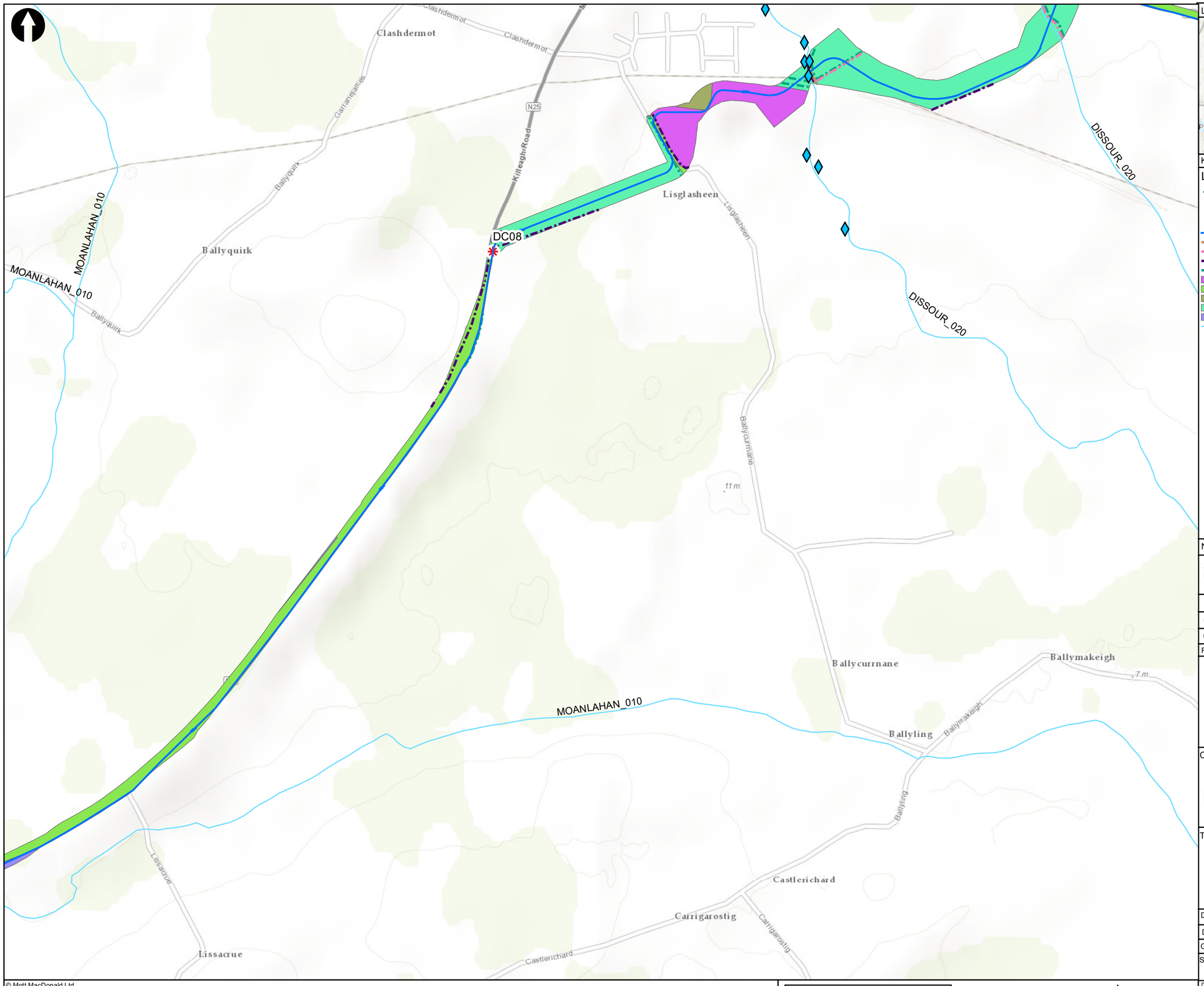
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

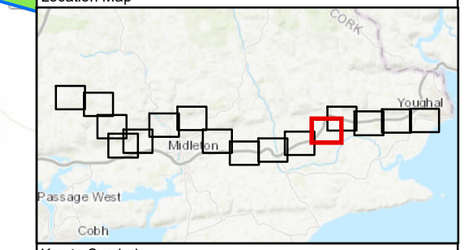
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-11

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- FW4 Drainage ditches
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BL3 Building and artificial surfaces
- ED2 Spoil and bare ground
- GA1 Improved agricultural grassland
- GS2 Dry meadows and grassy verges
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

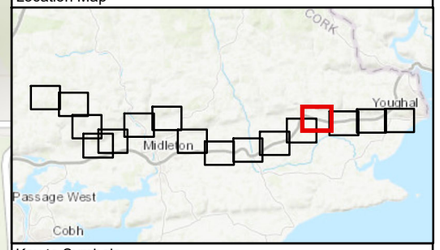
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-12

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Direct Cable Route
- FW2 Rivers
- FW4 Drainage ditches
- WL1 Hedgerows
- WL2 Treeline
- BC3 Tilled Land
- BL3 Building and artificial surfaces
- ED2 Spoil and bare ground
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS2 Dry meadows and grassy verges
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

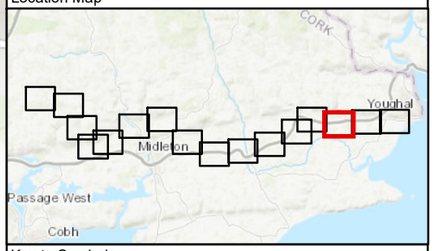
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-13

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- High Voltage Direct Cable Route
- WL2 Treeline
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS2 Dry meadows and grassy verges
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD

South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID

EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

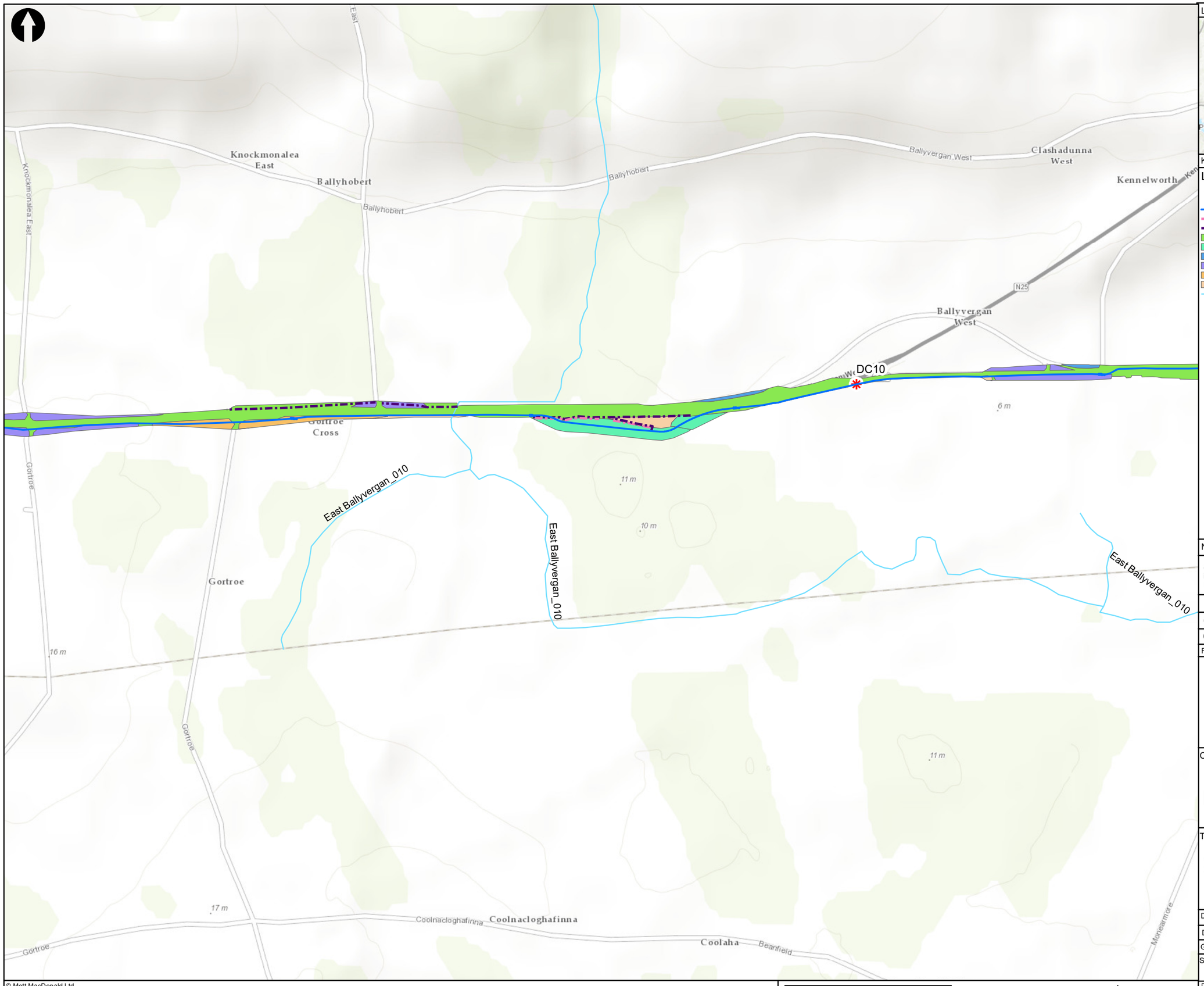
Celtic Interconnector Project
Step 4 Habitat Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

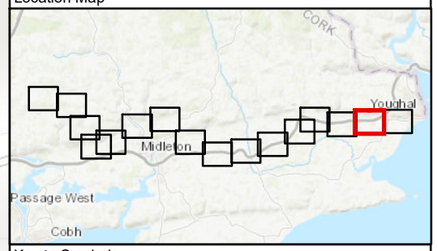
Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-14

0 0.35 0.7 Km



Location Map



Key to Symbols

Legend

- Route Identifier
- High Voltage Direct Cable Route
- FW4 Drainage ditches
- WL1 Hedgerows
- BL3 Building and artificial surfaces
- GA1 Improved agricultural grassland
- GA2 Amenity grassland (improved)
- GS2 Dry meadows and grassy verges
- GS4 Wet grassland
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

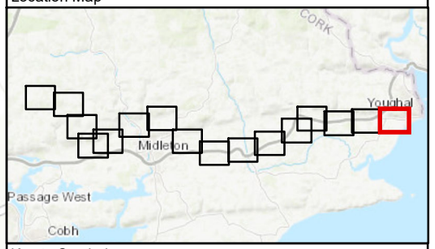
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-15

0 0.35 0.7 Km

Location Map



Key to Symbols

Legend

- Invasive Species
- Route Identifier
- High Voltage Direct Cable Route
- BC4 Flower beds and borders
- BL3 Building and artificial surfaces
- CD3 Fixed Dunes
- FS1 Reed and large sedge swamps
- GA2 Amenity grassland (improved)
- LS2 Sand shores
- WS1 Scrub
- River Network

Notes

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	17/06/21	ET	Overview Map	EJ	RM
00	04/02/21	ET	First Draft	EJ	RM

MOTT MACDONALD
South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID
EirGrid Plc
160 Shelbourne Road
Ballsbridge
Dublin 4 D04 FW28
Ireland

Title

Celtic Interconnector Project
Step 4 Habitat Overview Map

Page 16 of 16

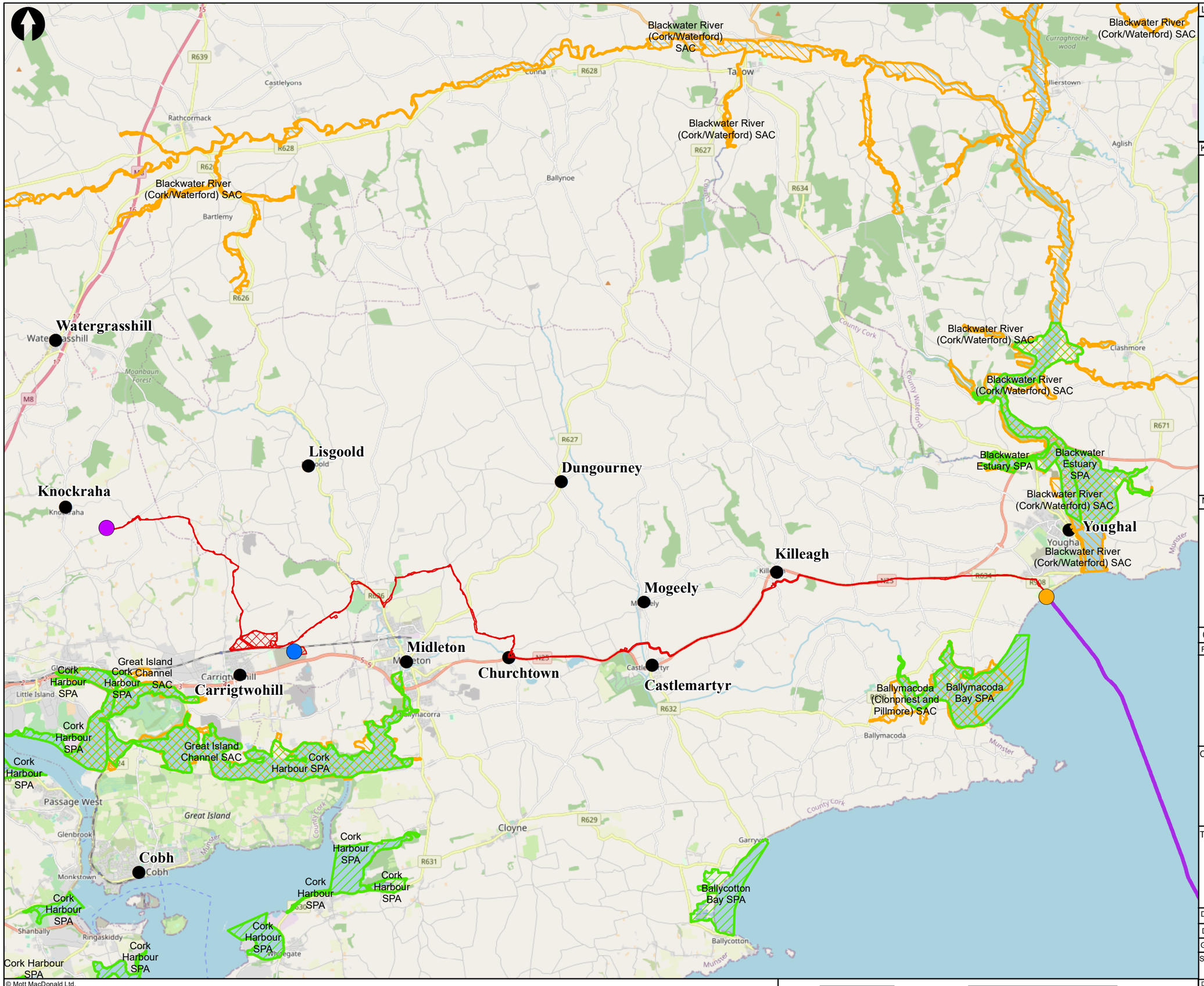
Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R Macnaughton	

Scale at A3	Status	Rev	Security
1:7,500	PRE	P2	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0008-16

0 0.35 0.7 Km

C. European Sites in Relation to The Proposed Development



Location Map

Key to Symbols

- Connection Point Knockraha
- Converter Station Site location (CSS1)
- Landfall Point
- Towns
- SPA
- SAC
- Red Line Boundary
- Offshore Cable Route

Notes

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Rev	Date	Drawn	Description	Ch'k'd	App'd
01	14/12/2020	ET	Best Performing Options	PC	EJ

MOTT MACDONALD

South Block
Rockfield, Dundrum
Dublin 16
D16 R6V0
Ireland
T +353 (0)1 291 6700
W www.mottmac.ie

Client

EIRGRID

Title

Celtic Interconnector
Natura Impact Statement

Overview Map

Designed	E Tiri		Eng Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	P Chambers		Approved	E Johnston	

Scale at A3	Status	Rev	Security
1:120,000	PRE	P1	STD

Drawing Number
229100428-MMD-00-XX-DR-N404-0006

0 2.5 5 10 Kilometers

D. Bird Survey Reports

GLAS ECOLOGY

WINTERING BIRDS AT TWO SITES IN EAST CORK

Prepared for Mott MacDonald

April 2019

Table of Contents

1 INTRODUCTION

Glas Ecology were commissioned by Mott MacDonald to undertake wintering bird surveys at two locations in East Cork:

- Redbarn/Claycastle
- Ballinwilling beach

Both locations are coastal sites and it is understood that these surveys will form part of the route selection process for a new Celtic Interconnector project, with landfall of the Interconnector being at one of these locations. It is also understood that these initial wintering bird surveys will form part of a suite of ornithological studies to further inform the route selection process.

Neither of these two sites located within a Natura 2000 site (Special Area of Conservation, SAC, or Special Protection Area, SPA), however the Redbarn/Claycastle area is adjacent to the Ballyvergan Marsh proposed Natural Heritage Area (pNHA). This is a site that has been designated as it is the largest coastal freshwater marsh in Co Cork, supporting a large of reedbed. In turn, this reedbed provides habitat for a population of Reed Warblers which at the time of designation was a sizeable proportion of the Irish population. Ballyvergan Marsh is also a traditional roost site for wintering Hen Harriers, a species listed under Annex I of the EU Birds Directive.

The surveys looked at three aspects of wintering birds:

- Usage of the shore by wintering waterbirds (to include waders and wildfowl).
- Usage of the adjacent inland fields by wintering waterbirds
- Watches for roosting Hen Harriers, at Redbarn/Claycastle only

This report presents the results of these initial wintering bird surveys.

2 SURVEY METHODOLGY

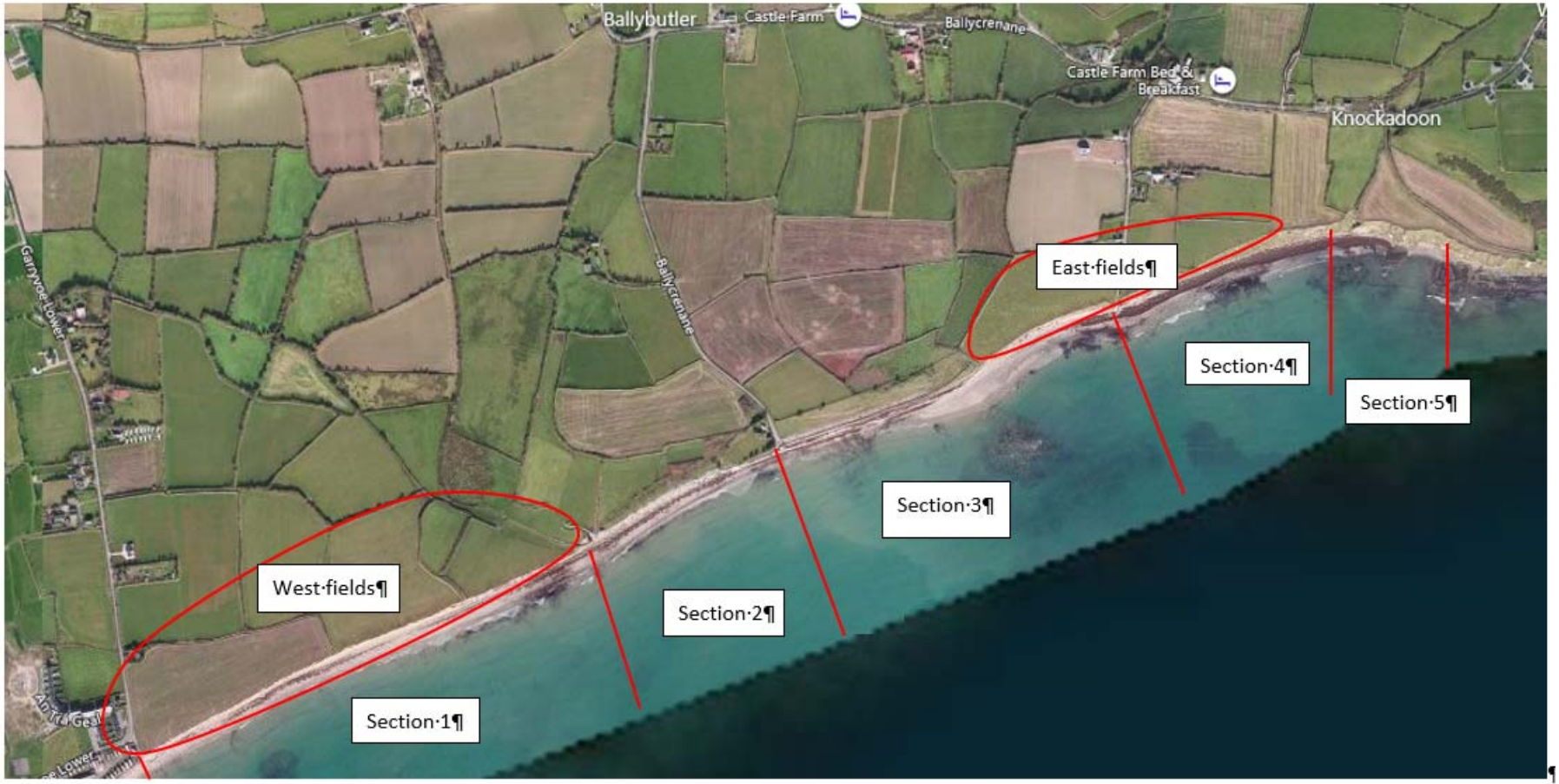
2.1 Wintering waterbirds

Surveys to determine the usage of the shore and the fields just to the inland of the shore follow the same methodology and therefore, both included in this section. The shorelines at both Redbarn/Claycastle and Ballinwilling beach were divided into five sections. Counts were then conducted at high and low tides, with counts of different bird species per section noted. At the same time, the species and numbers of birds using any of the adjacent inland fields were also recorded. As per the Irish Wetland Bird Survey (I-WeBS) methodology (Boland & Crowe, 2012), high tide counts were conducted at or near high tide. Low water counts were undertaken in the two-hour period either side of low water (Lewis & Tierney, 2014). Again, birds using the inland fields were also recorded during the low water counts. Figure 1 below shows the locations of the count sections for Redbarn/Claycastle, and Figure 2 shows the count sections at Ballinwilling beach. Both figures also show the locations of fields were bird were recorded at high tide.

High and low water counts are usually carried out to cover the entire period between September and March in order to provide a full picture of how wintering Waterbirds use a site. However, in this case work was not commissioned until February, so counts were conducted in February and March only.

Figure 1: Count sections for Redbarn/Claycastle

Figure 2: Count sections for Ballinwilling Beach



2.2 Hen Harrier roost counts

Hen Harrier roost counts were conducted at the Redbarn/Claycastle site, overlooking Ballyvergan Marsh. Roost watches were conducted from a Vantage Point in the sand dunes, at the western end of the car park, with watches being carried out from 1.5 hours before sunset to half an hour after sunset or until it became too dark to see (Gilbert *et al*, 1998).

3 Results

3.1 Wintering waterbirds

Counts were conducted at Redbarn/Claycastle on the 18th February and 4th March, 2019, with counts at Ballinwilling Beach on 20th February and 6th March, 2019. Weather conditions for all counts were acceptable except for the afternoon of 20th February when wind speeds increased to F5-6 and with heavy showers. However, this was for the high-water count when the tide covered virtually all of the shoreline with birds confined to the inland fields. The reduced visibility caused by the poor weather conditions did not impede collection of accurate data. The full survey schedule and weather conditions is given in Table 1 below

Table 1: Survey schedule and weather conditions

Site	Date	High or Low Water	Start time	End time	Wind	Rain	Cloud	Visibility
Redbarn/Claycastle	18/02/2019	Low	1050	1200	F4-5 W	Nil	3/8	Good
Redbarn/Claycastle	18/02/2019	High	1600	1655	F4 W	Nil	3/8	Good
Redbarn/Claycastle	04/03/2019	Low	1115	1220	F3 NW	Nil	7/8	Good
Redbarn/Claycastle	04/03/2019	High	1600	1650	F3 NW	Nil	3/8	Good
Ballinwilling	20/02/2019	Low	1300	1455	F4-5	Showers	8/8	OK
Ballinwilling	20/02/2019	High	1630	1725	F5-6	Occ heavy	8/8	OK - Poor
Ballinwilling	06/03/2019	Low	1240	1420	F4-5	Nil	8/8	Good
Ballinwilling	06/03/2019	Low	1700	1745	F4-5	Nil	3/8	Good

In total, 12 species of waders, wildfowl and gulls were recorded at Redbarn/Claycastle with 17 species recorded across the counts at Ballinwilling Beach. The peak counts (i.e. the maximum recorded over the two counts) for each of the species is presented in the tables below. The counts are given per count section and then totalled. Appendix 1 contains all field data gathered. Table 2 gives the peak

counts recorded at Redbarn/Claycastle at low water and Table 3 the peak counts for high water at Redbarn/Claycastle.

Table 2: Peak counts recorded during February and March at Redbarn/Claycastle at low water

Species	1	2	3	4	5	Fields	TOTAL
Grey Heron						1	1
Cormorant							0
Oystercatcher	11	5	2	12	13		43
Curlew	2					16	18
Bar-tailed Godwit	6						6
Sanderling	63	29		25			117
Redshank	1						1
Black-headed Gull		4	7	2	9		22
Common Gull	10	4		1	4		19
Great Black-backed Gull					8		8
Herring Gull	5	2	2	2	12		23
Lesser Black-backed Gull	1			4			5
TOTAL	**99**	**44**	**11**	**46**	**46**	**17**	

Table 3: Peak counts recorded during February and March at Redbarn/Claycastle at high water

Species	1	2	3	4	5	Fields	TOTAL
Grey Heron							0
Cormorant		1					1
Oystercatcher						14	14
Curlew						57	57
Bar-tailed Godwit							0
Sanderling							0
Redshank							0
Black-headed Gull					4		4
Common Gull				4	10		14
Great Black-backed Gull							0
Herring Gull							0
Lesser Black-backed Gull							0
TOTAL	**0**	**1**	**0**	**4**	**14**	**71**	

Table 4 gives the peak counts at low water for Ballinwilling Beach, with Table 5 giving the high-water peak counts.

Table 4: Peak counts recorded during February and March at Ballinwilling Beach at low water

Species	1	2	3	4	5	West fields	East fields	TOTAL
Brent Goose					2			2
Cormorant			1					1
Oystercatcher		3	15	29	15		63	125
Golden Plover								0
Grey Plover	1		2					3
Ringed Plover		8	9	2				19
Curlew			3		5	52	28	88
Turnstone			38	22				60
Sanderling	21	36	61					118
Dunlin			9					9
Redshank				2	9			11
Greenshank					1			1
Black-headed Gull	6	4	7	160	3			180
Common Gull	4	6	3	4				17
Great Black-backed Gull		6			1			7
Herring Gull		16	1	4	9			30
Lesser Black-backed Gull		4						4
Gulls								0
TOTAL	**32**	**83**	**149**	**223**	**45**	**52**	**91**	

Table 5: Peak counts recorded during February and March at Ballinwilling Beach at high water

Species	1	2	3	4	5	West fields	East fields	TOTAL
Brent Goose								0
Cormorant								0
Oystercatcher			13				36	49
Golden Plover						267		267
Grey Plover								0
Ringed Plover						38		38
Curlew						8	30	38
Turnstone								0
Sanderling		50	90					140
Dunlin			12			15		27
Redshank			1					1
Greenshank								0
Black-headed Gull							150	150
Common Gull								0
Great Black-backed Gull								0
Herring Gull								0
Lesser Black-backed Gull								0
Gulls				300				300
TOTAL	**0**	**50**	**116**	**300**	**0**	**328**	**216**	

At Redbarn/Claycastle, the count section holding the highest numbers of birds at low water was section 1, the easternmost section. Count sections 2, 4 and 5 all held similar numbers at low water. At high water, the fields were the most important area for birds, with very few birds recorded in the other count sections. At low water, Sanderling numbers were highest followed by Oystercatcher and three gull species. At high water, Curlew was the species with the highest numbers recorded, followed by Oystercatcher and Common Gull.

At Ballinwilling Beach, the count section holding most birds at low water was section 4, and then section 3. At high water, the two field sections held high numbers along with section 4, although the high count in section 4 was due entirely to a flock of mixed gull species that were feeding on kelp on the strandline.

These results are discussed further in Section 4 below.

3.2 Wintering Hen Harrier

Two roost watches at Ballyvergan were conducted on 18th February and 4th March, 2019. On both dates, weather conditions were suitable for undertaking the roost watches.

On both dates, 'ringtail' Hen Harriers were seen to go to roost in the reedbed. (Ringtail is a generic term for female and immature males as they can only be distinguished with close views). On 18th February, two ringtails were seen going to roost whilst only a single bird was seen. On both occasions, the birds went to roost in a similar location [redacted]. Also notable was the presence of a Merlin on the 4th March. This bird was seen hunting the edge of the marsh, just inland of the beach.

4 DISCUSSION

4.1 Redbarn/Claycastle

In general, numbers of wintering waterbirds recorded at Redbarn/Claycastle were low, particularly at high tide. At high tide, it was noticeable that the high-water level reached to the foot of the sand dunes and the coastal walkway, meaning that there is very little habitat available for birds to roost at high water. This is coupled with the fact that the area is very popular with walkers and dog walkers. The main walkways are along the dunes and also along a boardwalk and the walkway towards the eastern, Claycastle end. This leads to high levels of disturbance that would also deter birds from roosting along the edge of the shore line. At low water, Sanderling was the species recorded in the highest numbers. This small wading bird is a highly mobile species that is seen scurrying along the edge of the waterline picking at debris washed up the constantly moving drift line. Although count section 1 held the highest numbers of Sanderling, this species is likely to move constantly along the beach in search of food. The beach below the high-water level is relatively uniform for its length, with no features (such as rock outcrops or areas of seaweed) that could potentially influence bird distribution.

Table 6 below shows the highest numbers of each species (at either high or low water) and also gives the estimates of the all-Ireland wintering populations of each species, along with the figure where the numbers would qualify as being of national significance. The colour coding refers to 'Birds of Conservation Concern in Ireland' (Colhoun & Cummins 2013), where species are included in either red or amber lists to highlight concern about their populations.

Table 6: Peak numbers recorded during survey work, compared with All-Ireland populations and figures of national significance

Species	Peak number recorded	All- Ireland population	Figure of national significance
Grey Heron	1	1,173*	105
Cormorant	1	10,870*	110
Oystercatcher	43	60,540*	610
Curlew	57	35,240*	350
Bar-tailed Godwit	6	16,530*	170
Sanderling	117	8,420*	85
Redshank	1	23,800*	240
Black-headed Gull	22	50,162	1,000
Common Gull	19	18,050	500
Great Black-backed Gull	8	2,946	500
Herring Gull	23	13,953	500
Lesser Black-backed Gull	5	13,109	500

*Figures taken from Burke *et al*, 2019, all other figures taken from Crowe, 2005.

Table 6 shows that four species that are red listed under Birds of Conservation Concern in Ireland (BoCCI) were recorded. However, all of these, with the exception of Curlew, are red listed as result of a decrease in their breeding populations. Curlew is red listed due to a decline in breeding and wintering populations. Only numbers of Sanderling exceeded the figure for national significance. However, figures of national significance are calculated from the peak figures recorded over a five-year period and the figures recorded at Claycastle/Redbarn are from two months' survey work only.

Up to two roosting Hen Harriers were recorded using the Ballyvergan Marsh. This confirms that this site continues to be an important roost area for this species. Hen Harrier is amber listed under BoCCI but is also an Annex I species under the EU Birds Directive.

4.2 Ballinwilling Beach

As with the Redbarn/Claycastle area, in general, numbers of wintering waterbirds recorded at Ballinwilling Beach were low, particularly at high tide. At high tide, it was again noticeable that the high-water level reached to the foot of the sand dunes or foot of the low sand cliffs, meaning that there is very little habitat available for birds to roost at high water. Levels of disturbance from walkers is much lower than at Redbarn/Claycastle and appears to be mostly at times other than high water as there is no walkway at high water.

The fields were important areas at high water for a number of species, with smaller waders (Golden Plover, Dunlin and Ringed Plover) favouring a ploughed field at the western end of the site, and larger waders (Curlew and Oystercatcher) preferring the grass fields towards the eastern end. Count section 4 also held good numbers of birds. This section includes areas of seaweed covered rocks that would

provide additional feeding habitat for waterbirds. The shape of the bay for sections 3 and 4 also means that kelp tends to gather in these areas, providing excellent feeding areas for birds.

Table 7 below shows the highest numbers of each species (at either high or low water) and also gives the estimates of the all-Ireland wintering populations of each species, along with the figure where the numbers would qualify as being of national significance. The colour coding refers to 'Birds of Conservation Concern in Ireland' (Colhoun & Cummins 2013), where species are included in either red or amber lists to highlight concern about their populations.

Table 7: Peak numbers recorded during survey work, compared with All-Ireland populations and figures of national significance

Species	Peak number recorded	All- Ireland population	Figure of national significance
Brent Goose	2	*35,150	350
Cormorant	1	*10,870	110
Oystercatcher	125	*60,540	610
Golden Plover	267	*92,060	920
Grey Plover	3	*2,940	30
Ringed Plover	38	*11,660	120
Curlew	88	*35,240	350
Turnstone	60	*9,480	95
Sanderling	140	*8,420	85
Dunlin	27	*45,760	460
Redshank	11	*23,800	240
Greenshank	1	*1,320	20
Black-headed Gull	180	50,162	1,000
Common Gull	17	18,050	500
Great Black-backed Gull	7	2,946	500
Herring Gull	30	13,953	500
Lesser Black-backed Gull	4	13,109	500

*Figures taken from Burke *et al*, 2019, all other figures taken from Crowe, 2005.

Six species recorded at Ballinwilling Beach are red listed on the BoCCI. Curlew, Dunlin and Golden Plover are red listed due to declines in breeding and wintering populations, with the other species red listed due to declines in breeding populations only. As with Redbarn/Claycastle, only Sanderling numbers reached national significance, but again this is only from counts in two months, February and March, 2019.

5 SUMMARY

At both Ballinwilling Beach and Redbarn/Claycastle, generally numbers of wintering waterbirds were low. The exception to this is Sanderling were numbers reached national significance at both sites. At Redbarn/Claycastle, the uniformity of the beach is likely to mean that no section in particular is likely to be favoured by birds. Count section 1 did hold most birds but this skewed by the presence of a flock of Sanderling. As previously mentioned, this is a highly mobile species that is likely to use all parts of the beach. At Ballinwilling Beach, count section 4 was favoured by birds, with the presence of the seaweed covered rocks influencing this. At both sites, the field areas did hold numbers of birds at high tide. It is strongly recommended that a full winter's survey is carried out to confirm the initial conclusions that the two areas hold low numbers of birds, with the key waterbird species being Sanderling.

The continued presence of roosting Hen Harriers in Ballyvergan Marsh is of significance and the route of the Interconnector should be chosen to avoid disturbance to this area.

6 REFERENCES

Boland H and Crowe O. 2012. Irish Wetland Bird Survey: Waterbird Status and Distribution 2001/02 – 2008/09. Birdwatch Ireland.

Burke B, Lewis L. J, Fitzgerald N, Frost T, Austin G. and Tierney T. D. (2019). Estimates of waterbird numbers wintering in Ireland 2011/12 – 2015/16. Irish Birds 41: 1-12

Colhoun K and Cummins S (2013), "Birds of Conservation Concern in Ireland 2014 –2019". Irish Birds 9: 523—544

Crowe O. (2005) Ireland's Wetlands and their Waterbirds: Status and Distribution. Birdwatch Ireland

Gilbert G, Gibbons D. W. and Evans J. (1998). Bird Monitoring Methods, a manual of techniques for key UK species. RSPB

Lewis, L. J. and Tierney, T. D. (2014) Low tide waterbird surveys: survey methods and guidance notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

APPENDIX 1

Field data recorded at Redbarn/Claycastle and Ballinwilling Beach, February and March 2019

REDBARN/CLAYCASTLE

LOW WATER

Species	**1**	**2**	**3**	**4**	**5**	**Fields**	**TOTAL**	**1**	**2**	**3**	**4**	**5**	**Fields**	**Total**
Grey Heron						1	1							0
Cormorant							0							0
Oystercatcher	1	5	2	12	9		29	11		2		13		26
Curlew	2						2						16	16
Bar-tailed Godwit							0	6						6
Sanderling		29					29	63			25			88
Redshank	1						1							0
Black-headed Gull		4	7	2	9		22							0
Common Gull		4			3		7	10			1	4		15
Great Black-backed Gull					8		8							0
Herring Gull		1		5	5		11	5	2	2	2	12		23
Lesser Black-backed Gull				4			4	1						1

HIGH WATER

	18/02/2019							04/03/2019						
Species	**1**	**2**	**3**	**4**	**5**	**Fields**	**TOTAL**	**1**	**2**	**3**	**4**	**5**	**Fields**	**Total**
Grey Heron							0							0
Cormorant		1					1							0
Oystercatcher						6	6						14	14
Curlew						57	57						22	22
Bar-tailed Godwit							0							0
Sanderling							0							0
Redshank							0							0
Black-headed Gull					4		4							0
Common Gull				4	10		14							0
Great Black-backed Gull							0							0
Herring Gull							0							0
Lesser Black-backed Gull							0							0

BALLINWILLING BEACH

LOW WATER

	20/02/2019								06/03/2019							
Species	**1**	**2**	**3**	**4**	**5**	**West fields**	**East fields**	**TOTAL**	**1**	**2**	**3**	**4**	**5**	**West fields**	**East fields**	**Total**
Brent Goose					2			2								0
Grey Heron								0								0
Cormorant			1					1			1					1
Oystercatcher		3	15	26	15		63	122			3	29	9			41
Golden Plover								0								0
Grey Plover	1							1			2					2
Ringed Plover			1					1		8	9	2				19
Curlew			3		4	52	28	87					5		21	26
Bar-tailed Godwit								0								0
Turnstone			38	14				52			12	22				34
Sanderling			3					3	21	36	61					118
Dunlin								0			9					9
Redshank					2			2				2	9			11
Greenshank								0					1			1
Black-headed Gull	6	4	7	160	3			180					1			1
Common Gull	4	1	3	4				12	4	6						10
Great Black-backed Gull		6						6					1			1
Herring Gull		16		4	6			26		5	1		9			15
Lesser Black-backed Gull		4						4								0
Gulls								0								0

HIGH WATER

	20/02/2019								06/03/2019							
Species	**1**	**2**	**3**	**4**	**5**	**West fields**	**East fields**	**TOTAL**	**1**	**2**	**3**	**4**	**5**	**West fields**	**East fields**	**Total**
Brent Goose								0								0
Grey Heron								0								0
Cormorant								0								0
Oystercatcher			13					13							36	36
Golden Plover						133		133						267		267
Grey Plover								0								0
Ringed Plover						38		38			3			23		26
Curlew						8		8							30	30
Bar-tailed Godwit								0								0
Turnstone								0								0
Sanderling		50						50			90					90
Dunlin						9		9			12			15		27
Redshank								0			1					1
Greenshank								0								0
Black-headed Gull							150	150								0
Common Gull								0								0
Great Black-backed Gull								0								0
Herring Gull								0								0
Lesser Black-backed Gull								0								0
Gulls				300				300								0

Winter Bird Surveys at Four Sites in East Cork November-March 2019/20

Light-bellied Brent Geese at Ballinwilling

Prepared for Mott MacDonald

By

Tony Nagle BSc MSc

Contents

Introduction

Tony Nagle was commissioned by Mott MacDonald to undertake winter bird surveys at five predetermined sites in East Cork during the winter of 2019-20 as part of the site selection process for the Celtic Interconnector undersea cable link between Ireland and France. Two coastal sites (Ballinwilling and Redbarn-Claycastle) are currently being assessed for their suitability as the pipeline entry point and two of the inland sites (Ballyadam and Kilquane) are being assessed for their suitability as the location for a new electricity sub-station. The fifth site, Ballyvergan Marsh, may require some pipe-laying at the eastern extremity.

None of the five surveyed sites is located within a Natura 2000 site i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA). Ballinwilling Beach is bordered to the southwest by Ballycotton Bay SPA and much of the western shoreline lies within Ballycotton, Ballinamona and Shanagarry proposed National Heritage Area (pNHA). Redbarn Beach is bordered to the south by Ballymacoda Bay SPA (Site Code 004023) and Ballymacoda (Clonpriest and Pilmore) SAC (Site Code 000077) and Ballymacoda Bay pNHA (Site Code 000077) are situated approximately 1.33 km southwest of the survey area. The Blackwater River SAC (Site Code 002170) is situated approximately 700 metres northeast of Claycastle Beach. The coastal sites in the vicinity of Youghal (Claycastle and Redbarn) are adjacent to Ballyvergan Marsh pNHA (Site Code 000078). Part of Ballycotton, Ballinamona and Shanagarry pNHA was included in the surveys conducted at Ballinwilling and part of Ballyvergan pNHA was included in the surveys conducted at Claycastle and Redbarn.

All of the surveys were took place between November 2019 and March 2020 (apart from line transect surveys at Ballyadam and Kilquane which took place between December2019 and March 2020). Each of the sites had been assessed and surveyed during the spring and summer of 2019 so no pre-survey assessment was required.

High water and low water counts were undertaken at Ballinwilling and Redbarn-Claycastle each month and timing of visits at these two sites was subject to days when both high water and low water counts could be undertaken on the same day. The marine bird survey at Claycastle was subject to similar timing conditions. Line transect surveys at Ballyadam and Kilquane were undertaken in the morning or early afternoon. Hen Harrier winter roost/nocturnal surveys took place an hour before sunset until dusk. All of the surveys were conducted in suitable weather conditions (good visibility, little or no rain and winds no stronger than Beaufort force 4) apart from two of the five marine bird surveys at Claycastle where surveys were carried out in stronger winds to assess the effect of wind on bird movements at this site.

Survey Methodology

Wetland Bird Surveys

Wetland bird surveys were carried out at Ballinwilling and Redbarn-Claycastle. Both sites were sub-divided into 5 sections. Nearby fields that were also used by some species were included in the counts and wetland birds seen in Ballyvergan Marsh were included in the Redbarn-Claycastle surveys. Using IWeBS methodology, bird counts were carried out within two hours either side of high tide. To gain a better understanding of bird usage at these sites, low-water counts were also conducted at both sites within a two hour period either side of low water (Lewis & Tierney, 2014) Normally these surveys would commence in September but work was not commissioned until November so these surveys commenced in November 2019 and ended in March 2020. Figure 1 below shows the locations of the count sections for Redbarn/Claycastle, and Figure 2 shows the count sections at Ballinwilling beach. Both figures also show the locations of fields where birds (mostly Curlew) were recorded.

Marine Bird Surveys

Marine bird surveys were undertaken at Claycastle each month between November and March. This survey consisted of three hour-long dedicated counts of all seabirds recorded using or passing through the site of the proposed landfall (should it be chosen) at high tide, mid-tide and low-tide. (See Appendix 3).

Line Transect Bird Surveys

Line-transect bird surveys were carried out at four of the five sites. The surveys were based on the British Trust for Ornithology English Winter Bird Survey Guidelines (BTO 2019). These surveys normally involve two visits during the breeding season (one in the early part of the season and one in the later part) but given that much larger numbers of waterbirds occur in the winter period than in the summer period it was decided to undertake monthly transect surveys at each of the sites to determine usage. Most visits were undertaken in the morning between 6.20 am and 10.30 am. Defined transects were walked on each occasion and all birds seen and heard within the survey zone were recorded.

Hen Harrier Winter Roost and Nocturnal Bird Surveys

Nocturnal surveys were carried out in late evening at the four woodland sites to detect the presence of species that are largely nocturnal (Long-eared Owl) or crepuscular (Woodcock) or more active at these times (Snipe and Grasshopper Warbler). One nocturnal survey was also undertaken at Ballyvergan Marsh. Survey methodology followed that recommended by the British Trust for Ornithology (Heward *et al* 2013). This survey involved four visits to each site between April and the end of June. The first visit was used to identify a suitable spot to locate the count point and the following three visits involved being in position at the count point for 75 minutes, beginning 15 minutes before sunset and finishing 60 minutes after sunset.

Description of sites

Figure 1. Ballinwilling Beach showing the five count sections and fields surveyed during the winter bird surveys.

Ballinwilling Beach is a long sandy beach that stretches for over 2 km linking Garryvoe Beach on the west side and bounded by a rocky shore at Knockadoon to the east. Narrow stretches of dune separate the beach from an intensively farmed landscape (pasture and tillage). There are several small areas of cobble and shingle close to the car-park and two small areas of coastal marsh occur on either side of the car-park. Ballycotton Bay SPA bounds the western end of the beach and Ballycotton, Ballynamona and Shanagarry pNHA stretches from Shanagarry in the southwest across a large part of the western half of the beach (see Fig. 1). Ballinwilling Beach is popular with walkers, swimmers and runners etc. but most activities tend to be concentrated within approximately 500 m of the car-park and there is considerably less human activity beyond the vicinity of the car-park on both the eastern and western sides of the beach.

Figure 2 Redbarn-Claycastle Beach showing Ballyvergan and the five count sections and fields surveyed during the winter bird surveys. The marine bird survey area is shown in yellow.

Redbarn-Claycastle Beach forms part of an extensive length of sandy coastline that stretches from Youghal in the north to Pilmore in the south. Narrow stretches of dune merge into a strip of coastal heath that adjoins intensively farmed land on the on the south side of a busy hotel complex. The beach borders Ballymacoda Bay SPA on the southern side and Ballyvergan Marsh pNHA on the northern side. Redbarn Beach also adjoins a series of reclaimed fields that once formed part of Ballyvergan Marsh. These fields contain an interesting mosaic of wet grassland in the wetter areas close to the drains. Redbarn is a very popular venue for beach activities throughout the year. Claycastle Beach is the northern extremity of a long sandy coastline that stretches south to Ballymacoda Bay. The beach has a narrow strip of transitional dune that has been heavily modified in places to accommodate development such as caravan parks, car-parks and boardwalks. The transitional dune merges into fixed dune before adjoining the reed swamp of Ballyvergan Marsh. Ballyvergan is the largest area of coastal marsh in County Cork and it also contains one of the largest reedbeds in the country. Common Reed swamp is the predominant habitat within the marsh and this habitat supports a number of specialist bird species that are adapted to life among the reeds such as Water Rail, Sedge Warbler, Reed Warbler and Reed Bunting. Ballyvergan is of national importance for its population of the scarce but increasing Reed Warbler.

Figure 3. Ballyadam showing the exposed limestone areas, grassland, scrub, woodland and the winter bird survey transect (red line).

Ballyadam is a 56 hectare site that has been partially developed for industrial use. The site was formerly prime agricultural land but large areas of topsoil have been removed in the northern half exposing the limestone bedrock. The site has remained vacant for more than 10 years and a number of interesting habitats have formed including dry calcareous grassland, wet grassland and small areas of marsh. Three woodland areas occur and willow scrub is widespread. This interesting mix of habitats combines to produce an area rich in plant, invertebrate and bird species.

Figure 4. Kilquane Forest showing the surrounding farmland and the winter bird survey transect (red line). The vantage point used for Hen Harrier and Woodcock surveys is also shown.

Kilquane Forest is a moderately large conifer plantation of 67 hectares dominated by Sitka Spruce and Lodgepole Pine. The forest contains an interesting mix of growth stages that varies from newly planted areas, to post-thicket and mature stands. There is a ground layer of mosses, ferns and occasional bramble in the mature sections. The track used for the transect surveys is quite broad (8-10 m) with Grey Willow, Eared Willow and Gorse frequent on both sides. Hazel is common and other species such as Oak, Hawthorn, Beech, Ash, Sycamore and Holly occur occasionally along the track.

Results

Wetland Bird Surveys

Ballinwilling

High and low tide counts were conducted at Ballinwilling from November to March (see Table 1 and Table 2 below). A total of 22 species was recorded over this period. On two of the five counts (November and January) significantly larger numbers of birds were recorded during high tide counts. Numbers of birds seen on high and low tide counts in December were very similar but marginally higher numbers were recorded during low tide counts in February and March. The highest numbers of birds recorded during the high tide counts were seen in November, January and February whereas the highest low tide numbers were recorded in December and February.

Table 1 High tide counts at Ballinwilling (beach, sea and fields) from November to March.

Ballinwilling	**High Tide**				
Species	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**	**Mar-20**
Brent Goose			10		
Mallard					2
Common Scoter			1		
Great Northern Diver	9		3	1	3
Cormorant			2		1
Shag			1		1
Grey Heron	1	1	1		
Oystercatcher	44	48	11	126	1
Ringed Plover	14	40			3
Grey Plover		3		4	
Sanderling	13	1	14	3	
Turnstone	3	9	5	26	25
Redshank			1	2	
Greenshank			1		
Curlew	54	22	29	67	14
Whimbrel	1				
Black-headed Gull	38	8	16	13	
Common Gull	16	7	88	15	
Herring Gull	27	2	35	6	1
Great Black-backed Gull	3	5			
	223	146	218	263	51

Oystercatcher was the most frequently recorded species during both sets of counts (averaging 46 sightings in the high tide period and 44.2 in the low tide periods with peaks of 126 and 82). Other commonly recorded species include Curlew (averaging 37.2 in the high tide period and 43.6 in the low tide period) and Herring Gull (averaging 14.2 and 19.8). Several species were recorded only on

single occasions: Common Scoter, Greenshank, Whimbrel (high tide) and Red-throated Diver, Little Egret and Glaucous Gull (low tide).

Table 2 Low tide counts at Ballinwilling (beach, sea and fields) from November to March.

Ballinwilling	**Low Tide**				
Species	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**	**Mar-20**
Brent Goose		16		8	14
Red-throated Diver	1				
Great Northern Diver	7		1	1	3
Cormorant	4	1		4	2
Shag	2		2		1
Little Egret		1			
Oystercatcher	38	29	82	53	19
Ringed Plover					1
Grey Plover	2				
Sanderling	16	5		11	18
Turnstone	2		12	1	
Redshank	1				1
Greenshank				1	1
Curlew	19	40	37	112	10
Black-headed Gull	5		1	7	
Common Gull	1			29	
Herring Gull	14	48		35	2
Great Black-backed Gull	5	3		1	
Lesser Black-backed Gull	10			17	
Glaucous Gull				1	
	127	143	135	281	72

Great Northern Divers were recorded each month apart from December and varied from 9 in November to 1 in January and February. Most of the Curlew sightings were made in the West and East Felds (see Figure 1) with smaller numbers recorded feeding on the shore. Herring Gulls were seen each month with a peak of 48 recorded during the low tide count in December.

Table 3 Monthly totals of birds recorded on high tide counts in each of the five sections at Ballinwilling during the survey period.

Ballinwilling	**1**	**2**	**3**	**4**	**5**
November	54	56	62	34	17
December	57	25	26	15	23
January	141	44	19	8	6
February	7	3	104	99	50

March	20	1	1	26	3
Totals:	279	129	212	182	99
Mean:	55.8	25.8	42.4	36.4	19.8

Total bird numbers recorded during high tide counts in each of the sections over the 5-month survey period varied significantly from Section 1 (279 sightings) to Section 5 (99 sightings). There was considerable variation also in numbers of birds recorded within sections, for instance, 141 birds were recorded in high tide counts in Section 1 in January but only 7 birds were seen in February. The mean totals for each section vary from 19.8 in Section 5 to 55.8 in Section 1.

Table 4 Monthly totals of birds recorded on low tide counts in each of the five sections at Ballinwilling during the survey period.

Ballinwilling	1	2	3	4	5
November	61	6	36	11	13
December	11	47	51	12	22
January	36	1	2	30	66
February	30	57	61	100	33
March	11	16	17	10	18
Totals:	149	127	167	163	152
Mean:	29.8	25.4	33.4	32.6	30.4

There was less variation in total numbers recorded during low tide counts in each of the sections during the count period varying from Section 3 (167 sightings) to Section 2 (127 sightings). The mean totals for each section varied from 33.4 in Section 3 to 25.4 in Section 2.

Redbarn-Claycastle

High and low tide counts were conducted at Redbarn-Claycastle from November to March (see Table 5 and Table 6 below). A total of 22 species was recorded over this period. Numbers of birds recorded during low tide counts were higher in all months except November and low tide bird counts were significantly higher than high tide counts in December, January and February. Numbers of birds seen on high and low tide counts were similar in November and March. The highest numbers of birds recorded during the high tide counts were seen in November and February whereas the highest low tide numbers were recorded in December and February.

Table 5 High tide counts at Redbarn-Claycastle (beach, sea and fields) from November to March.

Redbarn-Claycastle	**High Tide**				
Species	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**	**Mar-20**
Teal				24	2
Eider			2		
Cormorant	1	1	1		1
Shag		5	17		

Little Egret	3	1		1	
Grey Heron		1		1	
Oystercatcher	42				
Ringed Plover	20				
Sanderling	50				
Turnstone				1	
Dunlin	1				
Redshank			1		
Curlew				68	76
Black-headed Gull	2	3	4	2	
Common Gull		15	1	3	
Herring Gull	9	5		4	3
Great Black-backed Gull		6			
	128	37	26	104	82

Bar-tailed Godwit had the highest combined monthly total per species but this related to two large gatherings (152 and 71 in January and February respectively) in Section 1 and the species was not recorded in December and March (see Table 6 below). Sanderling, on the other hand, was recorded in each month averaging 43 per month during low tide counts. Species such as Mute Swan, Mallard, Teal, Little Egret, Grey Heron, Water Rail and most of the Curlew were seen in Ballyvergan Marsh or the fields to the west of the marsh. Smaller numbers of Black-headed, Common and Herring Gull were recorded in most months, especially during the low tide counts.

Table 6 Low tide counts at Redbarn-Claycastle (beach, sea and fields) from November to March.

Redbarn-Claycastle	**Low Tide**				
Species	**Nov-19**	**Dec-19**	**Jan-20**	**Feb-20**	**Mar-20**
Mute Swan		5			
Mallard				2	
Teal				15	
Cormorant		3	2	1	
Shag	1	2	5		
Little Egret		3		2	
Water Rail		1			
Oystercatcher	13	10	13	10	
Grey Plover			1		
Sanderling	14	84	34	76	7
Redshank	1	2		1	1
Bar-Tailed Godwit	1		152	71	
Curlew		3		69	85
Black-headed Gull	17	8	18	11	
Common Gull	31	17	9	20	2
Herring Gull	16	52	11	16	
Great Black-backed Gull	6	1			
	100	191	245	294	95

No divers were recorded at Redbarn-Claycastle during the five months of winter surveys but two Eiders (a scarce winter visitor to Cork) were recorded in January during the high tide count. Small numbers of Cormorant, Shag and Redshank were seen throughout the winter period. Grey Plover, Turnstone and Dunlin were each recorded on single occasions.

Table 7 Monthly totals of birds recorded on high tide counts in each of the five sections at Redbarn-Claycastle during the survey period.

Redbarn-Claycastle	1	2	3	4	5
November	6	3	74	36	9
December	0	8	5	13	11
January	3	3	2	0	18
February	45	53	4	2	0
March	5	73	1	2	1
Totals:	59	140	86	53	39
Mean:	11.8	28	17.2	10.2	7.8

Total bird numbers recorded during high tide counts in each of the sections over the 5-month survey period varied significantly from Section 2 (140 sightings) to Section 4 (53 sightings). There was considerable variation also in numbers of birds recorded within sections, for instance, 74 birds were recorded in high tide counts in Section 3 in November but only 1 bird was seen in March in the same section. The mean totals for each section vary from 7.8 in Section 5 to 28 in Section 2.

Table 8 Monthly totals of birds recorded on low tide counts in each of the five sections at Redbarn-Claycastle during the survey period.

Redbarn-Claycastle	1	2	3	4	5
November	50	8	16	14	12
December	77	53	45	4	12
January	211	6	1	2	25
February	166	116	8	2	2
March	86	9	0	0	0
Totals:	590	192	70	22	51
Mean:	118	38.4	14	4.4	10.2

There was even greater variation between the sections during low tide counts, varying from Section 1 (590 sightings) to Section 4 (22 sightings). Large variations were also recorded within sections, for instance, 45 birds were recorded in low tide counts in December in Section 3 compared to 0 birds in March.

In an attempt to assess levels of human disturbance at Redbarn-Claycastle, numbers of walkers and their dogs were recorded on each of the counts (apart from High Tide counts in March). The numbers of walkers and dogs recorded are shown in Appendix 2.

Marine Bird Surveys at Claycastle

Table 9 One-day totals per month of bird sightings recorded during marine bird surveys at Claycastle between November and March.

Species	November	December	January	February	March	Total	Mean
Brent Goose	0	15	0	12	0	27	5.4
Common Scoter	2	0	0	0	0	2	0.4
Gannet	0	0	5	0	0	5	1
Cormorant	3	13	8	3	4	31	6.2
Shag	0	1	0	0	0	1	0.2
Oystercatcher	0	36	7	4	0	47	9.4
Ringed Plover	0	12	0	0	0	12	2.4
Sanderling	0	0	21	20	159	200	40
Dunlin	0	0	0	21	0	21	4.2
Black-headed Gull	81	143	51	62	16	353	70.6
Common Gull	65	35	153	18	7	278	55.6
Herring Gull	212	40	79	103	74	508	101.6
Great Black-b. Gull	54	13	32	18	25	142	28.4
Lesser Black-b. Gull	34	0	0	0	0	34	6.8
Kittiwake	18	0	0	0	0	18	3.6
Total:	469	308	356	261	285	1679	

It is important to note that the species totals above refer to sightings of birds flying past or landing within the designated survey area (a 420 metre wide area of shoreline and sea extending approximately 450 metres from the shore). Many of the species totals recorded above refer to multiple sightings of the same birds as they flew up and down the coast or remained within the survey area for several minutes and this was especially true of gulls. There was a distinct passage of birds flying northeast during the November survey and it is likely that the majority of sightings on that date refer to individual birds passing through the survey area.

Significant differences in totals are apparent between months. Daily totals vary from 469 recorded sightings in November to 261 in February. The numbers recorded in November are likely related to the near gale conditions caused by the easterly Force 6-7 winds. In contrast, south-westerly winds of Force 5-6 in February resulted in the lowest daily total recorded over the five surveys. The second highest total was recorded in January with moderate south-westerly winds of Force 3-4.

15 species of waterbirds were seen during the surveys. Gulls were the most frequently recorded waterbirds and the six species recorded accounted for 79% of the sightings. 508 Herring Gull sightings accounted for 30% of the total and 353 Black-headed Gull sightings accounted for 21% of the total. 280 sightings of four species of wader accounted for just 16.67% of the total. Gannet, Cormorant and Shag sightings (37) accounted for 2.2% of the total. Only two species of wildfowl were recorded (Brent Goose and Common Scoter) and their combined totals accounted for just 1.7% of the total.

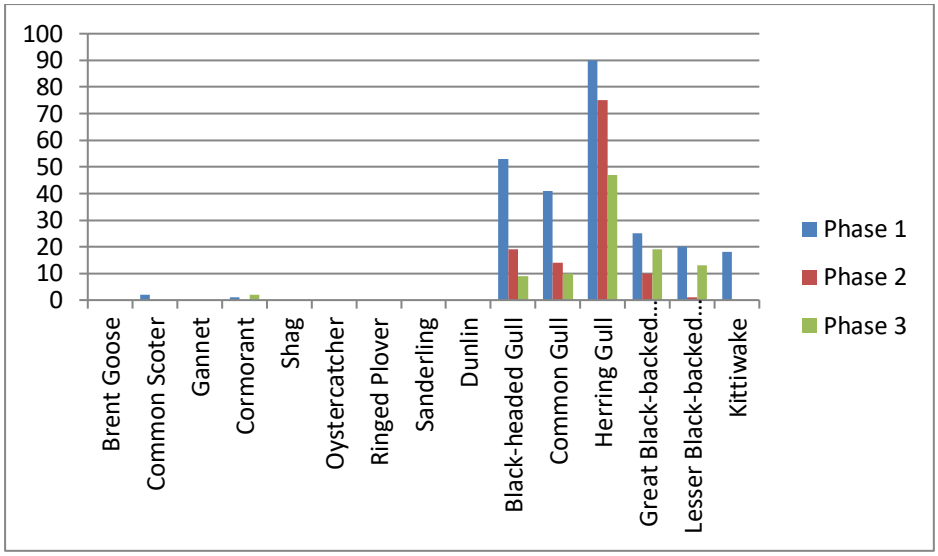


Figure 5 Numbers of birds recorded at Claycastle on November 30th 2019. Phase 1 represents High Tide sightings, Phase 2 represent s Mid Tide sightings and Phase 3 represents Low Tide sightings.

Bird sightings tended to be higher for most species (especially gulls) during the high tide counts (see Figures 5- 8). November was the only month when Common Scoter and Kittiwakes were recorded (see Figure 5 above) and this is likely to be directly related to the strong east winds that occurred during this count. The highest numbers of Herring Gull (212), Great-black-backed Gull (54) and Lesser Black-backed Gull were all recorded on this count. Numbers of Black-headed Gull and Common Gull were also higher than average in November.

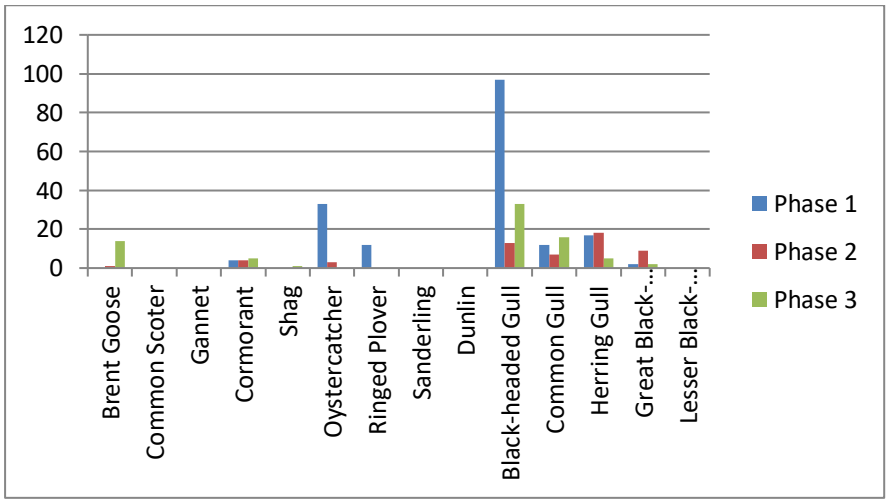


Figure 6 Numbers of birds recorded at Claycastle on December 30th 2019. Phase 1 represents High Tide sightings, Phase 2 represent s Mid Tide sightings and Phase 3 represents Low Tide sightings.

Unusually large numbers of Black-headed Gull sightings (143) were notable in the December count (see Figure 6.) Exceptionally large numbers of Common Gull sightings (153) were recorded during the January count (see Figure 7 below).

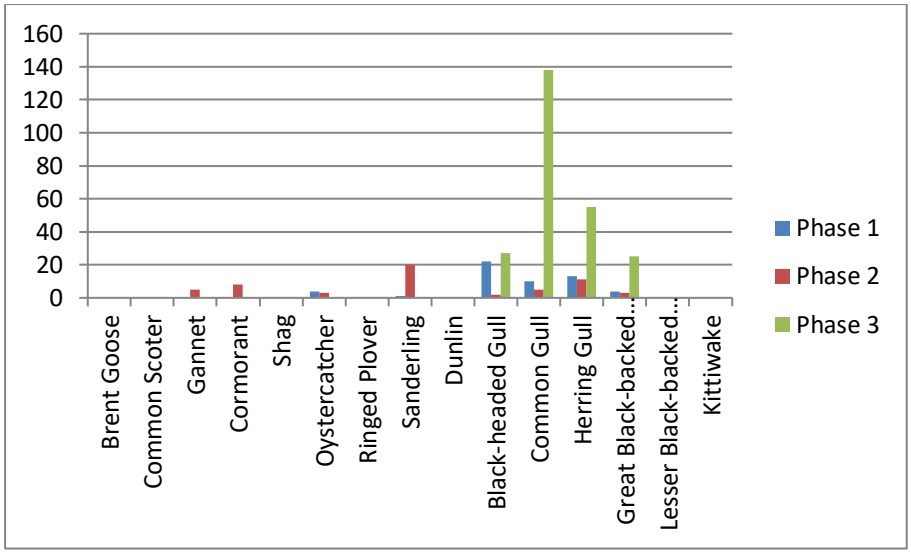


Figure 7 Numbers of birds recorded at Claycastle on January 10th 2020. Phase 1 represents Low Tide sightings, Phase 2 represent s Mid Tide sightings and Phase 3 represents High Tide sightings.

January was the only month when Gannets were recorded and 5 were seen on this count. Unusually, no waders of any species were recorded in the January count.

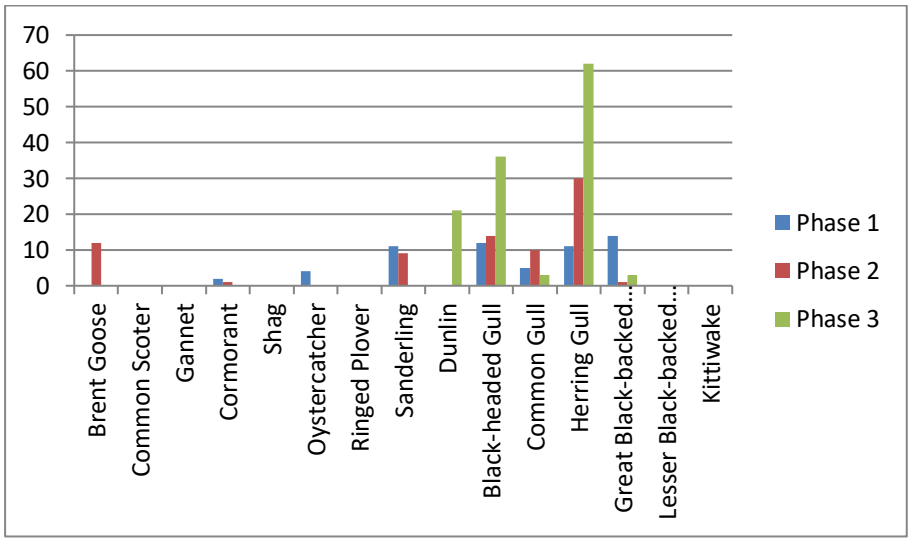


Figure 8 Numbers of birds recorded at Claycastle on February 19th 2020. Phase 1 represents Low Tide sightings, Phase 2 represent s Mid Tide sightings and Phase 3 represents High Tide sightings.

A comparatively large flock of Sanderling (159) was the most remarkable record in the March count and they remained on the beach close to the vantage point for most of the high tide count.

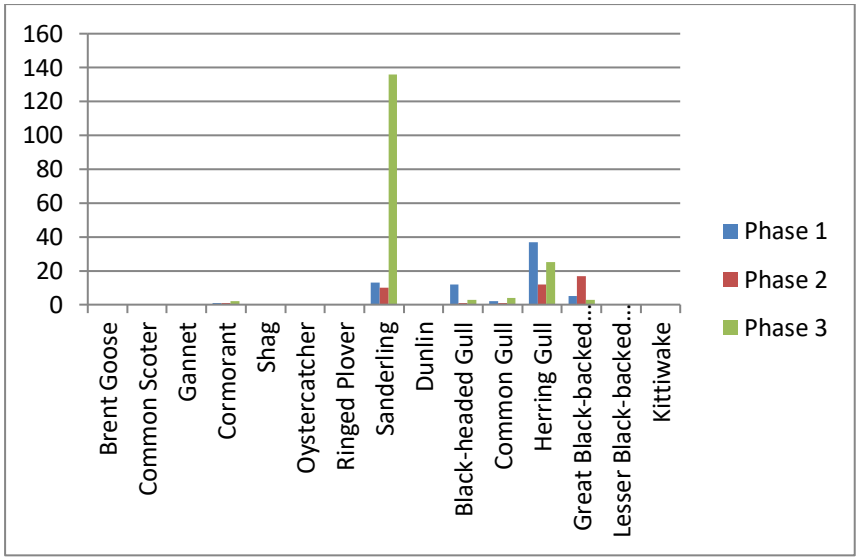


Figure 9 Numbers of birds recorded at Claycastle on March 19th 2020. Phase 1 represents Low Tide sightings, Phase 2 represent s Mid Tide sightings and Phase 3 represents High Tide sightings.

Line Transect Surveys

Ballyadam

Line transect counts following a circular path around the interior of the site (see Figure 3) began in January (access difficulties in December limited survey work to the north and west perimeters) and continued on a monthly basis through to March. 32 species (all of them widespread and common) were recorded (see Table 10). Small numbers of the red-listed species Black-headed Gull and Meadow Pipit and amber-listed species Teal, Snipe, Lesser black-backed Gull, Robin, Stonechat, Goldcrest, Greenfinch and Linnet were recorded. The highest number of birds (132) and the highest number of species (25) were recorded in January. A considerably lower number of birds (85) and a smaller number of species (22) were recorded in February. In March, 125 birds of 21 species were recorded.

Table 10 Species recorded on line transect surveys at Ballyadam in January, February and March. Access difficulties in December restricted counts to vantage points on the north and west perimeters.

Species	Dec. 24	Jan. 17	Feb. 25	Mar. 20
Mallard		2	2	
Teal	4	4	6	10
Grey Heron		1		
Common Buzzard				1
Snipe		5	12	2
Black-headed Gull			2	
Lesser Black-backed Gull	6			
Woodpigeon		5	4	2

Meadow Pipit		1	2	1
Pied Wagtail		1	1	1
Dunnock		9	3	1
Robin	1	8	9	5
Stonechat		1		
Song Thrush		5	1	2
Redwing	3	8		
Blackbird		8	6	3
Goldcrest	1	3	1	
Wren		3	8	8
Great Tit		3	1	1
Coal Tit			1	
Blue Tit		6	1	1
Long-tailed Tit		8	4	
Magpie		2		1
Jay				2
Jackdaw		2		
Rook	8	14		70
Hooded Crow		4	3	2
Chaffinch	1	4	3	1
Lesser Redpoll		2	2	
Goldfinch		23	11	8
Greenfinch				1
Bullfinch			2	2
Totals:	24	132	85	125

Kilquane

Line-transect surveys were conducted monthly at Kilquane between December 2019 and March 2020. The survey followed a circular route through the interior of the forest and along the western perimeter. 23 species were recorded in total (all of them common and widespread). An additional six species were recorded at Kilquane during evening surveys: Pheasant, Snipe (Amber-listed), Redwing, Fieldfare, Raven and Bullfinch. Two Amber-listed species were among the species recorded: Robin and Goldcrest. The highest monthly species total (17) was recorded in March. Species totals were very consistent in the first three months: December (14), January (15) and February (14). The highest monthly total (88) was recorded in March. The monthly total for December was 69; January total was 57 and a total of 45 birds were recorded in February.

Table 11 Species recorded on line transect surveys at Kilquane in December, January, February and March.

Species	**Dec. 12**	**Jan. 16**	**Feb. 25**	**Mar. 20**
Common Buzzard	1			
Sparrowhawk		2		2
Woodpigeon	25		1	6

Pied Wagtail			2	
Dunnock	3	2	1	2
Robin	1	4	11	4
Song Thrush		1		1
Blackbird	3	1	1	2
Goldcrest	2	1	3	6
Wren	3	7	4	13
Great Tit	1		2	1
Coal Tit	14	20	6	10
Blue Tit	1	1	1	3
Long-tailed Tit		3		4
Magpie	1	1		
Jay		1	1	
Jackdaw	6			
Rook		1		
Hooded Crow	3	9	1	1
Chaffinch	5	3	8	21
Lesser Redpoll				1
Goldfinch				3
Siskin			3	8
	69	57	45	88

Hen Harrier Winter Roost Surveys

Hen Harrier winter roost surveys were undertaken at Ballyvergan Marsh and Kilquane between November 2019 and March 2020.

Ballyvergan

Hen Harriers were recorded on four of the five winter roost surveys between November and March. A minimum of two birds was seen on each of the months they were recorded and up to five were seen in November. Recording the exact number can sometimes be difficult as some birds alight after settling (often unnoticed) and may leave the roost site only to return again later. Three birds (all females or immatures) were seen together and it was thought that at least one and possibly two later sightings (females/immatures) were additional birds arriving after the first three had settled. No birds were seen in December but it is possible that birds either roosted earlier than usual or alternatively, birds were not seen as they flew in stealthily to roost. A minimum of two birds (adult male and female/immature) was seen in January and possibly a third bird (female/immature). Two birds, (adult male and female/immature) were recorded in February and a minimum of two birds (adult male and female/immature) was recorded in March.

Table 12 Species recorded during Hen Harrier winter roost surveys at Ballyvergan Marsh.

Species	November 11	December 12	January 1	February 19	March 11
Hen Harrier	3-5	0	2-3	2	2-3
Buzzard	0	1	1	0	0

Sparrowhawk	0	0	1	0	0
Peregrine	1	0	0	0	0
Mute Swan	0	0	0	2	0
Mallard	4	0	0	0	0
Teal	0	0	1	0	0
Little Egret	2	3	2	1	0
Grey Heron	0	1	1	1	0
Curlew	2	37	0	97	3

Roosting sites varied significantly and birds appeared to regularly choose different sites. The closest roosting point in November was approximately 1325 metres west of the proposed pipeline. In January, the closest roosting point was 725 metres west; the closest roosting point in February was 1120 metres west and the closest roosting point in March was 870 metres southwest of the proposed pipeline.

Several other species of conservation interest were recorded during the Hen Harrier roost survey including a Peregrine in November, a maximum of three Little Egrets were seen each month apart from March and a maximum of 97 Curlew was recorded flying from the marsh in February. Single sightings of Buzzard and Sparrowhawk were recorded in December and January. Small numbers of Mute Swan, Mallard, Teal and Grey Heron were also recorded over the period.

Kilquane

No Hen Harriers or Woodcock were recorded during the evening surveys at Kilquane. The only birds of note recorded during these surveys were a single sighting of Buzzard in December and a pair of Buzzards in March; three Snipe were recorded in November and two were seen in February (see Table 13 below). A number of other species that were not recorded in the line transect surveys were seen during the evening surveys (see Page 18).

Table 13 Species recorded during Hen Harrier winter roost surveys at Kilquane.

Species	November 29	December 24	January 30	February 25	March 20
Buzzard	0	1	0	0	2
Snipe	3	0	0	2	0

Discussion

Following is an analysis of the conservation status of the species of conservation concern recorded in the various surveys at each of the sites between November 2019 and March 2020 and an assessment of the likelihood of disturbance to these species during the pipe-laying and construction phase at the various sites. This analysis refers to two criteria of conservation status: (a) international status of species designated under the European Union Birds Directive Annex 1 list which includes the species of highest conservation priority in Europe(EU 2009) and (b) national status in terms of species listed as Birds of Conservation Concern in Ireland (Burke *et al* 2019).

Wetland Bird Surveys

Ballinwilling

Table 14 Species of conservation concern recorded at Ballinwilling showing international and national designations. The red list applies to species that are endangered or vulnerable and amber list applies to species that have declined. 'W' refers to designation based on wintering populations and 'B' refers to breeding populations. The maximum number recorded between November 2019 and March 2020 and the All-Ireland population estimates where available (Burke *et al* 2019) are also shown.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded	All-Ireland Wintering Population
Brent Goose		W	11	35150
Common Scoter		B	1	10640
Great Northern Diver	Annex 1	W	6	2240
Cormorant		B/W	4	10870
Shag		B	2	N/A
Oystercatcher		B/W	66	60540
Grey Plover		W	4	2940
Redshank		B/W	1	23800
Curlew		B/W	51	35240
Black-headed Gull		B	38	N/A
Common Gull		B	88	N/A
Herring Gull		B	35	N/A
Great black-backed Gull		B	5	N/A

Great Northern Diver was the only species listed on Annex 1 of the 'Birds Directive' (EU 2009) recorded at Ballinwilling during the wetland bird surveys. A maximum of 6 was recorded in November but numbers varied from 1 to 3 on all other counts. The All-Ireland population estimate for this species is 2240 (Burke *et al* 2019) and the Ballinwilling maximum represents 0.26% of the All-Ireland population. The species was recorded at least once in all 5 of the count sections at

Ballinwilling and this would indicate that disturbance during the pipeline installation phase (were it to go ahead at this site) would be unlikely to cause serious displacement of this small population.

Five red-listed Birds of Conservation Concern in Ireland (BOCCI) species were recorded during the surveys at Ballinwilling: Common Scoter, Redshank, Curlew, Black-headed Gull and Herring Gull. The maximum number of Common Scoter and Redshank recorded was 1 and based on these figures Ballinwilling is not an important wintering site for either of these species. Curlews were recorded in each of the sections throughout the surveys with a maximum of 51 recorded in February. The great majority of the higher counts were recorded in the west fields and east fields (see Figure 1) and birds appear to move between these fields and the beach. In the February low tide count a flock of 51 birds moved to and from the east fields to the beach in section 4. In the event of pipeline work being undertaken at Ballinwilling, it is likely that birds would have sufficient choice of foraging areas to avoid displacement.

Redbarn-Claycastle

Table 15 Species of conservation concern recorded at Redbarn-Claycastle showing international and national designations as well as the maximum number recorded between November 2019 and March 2020 and the All-Ireland population estimates where available (Burke *et al* 2019) are also shown.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded	All-Ireland Wintering Population
Mute Swan		B/W	5	9130
Teal		B/W	24	35740
Eider		B/W	2	5660
Cormorant		B/W	2	10870
Shag		B	17	N/A
Little Egret	Annex 1		3	1390
Oystercatcher		B/W	36	60540
Grey Plover		W	1	2940
Dunlin	Annex 1	B/W	1	45760
Redshank		B/W	2	23800
Bar-tailed Godwit	Annex 1	W	152	16530
Curlew		B/W	85	35240
Black-headed Gull		B	9	N/A
Common Gull		B	27	N/A
Herring Gull		B	38	N/A
Great black-backed Gull		B	4	N/A

Three species listed on Annex 1 of the Birds Directive were recorded on counts at Redbarn-Claycastle between November and March. Up to 3 Little Egrets were regularly seen at Ballyvergan Marsh or flying to or from the marsh. O.21% The All-Ireland population estimate for this species is

1390 (Burke *et al* 2019) and the Ballinwilling maximum represents 0.21% of the All-Ireland population. This species is increasing in Ireland and is not perceived to be threatened hence it is green-listed on the BOCCI list. The limited proposed construction work at Ballyvergan (should this site be chosen as a route for the pipeline) is located approximately 490 metres east of one of the channels used by Little Egrets as a foraging habitat. There are several hundred metres of channels in the marsh and any disturbance to this small population of Little Egrets is likely to be minimal and of short-term duration.

Dunlin is another Annex 1 species (also red-listed), that was seen on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species and any potential disturbance caused at this site by pipe-laying activities (should the site be chosen) is likely to be inconsequential to this species.

Bar-tailed Godwit is the third Annex 1 species recorded during the count period. This species is amber-listed as a bird of conservation concern in Ireland. Bar-tailed Godwits were recorded on three occasions during low-tide counts at Redbarn-Claycastle (see Table 6 above). In November a single bird was seen in Section 1. In January however, a large count of 152 was recorded during a low-tide count at Section 1 and this was followed in February by a significant record of 71 during the low-tide count. The All-Ireland population estimate for this species is 16,530 (Burke *et al* 2019) and the January count represents 0.91% of the All-Ireland population. This number is very close to the 1% requirement that would render the site of national importance (if such numbers were recorded each year over a five-year period). On each occasion the birds were observed feeding on the south end of Section 1 (see Figure 2 above). This section is within 125 metres of Ballymacoda Bay SPA (NPWS 2020b), one of the most important sites in Ireland for wintering waterbirds and designated as an SPA as it regularly holds over 20,000 birds during the winter period. A maximum count of 792 Bar-tailed Godwits (representing 4.3% of the national population) has been recorded and Bar-tailed Godwit is one of the site's 16 special conservation interest species (NPWS 2020). Bar-tailed Godwits were not recorded in any of the other sections during the count period and the area used by the birds is approximately 1,400 metres southwest of the proposed pipe-laying area (should it be chosen) and therefore disturbance is likely to be minor or inconsequential to this species.

In addition to the species referred to above, an additional four red-listed species were recorded during the count period. Very small numbers of Redshank (maximum 2) were recorded during the count period and Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species and any potential disturbance caused at this site by pipe-laying activities (should the site be chosen) is likely to be inconsequential to this species.

Curlews were recorded in December (maximum 3), February (maximum 69) and March (maximum 85) during high and low tide counts at Redbarn-Claycastle (see Tables 5 & 6 above). The vast majority of the birds were recorded in the fields west of Ballyvergan (approximately 880 metres southwest of the proposed pipe-laying) or within a section of marsh within Ballyvergan (approximately 470 metres west of the proposed pipe-laying area). This flock of up to at least 85 birds (97 were recorded during the Hen Harrier Winter Roost Survey, see Table 12 above) appears to move between the fields west of the marsh, Ballyvergan Marsh and Ballymacoda Bay SPA. Birds using the non reedbed area of Ballyvergan Marsh in February and March would possibly be subjected to some disturbance should pipe-laying activities take place during this period but it is

likely that these birds would move to the fields adjacent to the west of the marsh where they are unlikely to be affected.

Small numbers of Black-headed Gull were recorded in each month (apart from March) with maximum numbers of 17 and 18 recorded in November and January (see Tables 5 & 6 above). Birds were recorded in each section, especially during low tide periods. The Black-headed Gull is probably the most numerous and widespread gull in Ireland. It is an opportunistic species that avails of feeding opportunities on freshwaters, estuaries in marine and terrestrial areas and they commonly feed at ploughed fields, abattoirs, fish factories, sewage outfalls, rubbish dumps (Crowe 2005). This species is unlikely to be disturbed by pipe-laying activities (other than a hydrocarbon pollution event or other serious pollution) and is instead likely to avail of the feeding opportunities presented by such activities.

Slightly higher numbers of Herring Gulls were recorded in each month during the survey period. Birds were recorded in each section in small numbers (mostly low single figures) apart from 38 in Section 1 during the low tide count in November and 10, again during a low tide count, at Section 1 in February. Herring Gulls are also opportunistic feeders (Crowe 2005) and this species is unlikely to be negatively impacted by pipe-laying activities (other than a hydrocarbon pollution event)

Several amber-listed species were recorded in small numbers during the count period and most of these species are unlikely to be seriously impacted by pipe-laying activities. A maximum number of 24 Teal was recorded in Ballyvergan Marsh in February during a cold spell. This is likely to be an underestimate of the wintering population at Ballyvergan Marsh as Teal are difficult to survey given their preference for sites with substantial cover such as reedbeds (Crowe 2005). Teal are likely to experience short-term disturbance by pipe-laying activities within approximately 500 metres of the work site and may move to areas farther west in the marsh.

Small numbers of Oystercatchers were recorded throughout the period in all sections especially during low tide counts. A maximum of 36 birds was recorded roosting on a grassy hill to the east of the proposed pipe-laying site in November. Oystercatchers are used to human (and dog) disturbance caused by the large numbers of walkers at Claycastle and they regularly fly to quieter spots along the beach to resume feeding. They are unlikely to experience serious disturbance due to pipe-laying activities.

A maximum of 27 Common Gulls was recorded during low tide in November and smaller numbers were recorded in each of the five sections throughout the count period. Like the two other gull species referred to above, Common Gulls are opportunistic feeders and are unlikely to be seriously impacted by pipe-laying activities at Claycastle.

Redbarn and Claycastle are very popular recreational sites especially during the summer months but considerable numbers of walkers and their dogs visit the site for exercise purpose throughout the year. Joggers, walkers and their dogs cause considerable disturbance to waterbirds especially during high water as the available shoreline area can be as narrow as 3-5 metres in places. Numbers of walkers and their dogs were recorded during wetland bird surveys and can be seen in Appendix 2. The regularly occurring species such as Oystercatcher, Sanderling and the various gull species have become habituated to human-related disturbance and their natural response is to fly on to less disturbed stretches of beach.

Marine Bird Surveys

Claycastle

Marine bird surveys were carried out at Claycastle to gain a better understanding of bird activity over a prolonged period (3 x 1 hour surveys as opposed to a few minutes during roving surveys) at different tidal states. Two of the surveys (November and February) were deliberately held during strong winds to establish whether or not wind is likely to influence numbers of birds using the site. The strong easterly wind in November is likely to be the main explanation for the high numbers recorded on this count (see Table 9 above). In contrast, the strong south-westerly winds that occurred during the February count coincided with the lowest number of birds recorded (261).

Table 16 Species of conservation concern recorded at Claycastle during marine bird surveys showing international and national designations as well as the maximum number recorded between November 2019 and March 2020.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded
Brent Goose		W	14
Common Scoter		B	2
Gannet		B	5
Cormorant		B/W	8
Shag		B	1
Oystercatcher		B/W	33
Dunlin	Annex 1	B/W	21
Black-headed Gull		B	97
Common Gull		B	138
Herring Gull		B	90
Great black-backed Gull		B	25
Lesser black-backed Gull		B	20
Kittiwake		B	18

A single Annex 1 species (Dunlin) was recorded in the February count when a small flock of 21 flew south. This was the only record of Dunlin at Redbarn-Claycastle (apart from a single record of a solitary bird during the wetland bird survey) and as stated above (Page 23), Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species.

The red-listed Common Scoter was recorded on one occasion only when 2 birds were seen in November during strong winds. Claycastle is not an important site for this species and pipe-laying activities are not likely to have any significant impact on this species.

Black-headed Gull and Herring Gull (both red-listed, see Table 16 above) were the species recorded in the highest numbers as well as being the two most frequently recorded species in the marine bird surveys at Claycastle (see Table 9 above). A total of 508 Herring Gull and 353 Black-headed Gull sightings were recorded during the surveys. Many of these records refer to repeat sightings of individual birds foraging up and down the beach at Claycastle, or foraging in the town of Youghal. The strong winds in November did result in a significant passage of both species and the higher

numbers recorded on that count are likely to refer mostly to individual sightings (as opposed to repeat sightings).

Black-headed Gull was added to the red-list of birds of conservation concern because of serious declines in the breeding season possibly as a result of the loss of safe nesting sites, drainage, food depletion and predation by American Mink (Balmer *et al* 2013).

Herring Gull was added to the red-list because of serious declines (up to 60%) in several important breeding colonies. A variety of factors have been implicated in this decline ranging from botulism contracted at refuse sites to loss of feeding opportunities due to the closure of refuse sites, reduction of fishing industry discards and increased rates of mammalian predation (Balmer *et al* 2013).

Both of these species are opportunistic foragers and readily adapt to changing foraging opportunities. They are unlikely to suffer serious disturbance as a result of by pipe-laying activities (other than the impacts of a serious pollution event) and are instead likely to avail of potential feeding opportunities created by sediment disturbance during the pipe-laying process.

Seven amber-listed species were observed during the surveys in varying numbers (see Table 9 above). Brent Geese were recorded on three occasions but only in flight and Claycastle is not an important site for this species. Gannet, Lesser Black-backed Gull and Kittiwake were only recorded in flight over the site during the strong winds in November and the Claycastle area does not appear to be of any great significance for these species. Cormorants and Shags were recorded in small numbers and most birds seen were in flight or feeding well offshore over a wide area. Neither of these species is likely to suffer serious disturbance as a result of by pipe-laying activities. Oystercatchers were recorded in small numbers on several of the surveys. Oystercatchers have become habituated to frequent disturbance by walkers and their dogs at Claycastle and their usual response is to fly along to the closest disturbance-free foraging area. Common Gulls were the third most frequently recorded species at Claycastle (in terms of numbers and frequency of occurrence). They are unlikely to be seriously impacted by pipe-laying activities because of their adaptable opportunistic foraging behaviour. Great black-backed Gulls were recorded in reasonable numbers (with an average of 28 sightings per survey). Great Black-backed Gulls are opportunistic feeders like their other gull relatives above and are unlikely to be seriously impacted by pipe-laying at Claycastle should it be chosen as the landfall for the pipeline.

Line Transect Surveys

Ballyadam

Two red-listed species were recorded during line-transect surveys at Ballyadam between December and March (see Table 17 below). 2 Black-headed Gulls were seen briefly in the site on one survey and this species is unlikely to occur regularly at Ballyadam due to the lack of suitable habitat. Meadow Pipits were recorded in small numbers (maximum 2) on all of the walk-through surveys (access was not possible in December) and small numbers winter in grassland areas within the site. Limited construction work at Ballyadam in the event of the site being chosen for development is unlikely to have a serious impact on the small numbers of Meadow Pipits wintering at the site.

Table 17 Species of conservation concern recorded at Ballyadam during Line Transect Surveys showing international and national designations as well as the maximum number recorded between December 2019 and March 2020.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded
Teal		B/W	10
Snipe		B/W	12
Black-headed Gull		B	2
Lesser Black-backed Gull		B	6
Meadow Pipit		B	2
Robin		B	9
Stonechat		B	1
Goldcrest		B	3
Greenfinch		B	1

Several amber-listed species were recorded in the winter surveys including Teal and Snipe. Both of these species are wetland birds that occur in relatively small numbers at the site. Teal (probably no more than 10) are confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys. An equally small population of Snipe winters in an area of wet grassland in the northwest corner and wet grassland south of this area as far as the road through the site (see Figure 3 above) and up to 12 have been flushed from this area during surveys. Construction work in this area (depending on the footprint of such work) would likely result in at least some displacement of the Snipe population.

On one occasion, 6 Lesser Black-backed Gulls were seen flying over the site, landing briefly and then flying out of the site. The overall dry nature of Ballyadam with its rank, uncultivated grassland, large areas of exposed stone and very little open water make this site largely unattractive to gulls of any species and consequently, Lesser Black-backed Gulls are very unlikely to be seriously impacted by any development at the site. Robin, Stonechat, Goldcrest and Greenfinch were also recorded in the winter surveys. All of these species are widespread in Ireland and Robin and Goldcrest are abundant. Both of these species are likely to be unaffected by construction work as long as most of the woodland areas remain intact. A single Stonechat was recorded in the wet grassland area close to the interior road. A single Greenfinch was heard singing on the northern perimeter of the site (see Table 17).

The site does not appear to be an important location for wetland birds in the winter due to the very limited areas of suitable habitat and Ballyadam is not likely to be of any great significance to the species of Special Conservation Interest in the nearby Cork Harbour SPA.

Kilquane

Only three species of conservation concern were recorded during surveys at Kilquane: Sparrowhawk, Robin and Goldcrest. All three of these species are widespread and common in Ireland and Robin

and Goldcrest were amber-listed because of declines in their populations as a result of the two cold winters of 2009-10 and 2010-11. Populations of both of these species have since recovered although there is trend of ongoing decline in Robin abundance as revealed by ongoing monitoring in the Countryside Bird Survey (Lewis *et al* 2019). Both species are common and widespread in Kilquane although Goldcrest was almost certainly under-recorded because the species' preference for the canopy can make it difficult to detect in winter surveys and most males had yet to commence territorial song by time the winter surveys had been completed.

Table 18 Species of conservation concern recorded at Kilquane during Line Transect Surveys showing international and national designations as well as the maximum number recorded between December 2019 and March 2020.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded
Sparrowhawk		B	2
Robin		B	11
Goldcrest		B	3

The Sparrowhawk is the most common bird of prey in Ireland (Greenwood *et al* 2003) and they frequently occur in conifer forests. A pair was seen in the January survey and it is likely that they breed regularly at Kilquane. Sparrowhawks are not likely to be seriously impacted by construction activities at Kilquane (should the site be chosen) provided adequate numbers of suitably sized nest trees remain. There is no shortage of such habitat at Kilquane notwithstanding recent extensive clear-felling.

Hen Harrier Winter Roost Surveys

Ballyvergan Marsh

Three Annex 1 species (Hen Harrier, Peregrine and Little Egret) were recorded at Ballyvergan Marsh during Hen Harrier Winter Roost Surveys (see Table 12 above). A minimum of two Hen Harriers was recorded on each survey (apart from December) and up to five were present in the November survey. Hen Harriers tend to use Ballyvergan primarily as a roost site and birds seem to leave the reedbed in the morning to hunt farther afield during the day although a single bird was seen hunting along the old railway track in the afternoon (14.41pm) on the January wetland bird survey. Roost surveys indicate that there is a distinct preference for roosting on the west side of the marsh and the closest roosting bird was estimated to be 725 metres west of the proposed pipe-laying site (should Claycastle be chosen as the landfall) and birds roosted up to 1325 metres (estimated) to the west. The estimated distances between roost sites and the proposed construction site areas follow:

- November: 16:04
- January: 15:47

- February: 17:22
- March: 17:55

Given the distances to the roost sites and the relatively late arrival of the birds at the roost site, it is unlikely that the wintering Hen Harrier population will be impacted negatively in terms of disturbance during construction work especially if any activities likely to produce noise effects were curtailed to periods prior to usual arrival times.

A single Peregrine was observed flying low over the marsh in hunting mode during the November survey. This is likely to be an irregular occurrence as much larger numbers of potential prey species can be found in nearby Ballymacoda Bay where they could be more easily captured. It is very unlikely that pipe-laying activities at a single location on the eastern extremity of Ballyvergan Marsh would have any negative impact on the local Peregrine population.

Table 19 Species of conservation concern recorded at Ballyvergan Marsh during Hen Harrier Winter Roost Surveys showing international and national designations as well as the maximum number recorded between November 2019 and March 2020.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded
Hen Harrier	Annex 1	B	3-5
Sparrowhawk		B	1
Peregrine	Annex 1		1
Mute Swan			2
Teal			1
Little Egret	Annex 1		3
Curlew			97

Up to three Little Egrets were seen feeding in the channels in the centre and the east of the marsh in every month apart from March. These birds appeared to arrive in the morning from a roost site near Redbarn, feed in the channels during the day and leave the marsh to fly back towards Redbarn each evening. It is possible that pipe-laying activities could cause some temporary disturbance to Little Egrets feeding within 500 metres but it is likely that the birds would move elsewhere in the marsh if disturbed by noise or vibrations and that no long term disturbance or displacement is likely to result from the work.

A single red-listed species, Curlew, was recorded in varying numbers each month (apart from January) with a maximum of 97 birds recorded in February. This is the same group of birds that was recorded in the Redbarn-Claycastle surveys (see Page 22 above). Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh. It is likely that in the event of disturbance during pipe-laying, birds would move to the west fields.

Two amber-listed species, Mute Swan and Teal were recorded in small numbers (larger numbers of Teal were recorded in the wetland bird surveys, see Page 23 above). A resident pair of Mute Swan

occurs at the site and they tend to frequent the west side of the marsh close to the R633 road and they are unlikely to be negatively impacted by pipe-laying activities. Teal occurring within 500 metres of construction work may experience disturbance but it is likely that displaced birds would temporarily move to the west of the marsh.

A single Sparrowhawk was observed flying over the marsh and landing on a tree during the January survey. Sparrowhawks are common in Ireland and it is likely that they occasionally hunt over the marsh. Temporary construction work on the east end of the marsh is not likely to have any impact on the Sparrowhawk population in the area.

Kilquane

No Hen Harriers were seen during Hen Harrier Winter Roost Surveys at Kilquane and only one species of conservation concern (Snipe) was recorded during these surveys.

Table 20 Species of conservation concern recorded at Kilquane during Hen Harrier Winter Roost Surveys showing international and national designations as well as the maximum number recorded between November 2019 and March 2020.

Species of Conservation Concern	EU Birds Directive (Annex I listed)	Birds of Conservation Concern in Ireland	Maximum Number Recorded
Snipe		B	3

Three Snipe flew low over the young plantation area (see Figure 4 above) and two birds were flushed from a newly planted clear-fell area in the east of the site in February. Construction work in this part of the forest (were it to be chosen) would likely cause displacement to this small population of Snipe. On the other hand, the newly planted area currently being used by a small number of Snipe is a temporary habitat that is likely to be deserted by Snipe within a year or two as tree and vegetation growth develops and renders the habitat unsuitable.

Conclusion

This report identifies the bird species that occur at the two potential landfall sites for the proposed Celtic Interconnector Pipeline and the two potential construction sites. Potential impacts on species of conservation concern are assessed and in the majority of cases no impact or no serious impact is deemed likely with a few possible exceptions. The following species were deemed to be susceptible to some degree of disturbance: Hen Harrier, Bar-tailed Godwit and Curlew.

There is a moderate possibility of disturbance to roosting Hen Harriers at Ballyvergan Marsh during pipe-laying activities on the east side of the marsh if noise levels are likely to be persistently high in the late afternoon period between November and March. Possible avoidance measures include a restriction of high-noise level operations to the period approximately 30 minutes prior to the earliest sightings of arriving Hen Harriers. Suggested cut-off times are:

- November: 15: 30
- January: 14:15
- February: 16:50
- March: 17:25

There is a low possibility of disturbance (depending on noise levels in the landfall area) to feeding Bar-tailed Godwits at Section 1 (Redbarn) during low tide conditions in January and February. Possible avoidance measures: restrict noisy operations to high-tide periods if work is deemed necessary in January and February.

There is a moderate possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels. Possible avoidance measure: avoid pipe-laying work (if noise levels are likely to be high) in February and March.

References

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. (2013) *Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland*. BTO Books, Thetford.

BTO (2020) Wetland Bird Surveys (WeBS or IWeBS in Ireland). Available at: https://www.bto.org/our-science/projects/wetland-bird-survey/about

Burke, B., Lewis, L.J., Fitzgerald, N., Frost, T., Austin, G. & Tierney, D. (2019) Estimates of waterbird numbers wintering in Ireland, 20011/12-2015/16. *Irish Birds* 41: 1-12.

Colhoun K and Cummins S (2013), Birds of Conservation Concern in Ireland 2014 –2019. *Irish Birds* 9: 523—544

Conway, G. & Norfolk, D. (2019) English Winter Bird Survey. Available at: https://www.bto.org/our-science/projects/english-winter-bird-survey

Crowe O. (2005) Ireland's Wetlands and their Waterbirds: Status and Distribution. Birdwatch Ireland

Crowe, O. & Holt, C. (2013) Estimates of waterbird numbers wintering in Ireland, 2006/07-2010/11. *Irish Birds* 9: 545-552.

EU (2009) Directive 2009/147/EC of the European Parliament and Council of30 November 2009 on the conservation of wild birds. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN

Gilbert G, Gibbons D. W. and Evans J. (1998). Bird Monitoring Methods, a manual of techniques for key UK species. RSPB.

Greenwood, J.J.D., Crick, H.Q.P. & Bainbridge, I.P. (2003) 'Numbers and International Importance of Raptors and Owls in Britain and Ireland' in *Birds of Prey in a Changing Environment*, Scottish Natural Heritage,The Stationery Office, Edinburgh.

Lewis, L. J. and Tierney, T. D. (2014) Low tide waterbird surveys: survey methods and guidance notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Lewis, L. J., Coombes, D., Burke, B., O'Halloran, J., Walsh, A., Tierney, T. D. & Cummins, S. (2019)Countryside Bird Survey: Status and trends of common and widespread breeding birds 1998-2016. IrishWildlife Manuals, No. 115. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

NPWS (2020a). Ballymacoda Bay SPA Available at: https://www.npws.ie/protected-sites/spa/004023

NPWS (2020b). Mapviewer Available at: http://webgis.npws.ie/npwsviewer/

Appendix 1

Survey Schedule and Weather Conditions

Site	Date	High /low Tide	Start time	End time	Wind	Rain	Cloud %	Visibility
Redbarn-Claycastle	29/11/19	High	07:45	09:05	NE2	Nil	30	Good
Redbarn-Claycastle	29/11/19	Low	12:30	13:45	E3	Nil	65	Good
Redbarn-Claycastle	23/12/19	High	13:50	15:00	SW1	Nil	95	Good
Redbarn-Claycastle	23/12/19	Low	08:50	10:10	SW1	Nil	30	Good
Redbarn-Claycastle	22/01/20	High	14:00	15:10	NW1	Nil	90	Good
Redbarn-Claycastle	22/01/20	Low	09:55	11:05	N1	Nil	25	Good
Redbarn-Claycastle	12/02/20	High	08:30	09:35	SW1	Nil	35	Good
Redbarn-Claycastle	12/02/20	Low	13:35	14:40	SW3	Shower	90	Good
Redbarn-Claycastle	04/03/20	High	12:30	13:50	NE3	Nil	85	Good
Redbarn-Claycastle	04/03/20	Low	17:35	18:20	NE2	Nil	75	Good
Ballinwilling	28/11/19	High	07:40	9:05	NW2	Nil	40	Good
Ballinwilling	28/11/19	Low	12:00	13:20	NW1	Nil	95	Good
Ballinwilling	29/12/19	High	08:25	09:43	S3	Nil	90	Good
Ballinwilling	29/12/19	Low	11:52	13:05	S3	Nil	100	Good
Ballinwilling	08/01/20	Low	09:50	11:35	SW1	Nil	95	Good
Ballinwilling	08/01/20	High	14:15	15:20	SW1	Nil	100	Good
Ballinwilling	06/02/20	High	14:30	16:00	SE4	Nil	95	Good
Ballinwilling	06/02/20	Low	09:25	11:10	SE3	Nil	100	Good
Ballinwilling	02/03/20	High	10:10	11:30	W3	Nil	10	Good
Ballinwilling	02/03/20	Low	16:15	17:10	W3	Nil	55	Good
Marine Claycastle	30/11/19	HML	07:35	14:35	E6-7	Nil	75	Good
Marine Claycastle	30/12/20	HML	08:00	15:00	SW2	Nil	100	Good
Marine Claycastle	10/01/20	HML	11:00	17:00	SW4	Shower	65	Good
Marine Claycastle	19/02/20	HML	08:23	15:25	SW6	Showers	100	Good
Marine Claycastle	10/03/20	HML	12:10	18:30	W4	Nil	100	Good
Ballyvergan HH	30/11/19	N/A	15:00	17:00	E6	Nil	100	Good
Ballyvergan HH	30/12/19	N/A	15:03	17:03	SW1	Nil	100	Good
Ballyvergan HH	22/01/20	N/A	15:35	17:35	NW1	Nil	100	Good
Ballyvergan HH	19/02/20	N/A	16:30	18:15	SW5	Drizzle	100	Good
Ballyvergan HH	11/03/20	N/A	17:48	19:00	SW4	Nil	60	Good
Kilquane HH	29/11/19	N/A	15:04	17:05	E3	Nil	95	Good
Kilquane HH	24/12/19	N/A	15:26	16:56	NW3	Nil	25	Good
Kilquane HH	30/01/20	N/A	16:00	18:00	W2	Nil	60	Good
Kilquane HH	25/02/20	N/A	16:30	18:30	W3	Showers	50	Good
Kilquane HH	20/03/20	N/A	17:20	19:20	NE3	Nil	100	Good
Ballyadam	24/12/19	N/A	12:45	13:25	NW2	Shower	90	Good
Ballyadam	17/01/20	N/A	09:35	10:35	W1	Nil	95	Good
Ballyadam	25/02/20	N/A	12:05	11:10	NW3	Shower	85	Good
Ballyadam	20/03/20	N/A	13:45	15:10	E3	Nil	100	Good
Kilquane	24/12/19	N/A	14:10	15:20	NW3	Nil	85	Good
Kilquane	16/01/20	N/A	11:20	12:25	W2	Nil	50	Good
Kilquane	25/02/20	N/A	10:15	11:10	NW3	Shower	85	Good
Kilquane	20/03/20	N/A	10:00	11:05	NE3	Nil	30	Good

Appendix 2

Numbers of walkers and dogs encountered during high tide surveys at Redbarn-Claycastle. Walkers and dogs were not counted during March 2020 surveys.

Redbarn-Claycastle	Nov-19	Nov-19	Dec-19	Dec-19	Jan-20	Jan-20	Feb-20	Feb-20	Mar-20	Mar-20
	Walker	Dog	Walker	Dog	Walker	Dog	Walker	Dog	Walker	Dog
Section 1	1	1	2		5		1		N/C	N/C
Section 2	3	4	12	4	3	2	3	3	N/C	N/C
Section 3			4	1	2		2		N/C	N/C
Section 4	6	2	17	2	3	1			N/C	N/C
Section 5	8	3							N/C	N/C

Numbers of walkers and dogs encountered during low tide surveys at Redbarn-Claycastle.

Redbarn-Claycastle	Nov-19	Nov-19	Dec-19	Dec-19	Jan-20	Jan-20	Feb-20	Feb-20	Mar-20	Mar-20
	Walker	Dog	Walker	Dog	Walker	Dog	Walker	Dog	Walker	Dog
Section 1	2	2	5	4	3	2	3	1	10	5
Section 2	7	5	10	12	4	2	1		5	2
Section 3	12	1	1		2	1	1		5	1
Section 4	6		3	4	6	4	1	1	3	
Section 5	2	1	3	2	3	1	1	1	2	2

Winter Bird Surveys at Youghal/Claycastle in 2020/21

Report prepared for Mott MacDonald by Allan Mee (PhD)

Contents

Introduction

Bird survey work was undertaken over the winter of 2020/21 at Youghal/Claycastle as part of waterbird and raptor monitoring in relation to the proposed Celtic Interconnector undersea cable between France and Ireland. Monitoring focussed on assessing onshore and offshore waterbird numbers as well as raptor use of an important nature conservation site, Ballyvergen marsh. Although the proposed area of operations for the proposed cable is not located on a protected site it is located approximately 1.3km from the nearest Natura 2000 site, Blackwater River Special Area of Conservation (SAC) and at the eastern boundary of a proposed natural Heritage Area (Ballyvergen Marsh pNHA). Thus, monitoring of key bird species, especially those of qualifying interest for Ballymacoda Special Protection Area (SPA) as well as an important winter roost site for Hen Harrier, an Amber listed declining raptor species in Ireland.

Using the standard methodology (Lewis & Tierney 2014), waterbirds were surveyed over a four-hour period centred on high (HT) and low tides (LT). This was timed so that both HT and LT surveys could be completed on the same day each month. In addition, marine bird surveys, at a point centred on the proposed location for the cable, were carried out over a one-hour period at high, mid and low tides on a single day each month to assess bird use within 450m area offshore. Finally, a dedicated vantage point count was undertaken at points overlooking Ballyvergen marsh on a single evening each month to assess use of the site as a winter roost by Hen harrier. These data, and previous survey work at the same site, provide a baseline to accurately estimate bird numbers and bird usage of the proposed development site. Although the survey area for LT and HT bird counts is located adjacent to an important wintering bird area, Ballymacoda SPA, no attempt was made to survey this large and complex site. However, annual waterbird counts (IWEBS) are undertaken each year across all important wetland sites in the Republic of Ireland, coordinated by Birdwatch Ireland (BWI).

Nature Conservation Designations

The location for winter bird surveys at Youghal/Claycastle was adjacent to three Natura 2000 sites: the Blackwater Estuary SPA (site code 004028), Ballymacoda Bay SPA (004023) and the Blackwater River (Cork/Waterford) SAC (site code 002170). A fourth site of importance for nature conservation in the area is the Ballyvergan Marsh pNHA (000078). These sites for nature conservation and the winter waterbird and Hen harrier survey areas are shown in Fig. 1. Only the sites of designated for their ornithological significance (SPAs and pNHA) are described here. The Blackwater River (Cork/Waterford) SAC is a huge site covering much of the course of the Blackwater of which only the immediate Youghal Bay estuary has any significance in relation to the Celtic Interconnector project.

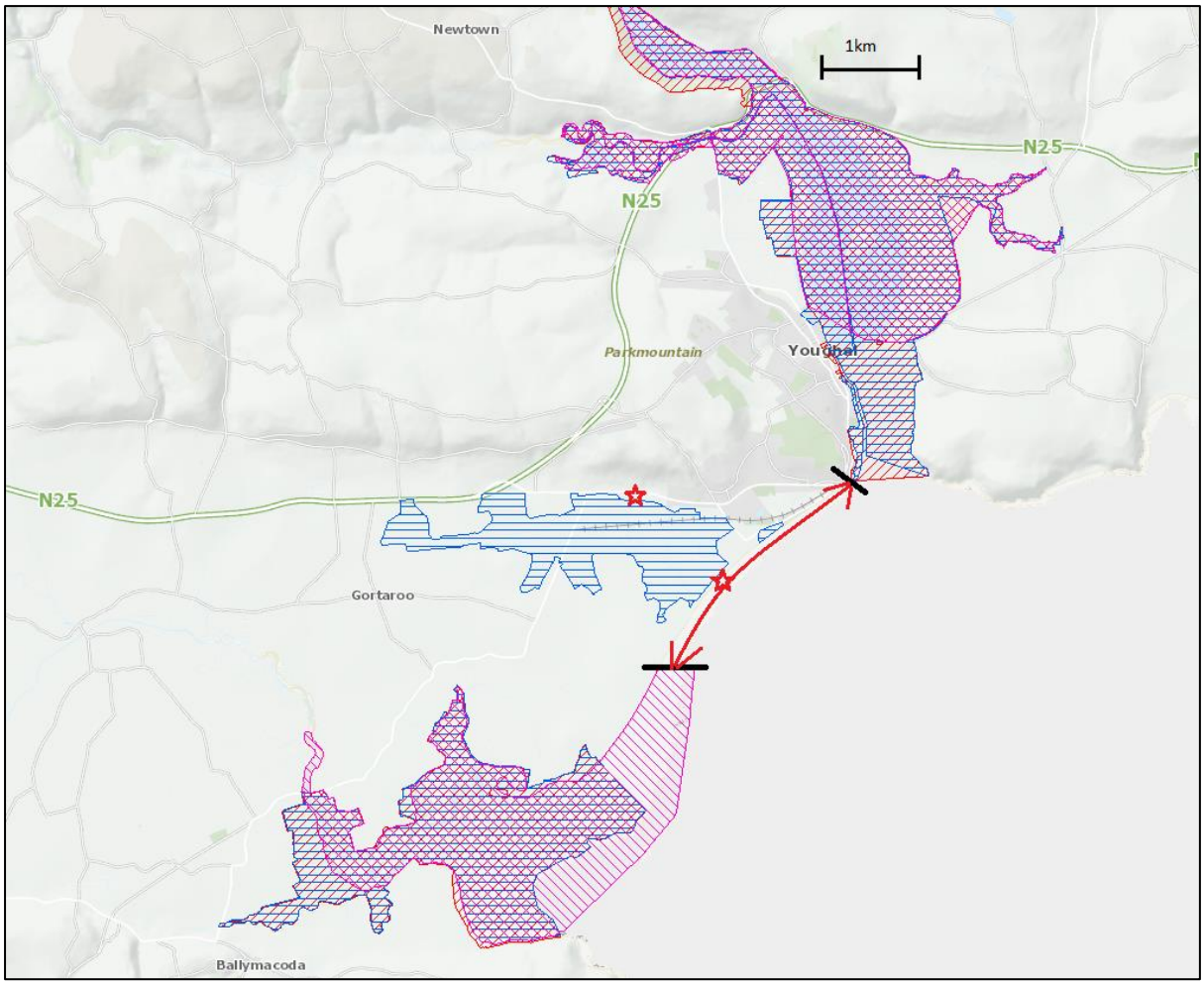


Fig. 1 Youghal/Claycastle winter bird survey area showing survey site in relation to Natura 2000 sites and Ballyvergan marsh pNHA. Hen harrier winter roost vantage points (VP) are shown as stars.

Blackwater Estuary SPA (site code 004028)

The Blackwater Estuary SPA is a relatively small Natura 2000 site located at the mouth of the Blackwater river and extending up the Blackwater River as far inland as Ballynaclash quay, Co. Waterford (Fig. 2). The sites comprises low, intertidal mudflats on both sides of the main channel of the Blackwater. The SPA overlaps with the much larger river catchment that is the Munster Blackwater River (Cork/Waterford) Special Area of Conservation (SAC 002170).

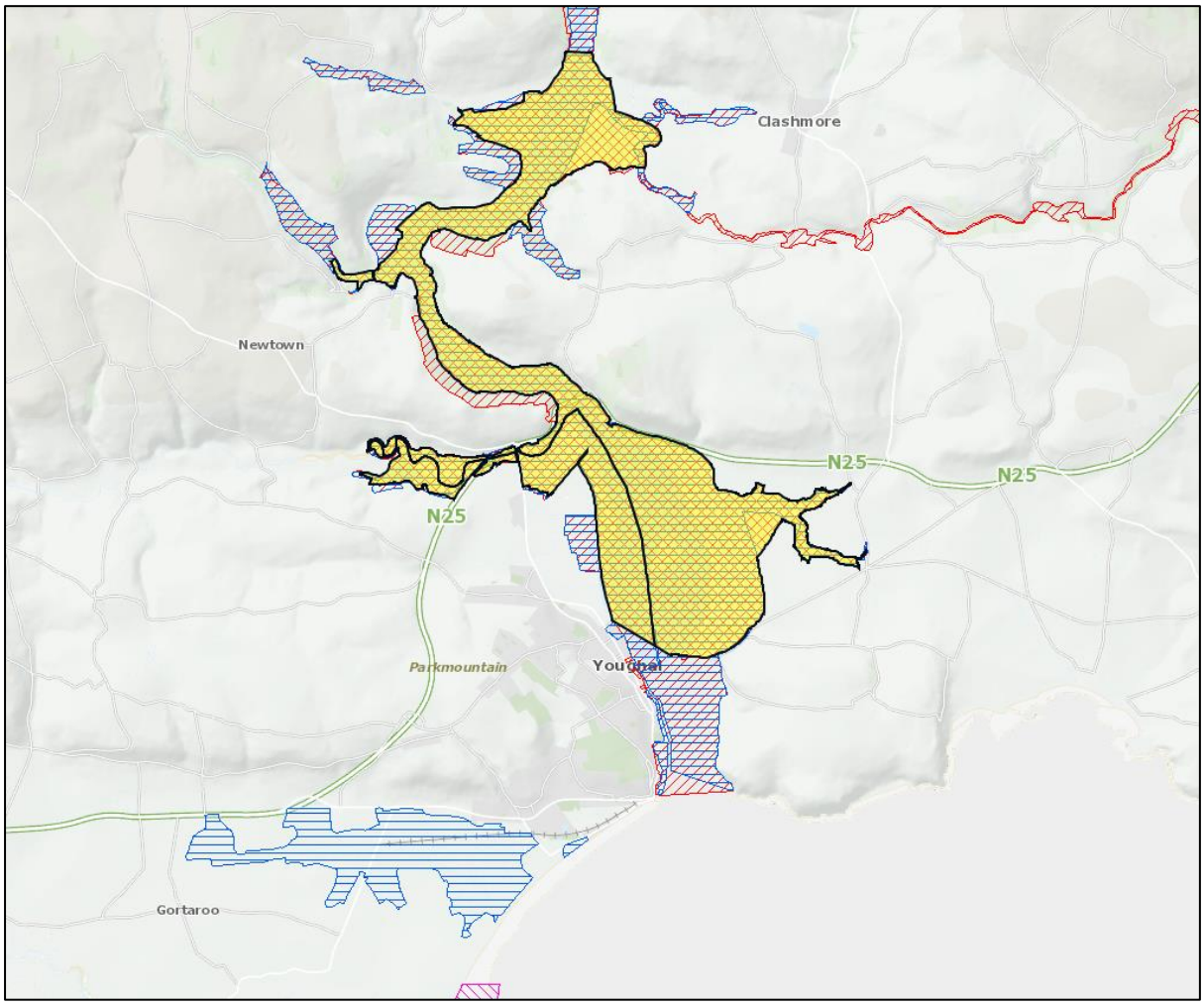


Fig. 2. Location of the Blackwater River SPA (yellow) in relation to the winter bird survey area. Note that the site overlaps with the Blackwater River SAC (pink hatching).

The site is designated a SPA under the EU Birds Directive to protect a suite of wintering waterbirds (Table 1). The Blackwater Estuary is of high ornithological importance for wintering waterfowl, providing good quality feeding areas for an excellent diversity of waterfowl species. At high tide, the birds roost along the shoreline and salt marsh fringe, especially in the Kinsalebeg area. The site supports an internationally important population of Black-tailed Godwit and has a further seven

species with nationally important populations: Wigeon (953), Golden Plover, Lapwing, Dunlin, Bar-tailed Godwit, Curlew and Redshank (Blackwater Estuary SPA site synopsis, NPWS 2012).

Table 1. Qualifying interests for the Blackwater estuary SPA (Crowe 2005, NPWS 2015)

Sp. code	Species	Peak counts (% national pop)	Status
International importance			
A156	Black-tailed Godwit *Limosa limosa*	634 (3.5)	Wintering
National importance			
A050	Wigeon *Anas penelope*	978 (0.9)	wintering
A140	Golden Plover *Pluvialis apricaria*	3,098 (2.1)	Wintering
A142	Lapwing *Vanellus vanellus*	2,761 (1.3)	Wintering
A149	Dunlin *Calidris alpina*	1,882 (1.0)	Wintering
A157	Bar-tailed Godwit *Limosa lapponica*	286	Wintering
A160	Curlew *Numenius arquata*	1,117 (1.6)	Wintering
A162	Redshank *Tringa totanus*	489 (1.5)	Wintering
A999	Wetlands		

Ballymacoda Bay SPA (site code 004023)

Ballymacoda Bay SPA is a complex site is located west of Youghal and holding internationally important populations of wintering waterbirds. The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture (NPWS site synopsis). The site is a Special Protection Area under the E.U. Birds Directive, of special conservation interest for the following species: Wigeon, Teal, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Black-headed Gull, Common Gull and Lesser Black-backed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds (NPWS 2015).

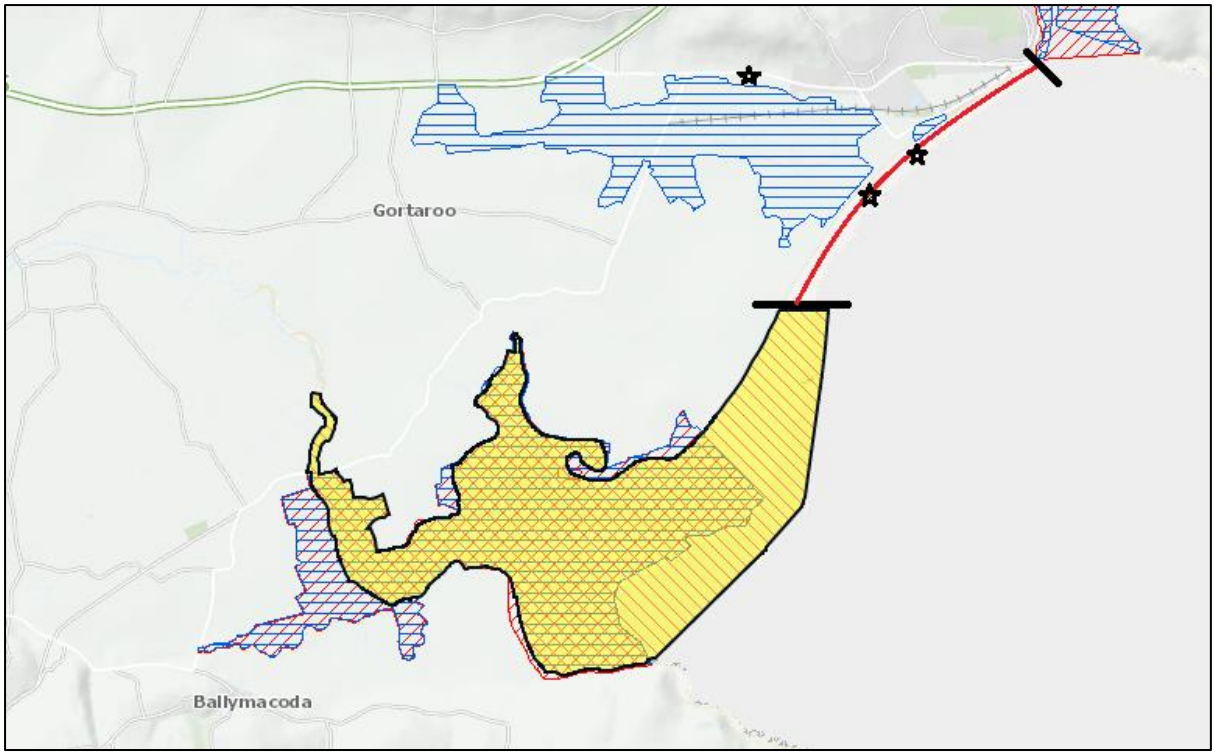


Fig. 3. Location of the Ballymacoda Bay SPA (yellow) in relation to LT/HT bird survey area (red). Note that the site overlaps with Ballymacoda (Clonpriest and Pilmore) SAC (pink hatching).

Ballymacoda Bay is of high ornithological importance for supporting an excellent diversity and large number of wintering waterbirds – it is of international importance because it regularly supports an assemblage of over 20,000 birds. The site provides both feeding and roosting areas for the birds. Furthermore, both Golden Plover (10,920) and Black-tailed Godwit (765) occur here in internationally important numbers (all counts given are mean peaks for the five-year period 1995/96-1999/2000). A further eleven species of waders and ducks occur here in nationally important numbers (Table 2). A total of 107 species were recorded from the site between 1971 and 1988.

Table 2. Qualifying interests for the Ballymacoda Bay SPA (Crowe 2005, NPWS 2012)

Sp. code	Species	Peak counts (% national pop)	Status
International importance			
A140	Golden Plover *Pluvialis apricaria*	10,920	Wintering
A156	Black-tailed Godwit *Limosa limosa*	765	Wintering
National importance			
A050	Wigeon *Anas penelope*	907	wintering
A052	Teal *Anas crecca*	887	Wintering
A137	Ringed Plover Charadrius hiaticula	153	Wintering
A141	Grey Plover Pluvialis squatarola	535	Wintering
A142	Lapwing *Vanellus vanellus*	4,063 (2.0)	Wintering
A144	Sanderling Calidris alba	98 (1.4)	Wintering
A149	Dunlin *Calidris alpina*	3,192	Wintering
A157	Bar-tailed Godwit *Limosa lapponica*	581	Wintering
A160	Curlew *Numenius arquata*	1,145	Wintering
A162	Redshank *Tringa totanus*	357	Wintering
A169	Turnstone Arenaria interpres	137	Wintering
A179	Black-headed Gull Chroicocephalus ridibundus	1,560	Wintering
A182	Common Gull Larus canus	1,120	Wintering
A183	Lesser Black-backed Gull Larus fuscus	5,051	Wintering
A999	Wetlands		

Ballyvergan Marsh pNHA (site code 000078)

Ballyvergan Marsh is located just south of the N25 and immediately west of Youghal, Co Cork. Ballyvergan marsh is one of 630 proposed Natural Heritage Areas (pNHAs) which were published on a non-statutory basis by the NPWS in 1995 but have not since been formally designated (www.npws.ie). The main habitat within the marsh is the extensive area of reedbed which supports an important and expanding population of Reed Warbler *Acrocephalus scirpaceus* as well as being an important wintering area for Hen harrier *Circus cyaneus*. A secondary habitat, described in the Rare Plant Survey of Co. Cork (1992-93), is a clay/sand cliff occurring on the coast adjacent to the marsh. This adds to the interest of the site since it supports a rare species (see below), along with abundant Kidney Vetch

(*Anthylliz vulneraria*) and Red Fescue (Festuca rubra). Growing abundantly on the cliff is Wild Clary (*Salvia verbenaca*), a species described as rare in the Irish Red Data Book (NPWS data).

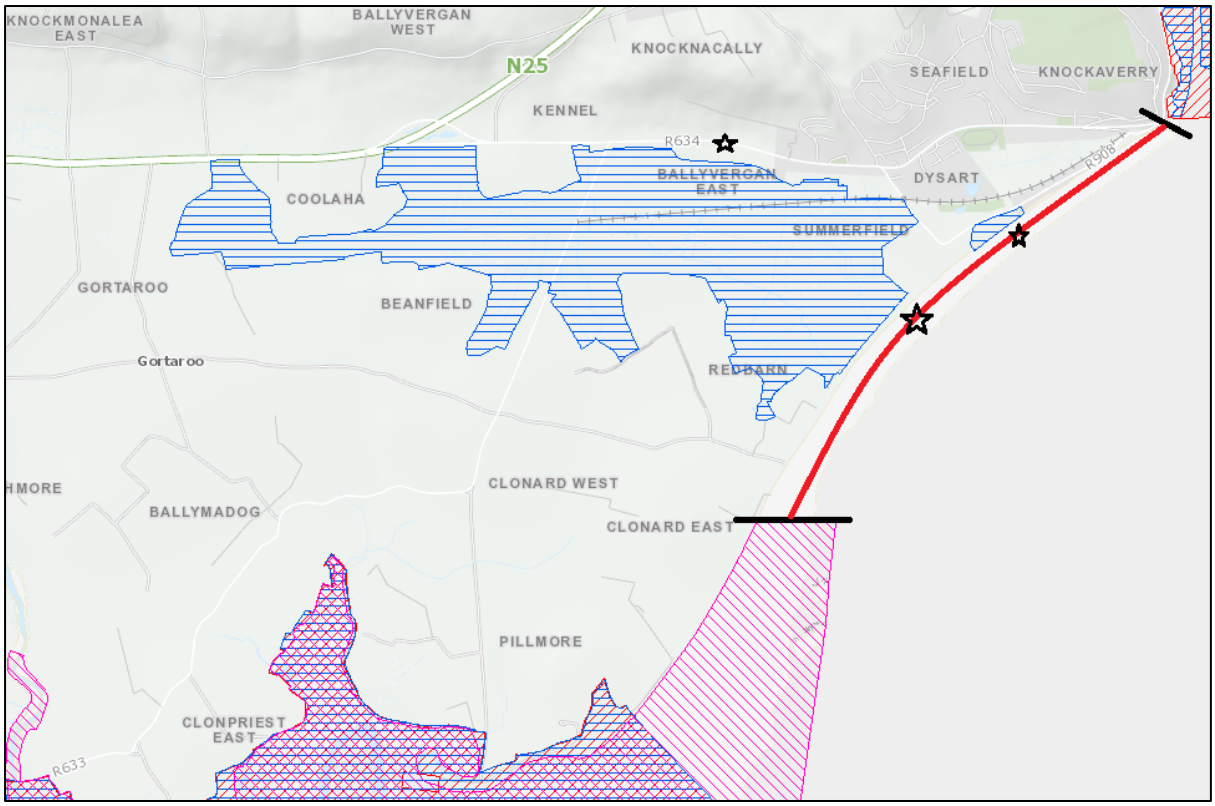


Fig. 4. Location of Ballyvergan Marsh pNHA (blue) in relation to LT/HT bird survey area (red), marine and Hen harrier roost vantage points (star).

The site is the largest coastal freshwater marsh in Co. Cork but is threatened mainly by land reclamation for tourism and agriculture as well as intrusion by salt water at high tides which has led to die off and degradation of the reedbed in sections of the marsh. The disused Midleton to Youghal railway line bisects the marsh and is at present being converted in to a new 22km 'greenway', the first of its kind in Co. Cork which is set to open in 2023.

Waterbird surveys at Youghal/Claycastle

LT & HT waterbird surveys

Wetland bird surveys were carried out at Youghal/Claycastle using the standard IWEBS methodology with the survey period concentrated on a four-hour period, two hours either side of low and high tide (Lewis & Tierney 2014). Both surveys were carried out over a single day each month when daylight hours allowed and tide times were ideal. The survey area has been counted in previous winters (D. Rees, T. Nagle pers. comm) based on a 3.1km stretch of beach extending from Youghal town just beyond Redbarn (Quality Hotel) at its south-western end. At this point the survey area joins the adjacent Ballymacoda Bay SPA at Pilmore. Most of the extent of the survey area is an extensive sandy beach backed up by dunes along much of the shoreline although this has been lost and replaced with rock armouring where the beach joins the town of Youghal. Much of this area if relatedly poor quality foraging habitat for waders until it nears Pilmore where more extensive mud forms attracting flocks of waders and gulls.

Fig. 5 Low and high tide bird survey sections at Youghal/Claycastle beach: Sec 1 Redbarn (inc Redbarn wader fields), Sec 2 Ballyvergen (inc marsh), Sec 3 Claycastle, Sec 4 Caravan park, Sec 5 Youghal town.

As in previous LT and HT surveys the survey area was divided into five sections: 1. Redbarn (including inland fields to the south-west of Ballyvergen marsh), 2. Ballyvergen, 3. Claycastle (car park), 4. Caravan park area, and 5. Youghal town shore-front (Fig. 5). Waterbirds were surveyed by walking a transect from Section 1-5 or vice versa at or near high and low tides around a four-hour window (Lewis & Tierney 2014) and stopping to scan for birds at regular intervals using binoculars (x10) or telescope

(x20-60). Inland fields at the edge of Ballyvergen Marsh were surveyed by walking the section of dunes south-west of Claycastle car park and scanning with a telescope. Birds using these fields were counted in Section 1 (Redbarn) to make counts comparable to previous surveys.

All birds using each section were counted and entered onto a datasheet noting the time each section was started and finished. Birds flying past were not counted until they settled in a section. Every effort was made to avoid disturbing birds by keeping to inshore roads, paths or the top of the beach. Where birds were disturbed (e.g., by walkers, dogs) care was taken to avoid birds being double-counted. All surveys were conducted in suitable weather conditions (good visibility, little or no rain and winds no stronger than Beaufort force 5).

Marine bird surveys

Marine bird surveys were undertaken at Claycastle on one day each month between October and March to estimate birds using both the onshore and offshore marine area. This survey consisted of three one hour counts of all waterbirds using or passing through the site (450m out from vantage point) at high tide, mid-tide and low-tide. The vantage point (VP) used for this survey was located at the N end of Claycastle car park, approximately the location of the proposed landfall (should it be chosen) for the Interconnector (Fig. 6). All birds using an area 450m on either side of the VP and up to 450m offshore were counted. The distance of birds at the most distant point was estimated using a rangefinder and birds flying within that range were counted only. Birds flying past were counted and identified to species where possible (a small number of immature gulls and one flock of waders were classed as unidentified gulls or waders and their numbers added to the totals. Data were also collected on use of the beach by walkers and dogs as these are the most significant disturbance factor for waterbirds at the site. As with other surveys, the time each count period started and ended and weather conditions were noted.

Fig. 6 Marine bird (red) and Hen harrier (yellow) vantage point locations at Youghal/Claycastle and Ballyvergan Marsh.

Hen Harrier Winter Roost Surveys

Surveys for roosting Hen harriers were undertaken one evening/afternoon each month at VPs overlooking Ballyvergan marsh (see Fig. 6). Ballyvergan is an important site for Hen harriers in winter with small numbers of birds visiting the marsh to roost in the reedbeds before dark. Roost surveys took place from an hour before sunset until near dark. Hen harrier flight lines and the time and location of roost sites were mapped. Where possible the roost habitat (reedbed, scrub) was noted. As with other surveys, the time and weather conditions during surveys were recorded. No roost surveys were undertaken in periods of strong wind, heavy rain or poor visibility.

Results

Low and High tide Waterbird surveys

Low tide waterbird surveys at Youghal/Claycastle showed numbers peaking in October, being lowest in mid-winter but increasing again in January (Table 3).

Table 3. Monthly totals of birds recorded on low tide counts at Youghal/Claycastle in winter 2020/21.

Month	Count sections					Monthly total
	1	2	3	4	5	
Oct	941	5	13	17	18	994
Nov	417	0	0	11	0	428
Dec	159	21	22	3	3	208
Jan	541	12	9	14	0	576
Feb	221	18	3	28	6	276
March	170	27	6	1	7	211
Mean	431.2	12.2	9.6	12.4	5.4	174

However, numbers were low away from Redbarn (Sec 1), the section closest to Ballymacoda Bay SPA, were low throughout the winter (Fig. 7).

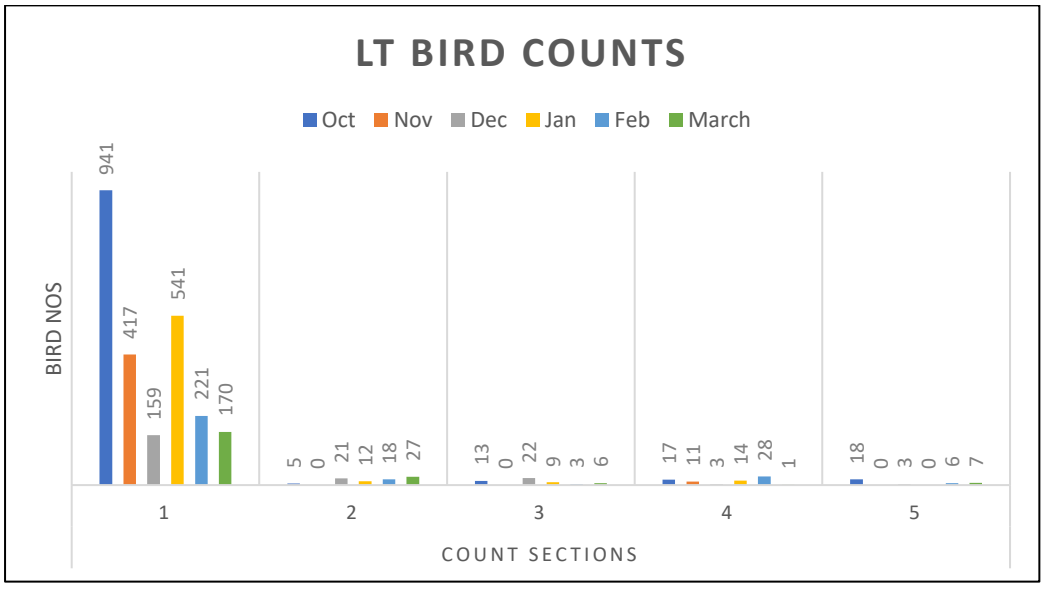


Fig. 7. Monthly bird totals during LT bird surveys at Youghal/Claycastle in winter 2020/21.

High tide waterbird surveys at Youghal/Claycastle showed numbers peaking in early and late winter, but waterbird numbers recorded were low throughout the winter in comparison to low tide totals (Table 4).

Table 4. Monthly totals of birds recorded on high tide counts in each of the five sections at Redbarn-Youghal during the survey period (Oct-Feb ongoing)

Month	Count sections					Monthly total
	1	2	3	4	5	
Oct	41	3	1	0	0	45
Nov	28	2	3	2	0	35
Dec	25	1	1	0	0	27
Jan	7	2	5	2	0	16
Feb	32	3	12	1	0	48
Mar	1	1	0	1	0	5
Mean	22.2	2.0	3.7	1.0	0	174

Like the LT counts numbers again were very low away from Redbarn (Sec 1), the section closest to Ballymacoda Bay SPA (Fig. 8). Some of these low counts may be at least partly explained by the likely greater impact of disturbance on waterbirds on all sections at high tide when the narrow shoreline brings birds in close proximity with walkers and dogs.

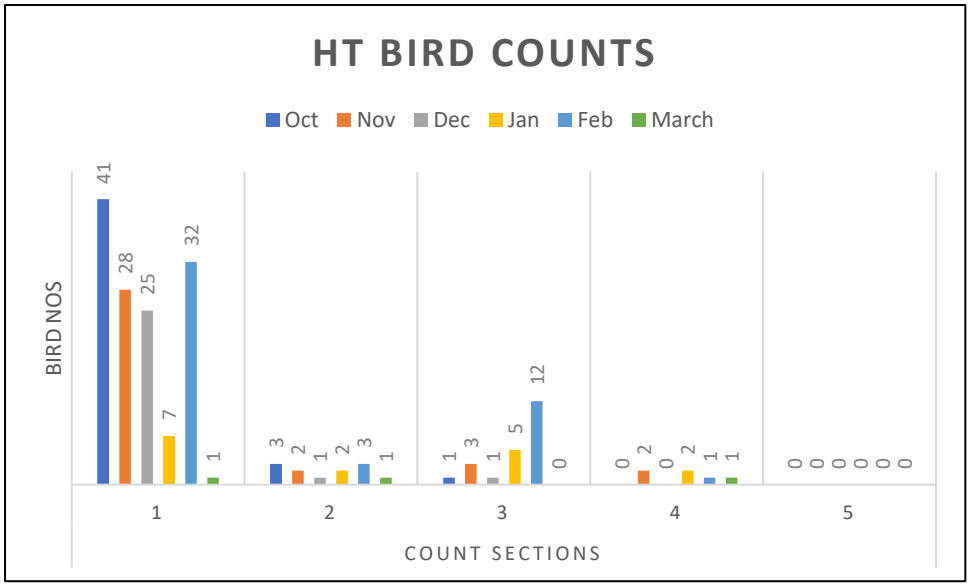


Fig. 8. Monthly bird totals during HT bird surveys at Youghal/Claycastle in winter 2020/21.

A total of 23 waterbird species were recorded during the winter surveys (not inc. Marine surveys) during LT (Table 5) and HT surveys (Table 6).

Table 5. Species totals recorded during LT surveys at Youghal/Claycastle during winter 2020/2021. The most abundant three species are shaded.

Redbarn-Claycastle	**Monthly LT counts**						**% total**
Species	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	
Mute Swan	4	0	0	6	0	2	0.6
Brent goose	10	0	0	0	0	0	0.4
Mallard	0	0	0	0	6	6	0.2
Teal	0	0	20	0	0	10	1.1
Cormorant	9	0	0	0	1	1	0.4
Little Egret	4	0	1	0	0	0	0.2
Oystercatcher	31	5	20	18	27	2	3.8
Ringed plover	0	10	0	14	3	0	1.0
Grey Plover	10	5	0	2	2	0	0.7
Sanderling	254	108	11	15	67	155	22.7
Dunlin	115	0	0	80	0	0	7.2
Redshank	15	2	1	3	1	3	0.9
Turnstone	0	0	5	1	1	0	0.3
Bar-Tailed Godwit	56	160	48	335	75	0	25.0
Curlew	7	109	90	11	67	1	10.6
Mediterranean gull	0	0	0	0	1	0	0.1
Black-headed Gull	368	16	9	27	2	0	15.7
Common Gull	85	10	3	55	7	3	6.1
Herring Gull	24	2	0	6	22	25	2.9
Great Black-backed Gull	0	1	0	0	0	3	0.2
Lesser Black-backed Gull	0	0	0	3	0	0	0.1
Sandwich tern	2	0	0	0	0	0	0.1
Total	994	428	208	576	276	211	2693

Section 1 (Redbarn) was by far the most important section with 2,449 (90.1%) and 134 (77.0%) of all bird recorded in the section on Low and High tide counts respectively. Sanderling, Bar-tailed Godwit and Black-headed gull were the most abundant species on LT surveys, comprising 63% of all waterbirds counted over winter 2020/21 (Table 5). Curlew and Black-headed gull were the most abundant species on HT surveys, comprising 56% of all waterbirds counted over winter 2020/21 (Table 6).

Table 6. Species totals recorded during HT surveys at Redbarn-Youghal during the survey period (Oct-Feb ongoing)

Redbarn-Claycastle	**Monthly HT counts**						**% total**
Species	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	
Mute Swan	0	2	0	0	0	0	1.2
Teal	0	0	0	0	3	0	1.7
Little Egret	0	0	0	0	0	1	0.6
Oystercatcher	0	16	1	0	0	0	9.8
Redshank	0	0	9	0	0	0	5.2
Turnstone	0	0	4	0	0	0	2.3
Curlew	0	0	13	0	32	0	25.9
Black-headed Gull	39	0	0	7	7	0	30.5
Common Gull	1	4	0	4	3	0	6.9
Herring Gull	5	7	0	5	3	2	12.6
Great Black-backed Gull	0	6	0	0	0	0	3.5
Total	45	35	27	16	48	3	174

Marine bird surveys

Marine bird surveys were undertaken at Claycastle each month between October and March. This survey consisted of three hour-long counts of all waterbirds using or passing through the site (450m out from vantage point) at high, mid and low tides. A total of 18 waterbird species were recorded during surveys although not all birds (immature gulls, waders) flying past the site at a distance offshore could be identified to species (Table 7).

Table 7. Species totals recorded during marine (LT, MT & HT) surveys at Youghal/Claycastle during the survey period (Oct 2020 - March 2021).

Species	Oct	Nov	Dec	Jan	Feb	Mar	Total	%
Brent Goose	0	0	2	1	0	0	3	0.21
Common Scoter	4	0	0	0	0	0	4	0.28
Great Northern Diver	0	0	2	1	0	1	4	0.28
Red-breasted Merg	0	0	0	2	0	0	2	0.14
Great-crested Grebe	0	0	18	0	0	0	18	1.28
Cormorant	22	29	16	7	6	13	93	6.60
Shag	0	0	1	1	0	0	2	0.14
Oystercatcher	1	6	4	0	5	2	18	1.28
Ringed Plover	0	55	0	0	0	0	55	3.90
Sanderling	7	0	17	4	14	13	55	3.90
Dunlin	10	0	0	0	0	0	10	0.71
Curlew	0	3	0	0	0	0	3	0.21
Black-headed Gull	27	18	40	14	10	0	109	7.74
Common Gull	30	52	61	49	13	0	205	14.55
Herring Gull	87	140	85	76	78	18	484	34.35
Great BB Gull	48	29	26	46	23	11	183	12.99
Lesser BB Gull	7	42	10	20	1	0	80	5.68
Unid gulls	0	0	11	0	10	0	21	1.49
Unid wader	0	0	0	0	0	60	60	4.26
Total:	243	374	293	221	160	118	1409	100.00

The most abundant species were gulls, especially Herring (34.4% of all birds recorded), Common (14.6%) and Great Black-backed Gulls (13.0%), along with smaller numbers of Cormorant (6.6%), Ringed plover (3.9%), and Sanderling (3.9%). Herring gull occurred in greatest numbers in all months peaking in November and declining greatly in March (Fig. 9).

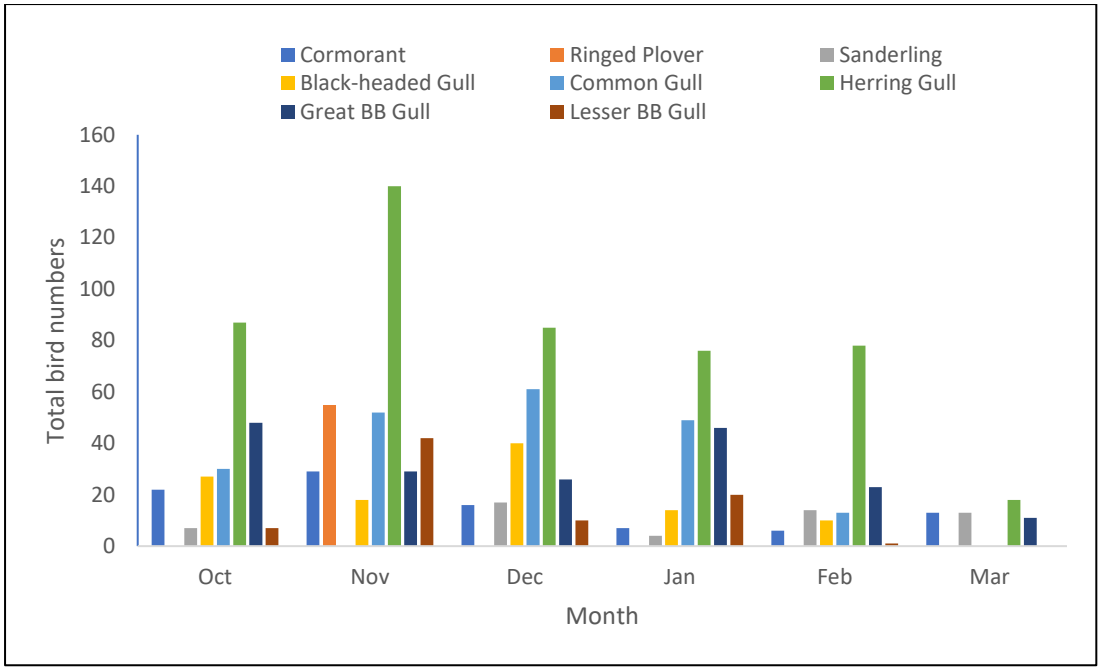


Fig. 9 Total bird counts (all 3 tide periods combined) ay Youghal/Claycastle during the survey period (Oct 2020 - March 2021).

Numbers across all three survey periods combined peaked in early winter and declined into spring (Table 8). Numbers tended to be highest on low and high tides and lowest during the mid tide period.

Table 8. Species totals recorded during marine (LT, MT & HT) surveys at Youghal/Claycastle during the survey period (Oct 2020 - March 2021).

Month	Oct	Nov	Dec	Jan	Feb	Mar	Total	Mean
LT	113	109	126	73	73	14	508	145.1
MT	69	82	89	76	42	17	375	107.1
HT	61	183	78	72	45	87	526	150.3
Totals	243	374	293	221	160	118	1409	402.6

Total numbers of birds varied across the three tide periods and between months (Fig. 10). The higher numbers recorded at high and low tides may indicate the primary times for movement of birds in relation to foraging and roosting although most of the birds recorded were offshore gulls passing through the site as opposed to birds actively using the site for foraging or roosting.

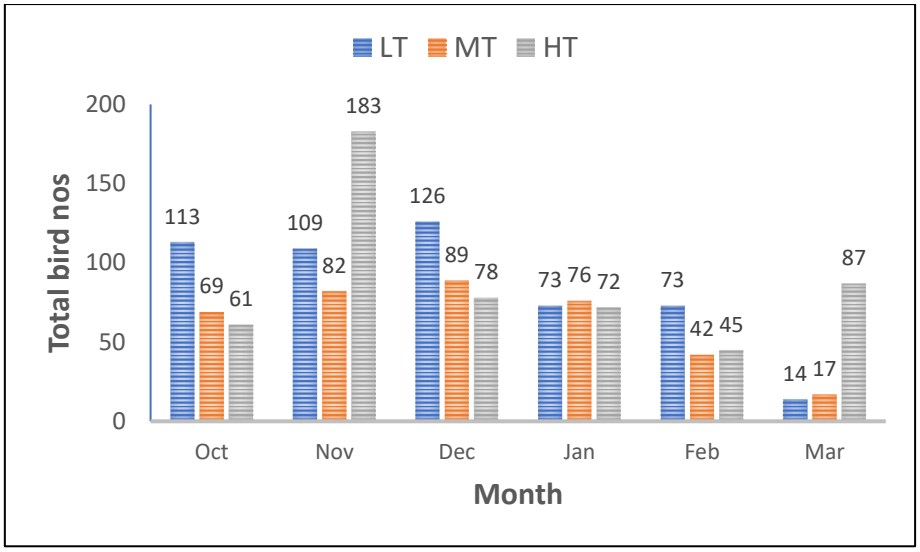


Fig. 10 Total bird numbers at Youghal/Claycastle during the survey period (Oct 2020 - March 2021).

Hen harrier winter roost survey

Hen Harrier winter roost surveys were carried out on single dates, an hour before sunset to dark, at Ballyvergen Marsh between October 2020 and March 2021. Hen harriers were recorded on three of the six winter roost evening watches with a maximum of three birds were recorded on 14 December but no birds were recorded on dates in November, January and February (Table 9). It is likely that these numbers are accurate although a single ringtail (female/juvenile) was seen on three occasions on the date in March although it was considered almost certainly to be the same bird dropping down as if to roost only to move site before finally settling to roost.

Table 9 Number of Hen harriers utilising the Ballyvergen roost (RT refers to ringtail, fem/juv male).

Month	No Hen Harrier	Age/Sex		Notes
		Males	Fem/RT	
Oct	2	0	2	RT in 16:39, down to W of Quality hotel; other RT in 17:07, away again N, did not app roost
Nov	0	0	0	No birds seen
Dec	3	1	2	RT (ad fem) in with male to roost (16:08), down to roost (16:09-16:12); 3rd RT in (16:14), not seen to go to roost
Jan	0	0	0	No birds seen
Feb	0	0	0	No birds seen
Mar	1	0	1	RT (ad fem) in over reedbed, down (18:32), apparently up again and later (18:50) down to roost at usual site to S of old railway line

Other raptors using Ballyvergen marsh to hunt over or perch in included Common Buzzard (singles in Oct, Nov and January) and Kestrel (singles in October, January and March). Small numbers of duck (including up to 100 Teal) were regular which up to 90 Curlew roosted on one of the main channels in December (Table 10).

Fig. 11 Location of Hen Harrier roost at Ballyvergan marsh in winter 2020/21. The location is somewhat variable depending on month and birds. The main roost location is approx. 800m from the proposed route at its closest point.

Table 10 Use of Ballyvergen marsh by raptors and other species of conservation concern during Hen Harrier roost surveys in winter 2020/21.

	Oct	Nov	Dec	Jan	Feb	Mar
Raptors						
Hen harrier	2	0	3	0	0	1
Buzzard	2	1	0	1	0	0
Kestrel	1	1	0	1	0	1
Other species						
Mute Swan				6		2
Little Egret			1			
Curlew			90	6	50	
Teal		100				10
Mallard						6

Discussion

LT and HT Waterbird surveys

Both during LT and HT surveys, Section 1 (Redbarn) was by far the most significant site for waterbirds with relatively low numbers recorded on other sections throughout the winter. Numbers varied greatly in Section 1 between months, peaking in October. Very few birds were recorded away from Sections 1 and 2 on high tide counts, at least partly due the high levels of recreational use of the beach, especially those nearest Youghal town and Claycastle car park. Work on the new section of boardwalk from Claycastle to Redbarn was ongoing throughout the count period and may have impacted on bird numbers in Section 2, with diggers and quads active on the beach during construction. However, much of the transect habitat is largely sandy beach unlikely to attract large numbers of waders even without disturbance, with the exception of Sanderling and smaller numbers of other wader species (Oystercatcher, Turnstone). As Section 1 (Redbarn) holds more heterogenous habitats including some mudflat and rocky shore at low tide this presents more diverse foraging opportunities for waders. This undoubtedly explains the relative importance of this section for wintering waterbirds, especially Bar-tailed Godwit and indeed Sanderling, although recreational disturbance is also somewhat lower in this section. It should be noted that the Quality Hotel (Redbarn) was closed throughout the survey period due to Covid restrictions. Thus, there may have been less disturbance in Section 1 during winter 2020/21 than in previous winters. Section 1 (Redbarn) also undoubtedly held the bulk of the species and birds recorded due to its proximity to Ballymacoda Bay SPA, a site of national and international importance for a number of wintering waterbird species.

By late winter numbers on both low and high tide counts had declined from a peak in October. Thus, the low numbers recorded in Sections 2-5 and the distance of the most important section (Redbarn) from the site of landfall for the cable route make it unlikely that the proposed route and works would impact significantly on wintering waterbirds. Further, many of the key species of conservation concern are present only as passage (migrant) or wintering birds with much lower numbers present in summer. However, a number of bird species of conservation concern (e.g., Teal, Curlew, Hen Harrier) use Ballyvergan marsh for roosting or foraging throughout the winter and are more vulnerable to disturbance/displacement due to the proposed works (see Conclusions). Waterbirds surveys have shown that Section 1 holds an important wintering populations of waterbirds, numbers of which are of national importance although these counts only refer to a single winter. Birds in this area are largely birds that forage here as part of the greater Ballymacoda Bay SPA wintering populations. These included three Annex I species and five species of high conservation concern (red-listed) in Ireland (Table 10). Most important were the numbers of Bar-tailed Godwit, a species of medium conservation concern (Amber listed) in Ireland for its significant but declining wintering population (Table 10).

Table 10. Species of conservation concern recorded at Youghal/Claycastle during waterbird surveys (LT & HT counts) and significance of counts in relation to the Irish Wintering Population (IWP). IWP estimates are derived from Burke et al. (2019)**. Birds of Conservation Concern in Ireland (BoCCI) are derived from Gilbert et al. (2021)*.

Species of Conservation Concern	Annex	BoCCI*	Max count	Irish Winter Ref Pop**	% of IWP
Mute Swan		B/W	6	9130	0.07
Pale-bellied Brent		W	10	35150	0.03
Teal		B/W	20	35740	0.06
Cormorant		B/W	9	10870	0.08
Little Egret	I	LC	4	1390	0.29
Oystercatcher		B/W	31	60540	0.05
Grey Plover		W	10	2940	0.34
Sanderling		LC	254	8,420	3.02
Ringed Plover		B/W	14	11,660	0.12
Dunlin	I	B/W	115	45760	0.25
Redshank		B/W	15	23800	0.06
Turnstone		W	5	9,480	0.05
Bar-tailed Godwit	I	W	335	16530	2.03
Curlew		B/W	109	35240	0.31
Black-headed Gull		B/W	368		
Common Gull		B/W	85		
Herring Gull		B/W	25		
Great Black-backed Gull		B/W	6		
Lesser Black-backed Gull		B/W	3		

Of the three Annex I species recorded, the most important was the significant number of Bar-tailed Godwit (see Table 5). This species use of the site was confined to the Redbarn (Sec 1) area on the edge of Ballymacoda Bay SPA. No Dunlin were recorded in any of the other four sections and the area where birds were located was some distance (1.8km) from the site of the proposed construction/cable laying area at Claycastle. Thus, it is considered that the current proposed site for laying the Interconnector cable will be at sufficient distance to have no impact on godwit numbers and it's use of the site for foraging in winter. The All-Ireland population estimate for this species is 16,530 (Burke *et al* 2019) and the January count represents 2.03% of the All-Ireland population based on this estimate. Although this number is above the 1% threshold by which the site would be of national importance if such numbers were to be recorded consistently over a 5 year period, the birds recorded were on the edge of Ballymacoda Bay SPA and their use of the site did not extend significantly beyond this.

Another wader with an important wintering population was Sanderling. Although classed as Least Concern, peak counts for this species were greater was also the 1% threshold during three of the six survey months (October, November and March). Although most Sanderling were recorded from Section 1 (Redbarn) small flocks occurred in all sections during some counts. However, human disturbance from walkers and dogs was consistently high during counts in the sections nearest Youghal town (Sections 5 to 2) during LT surveys. Sanderling did not occur in any of these sections at high tide

when the stretch of beach available to any foraging birds is very narrow and birds would have been consistently disturbed by walkers. Laying of the cable at the proposed site would temporarily displace the small flock/s of Sanderling in that section of the beach towards the Redbarn (Sec 1) area, where most of the Sanderling recorded here occurred. Likewise, small flocks of Dunlin, anther Annex I species, were seen in October (115) and January (80) but not recorded on other surveys. This species use of the site was confined to the Redbarn (Sec 1) area on the edge of Ballymacoda Bay SPA. No Dunlin were recorded in any of the other four sections and the area where birds were located was some distance (1.8km) from the site of the proposed construction/cable laying area at Claycastle.

In addition to the species referred to above, an additional four red-listed species were recorded during the winter surveys: Redshank, Curlew, Oystercatcher and Grey Plover. Very small numbers of Redshank (maximum 15) were recorded during the count period and Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species and any potential disturbance caused at this site by pipe-laying activities. Curlew were recorded in all months with a peak figure of 109 in November. Most curlew were recorded mainly foraging in the fields west of Ballyvergan marsh (approximately 850m southwest of the proposed Interconnector route). Birds were also recorded roosting within the marsh within the main channel some 450m west of the proposed route (90 during HH roost surveys). Birds using this site may be temporarily disturbed during the cable laying process but are likely to relocate elsewhere in Ballyvergen or to the Ballymacoda SPA. Both Oystercatcher and Grey Plover occurred in small numbers although the former would likely use the beach survey area in higher numbers in the absence of human disturbance while the latter only occurred at the Pilmore end of Section 1 (Redbarn), in proximity to Ballymacoda Bay SPA. Oystercatcher utilise the sections of beach closest to the proposed cable route in small numbers. Although Oystercatcher would be displaced during the works phase the small number of this species present would likely temporarily relocate further along the shoreline and into Ballymacoda SPA until the source of disturbance has ended. Gull species using the Youghal/Claycastle area include the amber-listed Black-headed Gull and Herring Gull. Numbers of both gulls were low throughout the winter apart from the peak count of 368 Black-headed Gulls in October. As wintering birds both gull species are unlikely to be disturbed by any works relating to the laying of the cable and indeed non-breeding gulls are well known to be opportunistic foragers attracted to human activity.

Other species of conservation interest included the amber-listed Teal. A flock of some 100 birds were recorded in Ballyvergen marsh within 400m of the proposed cable route although this was significantly higher than all previous numbers counted (up to 20). Undoubtedly a population of teal occur here in winter but are difficult to survey accurately without flushing birds from the drains and channels where they spend much of the day well hidden. Other amber-listed waterbirds, including Mute Swan, Pale-bellied Brent Geese, Cormorant, Common and Great Black-backed Gulls were recorded in small numbers.

Marine bird surveys

Marine bird surveys across the three one-hour periods at low, high and mid tides were aimed at quantifying bird numbers during timed periods, including offshore birds (e.g., common scoter, shag) unlikely to be recorded during the LT and HT counts. Gull species dominated the numbers of birds recorded with smaller numbers of waders and other waterbirds. Interestingly, the mid-tide period between low and high tides held the fewest birds. This may be because bird numbers peak in the period around low tide when almost all wading birds are actively foraging. The higher numbers at high tide might be explained by birds being displaced by incoming tides and/or flying to high tide roost sites. Numbers were highest in the first three months of winter and declined in late winter (Table 7).

The most significant bird species recorded during marine bird surveys were the red-listed Common Scoter, Dunlin and Curlew, all in very low numbers, although higher numbers of the latter two were recorded during the LT and HT surveys (Table 11). The high count of Ringed Plover (55) included single flocks of 50 (HT count) and 5 (MT count). Note that combined counts of birds across the three count periods may be duplicate counts of some of the same birds using the same stretch of inshore and offshore beach and sea.

Table 11. Species of conservation concern recorded at Youghal/Claycastle during marine bird surveys (LT, MT & HT counts). Birds of Conservation Concern in Ireland (BoCCI) are derived from Gilbert et al. (2021)*.

Species of Conservation Concern	Annex	BoCCI*	Max count
Common Scoter		B/W	4
Great Northern Diver		W	2
Red-breasted Merganser		B/W	2
Great-crested Grebe		B	18
Cormorant		LC	29
Shag	I	B	1
Oystercatcher		B/W	6
Ringed plover		B/W	55
Sanderling			14
Dunlin	I	B/W	10
Curlew		B/W	3
Black-headed Gull		B/W	40
Common Gull		B/W	61
Herring Gull		B/W	140
Great Black-backed Gull		B/W	48
Lesser Black-backed Gull		B/W	42

The red-listed bird species recorded, Common Scoter, Dunlin and Curlew were all recorded in small numbers and only in flight offshore passing the vantage point at Claycastle, rather than actively using

the area to forage. Likewise, the Annex I Shag was only recorded in flight some distance offshore as were the Ringed Plover. The predominant species recorded, all gulls, are unlikely to adversely impacted by the construction and cable laying work at Claycastle. Gulls are highly adaptable away from breeding sites and are likely to move temporarily in response to human activity and return quickly if displaced at all.

Hen harrier roost surveys

Up to three Hen Harriers were recorded using the winter roost at Ballyvergan marsh during the survey period (Table 12). This is an important site for this amber-listed species which has been declining in Ireland for much of the past 10-15 years (Ruddock et al. 2016). Although numbers are small at the site this may still account for some 1% of the Irish wintering population and is geographically important as one of only two known roost sites for the species in East Cork.

Table 12. Species of conservation concern recorded at Youghal/Claycastle during marine bird surveys (LT, MT & HT counts). Birds of Conservation Concern in Ireland (BoCCI) are derived from Gilbert et al. (2021)*.

Species of Conservation Concern	Annex	BoCCI*	Max count
Kestrel		B	2
Hen Harrier	I	B	3
Buzzard		LC	2

The main roost site at Ballyvergan is located approximately 800m from the nearest point to the proposed pipe/cable route. Hen Harriers are sensitive to disturbance at roost and every effort should be made to minimise noise levels and night-time work including lighting during construction.

Effects of disturbance on waterbirds at Youghal/Claycastle

Youghal and Redbarn beaches are highly popular for a range of activities from walking, jogging, swimming to kite-surfing. This may have been intensified during the survey period due to the restrictions associated with Covid-19 when local people would have largely using the these beaches for exercise. On the other hand day-trippers or longer term holidaymakers from outside the area would have been greatly reduced for most of the period due to restrictions on non-essential travel outside of 5km of home. However, it was clear during the winter surveys that disturbance to birds across all sections (1-5), especially in the sections nearest Youghal town (Secs 5-2), were intense except in periods of bad weather or when low tide occurred very early in the day before most use of the beaches commenced. An additional disturbance factor was the construction of a boardwalk between Claycastle and Redbarn. This was ongoing throughout the survey period and was still to be completed by March 2021. During this period this stretch of beach (Secs 1-3) were used by quads, a

digger and four-wheel drive vehicles for transporting material. However, this work was largely confined to the upper section of beach next to the dunes separating Claycastle-Redbarn from Ballyvergen marsh and probably had little impact on bird use of this section at low tide when the area for foraging by wading birds would have been most extensive. During the incoming tides (mid-tide to high tide and vice versa) the space available for foraging waterbirds was greatly reduced to a narrow stretch of beach where birds would have been in close proximity to recreational users (mainly walkers and dogs) and construction crews (boardwalk). Thus, bird numbers and species diversity were much lower at high tide compared to low tide during the HT and LT surveys. While this trend, for lower bird numbers and species diversity, may not have been reflected by results of the marine bird surveys this is probably at least partially explained by the low numbers of wading birds that use the Youghal/Claycastle area (Sections 2-4) and the fact that most birds recorded were gull species which are highly tolerant of human disturbance in winter, including birds offshore than would not have been impacted by onshore disturbance factors.

Beach use by recreational walkers, joggers and their associated dogs appeared to most intense during low-mid tide periods which would have coincided with the most intense foraging periods for waterbirds, mainly wintering waders (Table 13).

Table 13. Recreational use by people (walkers, joggers) of Claycastle beach and dogs over a one hour observation period in winter 2020/21.

Month	Tide	Time	Beach users	
			People	Dogs
October	LT	0955-1055	55	6
November	MT	1140-1240	49	11
	LT	1415-1515	17	1
February	HT	0955-1055	7	8
	MT	1235-1335	68	7
	LT	1545-1645	113	11
March	HT	0930-1030	61	16
	LT	1430-1530	64	18
	MT	1645-1745	71	15
Mean			51.6	10.3
St. Dev.			30.98	5.43

At high tides much of the beach is very restricted as the tides approach the dune system and many walkers and dogs use the area behind the dunes on the edge of Ballyvergen marsh at this time. Thus, the high level of beach use at low tide undoubtedly displaces wading birds, typically Oystercatcher and Sanderling, off large sections of beach during daylight hours. Most walkers with dogs did not control pets by restraining them on a lead. Thus, birds were often repeatedly displaced by dogs where they did attempt to feed. Sanderling were typically the most tolerant of close human approach (to <50m) but even so were often flushed to different sections of beach after a few minutes.

Conclusions

Winter surveys carrier out at Youghal/Claycastle in winter 2020/21 showed that the area, in particular the Redbarn section, was important for wintering waterbirds, especially Bar-tailed Godwit and Sanderling. Both these species occurred in numbers greater than the 1% threshold although over a shorter time period than would be required for identification as a site of national importance. Both species, and other waders in particular, occur in nationally (and also internationally) important numbers and are legally protected within the adjacent Ballymacoda Bay SPA. Given the distance of the proposed landfall (1.8km) for the Celtic Interconnector this provides a good buffer to minimise disturbance to these key species (Table 14). Sanderling were found in smaller numbers in sections close to Claycastle and would undoubtedly be displaced temporarily by pipe/cable laying works within the immediate work area. Curlew also occur in good numbers in winter and this red-listed species (Near-threatened globally, classed as Vulnerable in Europe) is susceptible to high levels of noise disturbance. The species used fields at the west end of Ballyvergen marsh (850m west of proposed landfall) as well as channels within the marsh to roost (450m from proposed landfall).

Table 14. Species of primary importance for conservation and/or occurring in important numbers in the Youghal/Claycastle area in relation to the proposed landfall suite for the Celtic Interconnector.

Species of Conservation Concern	Annex	BoCCI*	Max count	Dist to proposed works	% of IWP
Waterbirds					
Teal		B/W	100*	450	0.06
Oystercatcher		B/W	31	-	0.05
Sanderling		W	254	-	3.02
Ringed Plover		B/W	14	1800	0.12
Dunlin	I	B/W	115	1800	0.25
Redshank		B/W	15	1800	0.06
Bar-tailed Godwit	I	W	335	1800	2.03
Curlew		B/W	109	450-850	0.31
Raptors					
Hen harrier		B	3		

*During HH roost survey, not during LT/HT surveys

Likewise, Hen harrier are a species of conservation concern (Amber listed) using the nearby Ballyvergen marsh as a winter roost site. Although not recorded in all months, up to three birds used the site as an overnight roost, roosting in reedbed approximately 800m from the proposed landfall/works. This species has been declining as a breeding bird in the Republic of Ireland in the last 10 years (Ruddock et al. 2016). Although much less is known about the species winter ecology the conservation of winter roost sites is undoubtedly important.

While machinery and human activity during the proposed period of laying the pipeline/cable is likely to displace wading birds within 250m proximity of the site, noise levels may be a bigger factor in displacement and disturbance. Species susceptible to high noise levels and occurring within close proximity to the site (<500m) are likely to be most vulnerable. These include Teal, Oystercatcher,

Curlew and Hen harrier. Although Hen harrier roost beyond 500m high levels of noise activity (and potentially lighting at night in winter) could displace birds away from the current roost site. Bar-tailed Godwit and other waders are likely to be well outside any zone of disturbance. Gulls, while occurring at the proposed site, are unlikely to be seriously impacted and are tolerant of human activity away from breeding sites.

Possible mitigation measures include reducing noise levels and stopping works pre-dusk to avoid disturbance of roosting Hen harrier (Table 15). High intensity and high range lighting in winter may also displace birds within Ballyvergen marsh and should be avoided or reduced where possible. Reducing any negative impact on the reedbed and other habitat within Ballyvergen marsh as well as any possibility of fuel or other leaks associated with the use of high power machinery need to be strictly avoided.

Table 15. Disturbance factors and possible mitigation measures for wintering waders and raptors on conservation concern in proximity to the proposed landfall suite for the Celtic Interconnector.

Species of Conservation Concern	Dist to proposed works	Vulnerability to disturbance	Disturbance factor	Mitigation
Waterbirds				
Teal	450	High	Noise	Reduce noise levels, avoid work at night and/or within marsh
Oystercatcher	-	High	Visual, noise	
Sanderling	-	Mod		
Curlew	450-850	High		
Raptors				
Hen harrier		High	Noise	Daytime only work, no lighting, noise at night from 30 mins before dusk

References

Burke, B., Lewis, L.J., Fitzgerald, N., Frost, T., Austin, G. & Tierney, D. 2019 Estimates of waterbird numbers wintering in Ireland, 2011/12–2015/16. *Irish Birds*, *11*, 1-12.

Crowe, O. 2005. Ireland's Wetlands and their Waterbirds: Status and Distribution. BirdWatch Ireland, Newcastle, Co. Wicklow.

Gilbert G., Stanbury A. & Lewis L 2021. "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

Lewis, L. J. & Tierney, T. D. 2014 Low tide waterbird surveys: survey methods and guidance notes. Irish Wildlife Manuals, No. 80. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

NPWS 2012. Conservation Objectives: Blackwater Estuary SPA 004028. Version1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS 2015. Conservation Objectives: Ballymacoda Bay SPA 004023. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. 2016. The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.