

# NATURA IMPACT STATEMENT

## The Burrow: CFERM Scheme



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Scheme  
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# 1 INTRODUCTION

This Natura Impact Statement (NIS) has been prepared by RPS on behalf of Fingal County Council (FCC). This report is intended to assist An Coimisiún Pleanála in its role as a Competent Authority, to fulfil its duties in accordance with European Communities (Natural Habitats) Regulations (S.I. No. 94 of 1997) under Regulation 31 (Annex 1.2). It has been prepared to accompany an application by FCC for development consent and provides information to allow An Coimisiún Pleanála to determine whether, in view of best scientific knowledge and applying the precautionary principle, the Proposed Development, either individually or in combination with other plans or projects, may adversely affect the integrity of any European site(s). The legal context under which the assessment will be carried out is outlined in Section 1.1.2.

## 1.1 Appropriate Assessment

### 1.1.1 The Habitats Directive

With the introduction of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) came the obligation to establish the Natura 2000 network of Sites of Community Interest (SCIs), comprising a network of areas of highest biodiversity importance for rare and threatened habitats and species across the European Union (EU).

The Natura 2000 network of sites comprises Special Areas of Conservation (SACs, including candidate SACs) designated under legislation transposing the obligations under Directive 92/43/EEC, and Special Protection Areas (SPAs, including proposed SPAs) classified under the Birds Directive (Directive 2009/147/EC on the conservation of wild birds) and designated under Irish legislation. SACs and SPAs make up the pan-European network of Natura 2000 sites in Ireland and they are referred to as European sites.

SACs are designated for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are designated for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is designated correspond to the Qualifying Interests (QIs) of the sites in the case of SACs and Special Conservation Interests (SCIs) of the sites in the case of SPAs. From these qualifying features, the Conservation Objectives (COs) of the site are derived.

A key protection mechanism in the Habitats Directive is the requirement to subject plans and projects to Appropriate Assessment (AA) in line with the requirements of Article 6(3) of the Habitats Directive, which 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. 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.*

Thus, Article 6(3) defines a step-wise procedure for considering plans and projects:

- The first part of this procedure consists of a preliminary 'screening' stage to determine whether, firstly, the plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by the first sentence of Article 6(3).
- The second part of the procedure, governed by the second sentence of Article 6(3), relates to the appropriate assessment and the decision of the competent national authorities.

## 1.1.2 National Context

In the context of the Proposed Development, the requirement (to screen) for AA under the Habitats Directive is transposed by the Planning and Development Acts (2010 to 2018 as amended); ‘the Planning Acts’, and the Planning and Development Regulations (2010 to 2018, as amended).

Under Section 177U (5) of the Planning and Development Acts 2000-2010, as amended (‘the Planning Acts’), the competent authority shall determine that an AA of a Proposed Development is required if it cannot be excluded, 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).

Under Section 177V (2) the competent authority shall take into account each of the following matters in their AA determination:

- a. The NIS (defined below);
- b. Any supplemental information furnished in relation to an NIS;
- c. If appropriate, any additional information sought by the planning authority and furnished by the applicant in relation to a NIS;
- d. Any additional information furnished to the competent authority at its request in relation to a NIS;
- 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; and
- g. Any other relevant information.

Under the Planning Acts (177T), an 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*”.

## 1.1.3 Screening for appropriate assessment

Section 177U of the PDA requires inter alia that a screening for appropriate assessment of an application for consent for Proposed Development shall be carried out by the competent authority 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 on a European site.

While the provisions of section 177U adopt the terminology used in Article 6(3) of the Habitats Directive in terms of the test for screening, section 177U expands on this in light of the interpretation given in decisions of the Court of Justice of the European Union. Thus, section 177U gives effect to the requirement to screen an application for development consent for appropriate assessment by assessing whether the Proposed Development is likely to have a significant effect on a European site by considering whether such a significant effect can or cannot be excluded.

## 1.1.4 Appropriate Assessment (AA)

Section 177V of the PDA requires inter alia that an appropriate assessment carried out by the competent authority shall include a determination under Article 6(3) of the Habitats Directive as to whether or not a Proposed Development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority where it has made a determination under section 177U(4) that an appropriate assessment is required, before consent is given for the Proposed Development.

### 1.1.5 Step-wise procedure

According to European Commission guidance documents ‘Assessment of plans and projects significantly affecting Natura 2000 sites’ (EC, 2021) and the ‘Managing Natura 2000 sites: The Provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC’ (EC, 2019), the obligations arising under Article 6 establish a step-wise procedure for Habitats Regulations Appraisal as follows, and as illustrated in Figure 1.1.

The first part of this procedure consists of a pre-assessment stage (‘screening’) to determine whether, firstly, a plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site either alone or in combination with other plans or projects; it is governed by the first sentence of Article 6(3).

The second part of the procedure, governed by the second sentence of Article 6(3), relates to the appropriate assessment and the decision of the competent national authorities.

A third part of the procedure (governed by Article 6(4)) comes into play if, despite a negative assessment, it is proposed not to reject a plan or project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

The extent to which the sequential steps of Article 6(3) apply to a given plan or project depends on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of a Stage 1 screening appraisal is that significant effects on European sites can be excluded, there is no requirement to proceed to the next step.

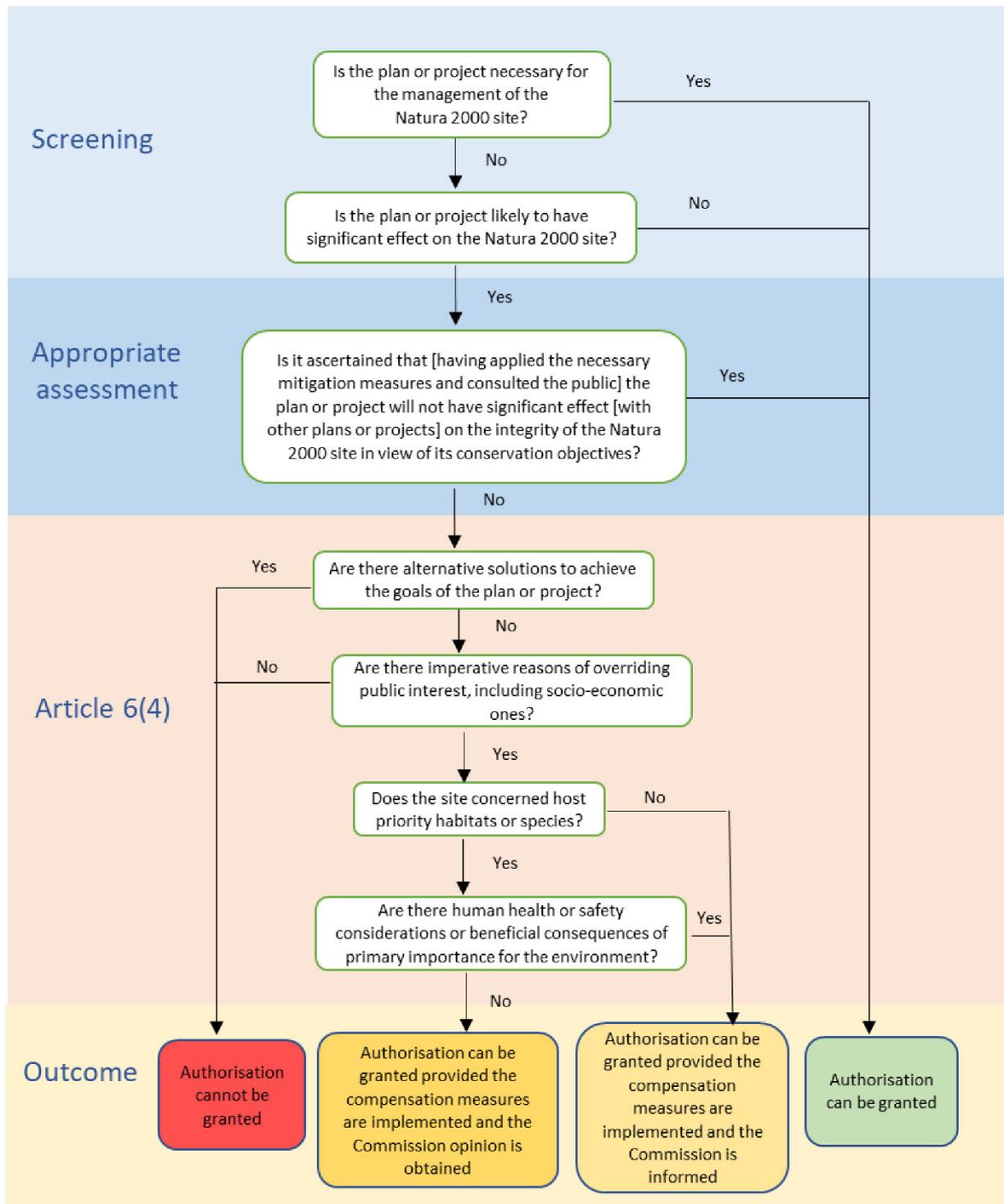


Figure 1.1: Step-wise procedure of Article 6 of the Habitats Directive (from EC, 2021)

## **1.2 Document Structure**

### **1.2.1 Objective of the Document**

The purpose of this NIS document is to provide the competent authority with information to assist them in carrying out an assessment of the implications of the proposed coastal defence and beach nourishment project at the Burrow on European sites in view of their conservation objectives.

This document has been prepared on behalf of Fingal County Council in support of an application to An Coimisiún Pleanála for planning consent and is intended to assist An Coimisiún Pleanála under the Planning Acts and the DHLGH as public authorities under the 2011 Regulations, in fulfilling their obligations to conduct an appropriate assessment.

### **1.2.2 Methodology and Guidance**

Section 2 of this NIS report sets out the methodology and guidance documents used in conducting an appraisal for appropriate assessment of the implications of the Proposed Development on European sites.

### **1.2.3 Proposed Development**

Section 3 of this NIS report describes the Proposed Development, the general methodology sequence and activities to be undertaken.

### **1.2.4 Stage 2 Appropriate Assessment**

Section 4 of this NIS report contains a summary of the findings of the AA screening assessment and more detailed examination and analysis of the implications of the Proposed Development on the Conservation Objectives of those European sites where the possibility of Likely Significant Effects (LSEs) could not be excluded at the screening stage in the absence of further evaluation and analysis, including mitigation measures.

## 2 METHODOLOGY

### 2.1 Published guidance on Appropriate Assessment

Appropriate Assessment Guidelines for Planning Authorities have been published by the Department of the Environment Heritage and Local Government ([DEHLG, 2010a](#)) and more recently by the Office of the Planning Regulator Practice Note (PN01) ([OPR, 2021](#)). In addition to the advice available from the Department, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of Appropriate Assessment, most notably including Notice C(2021) 6913 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC', which sets out the principles of how to approach decision making during the process. These principal national and European guidelines have been followed in the preparation this NIS report. The following list identifies these and other pertinent guidance documents:

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg (EC, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg (EC, 2007);
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. Office for Official Publications of the European Communities, Luxembourg (EC, 2009);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities, Dublin (DEHLG, 2010b);
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging. Office for Official Publications of the European Communities, Luxembourg (EC, 2011a);
- European Commission Staff Working Document 'Integrating biodiversity and nature protection into port development', Office for Official Publications of the European Communities, Luxembourg (EC, 2011b);
- European Commission Note on Setting Conservation Objectives for Natura 2000 Sites, Office for Official Publications of the European Communities, Luxembourg (EC, 2012);
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012);
- Interpretation Manual of European Union Habitats. Version EUR 28. Office for Official Publications of the European Communities, Luxembourg (EC, 2013a);
- Guidelines on Climate Change and Natura 2000. Office for Official Publications of the European Communities, Luxembourg (EC, 2013b);
- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects. Department of Communications, Climate Action and Environment, Dublin (DCCA, 2017);

- European Commission Notice C(2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2019);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.1)', London (IAQM, 2020);
- European Commission Notice C(2020) 7730 'Guidance document on wind energy developments and EU nature legislation', Office for Official Publications of the European Communities, Luxembourg (EC, 2020);
- Office of the Planning Regulator Practice Note (PN01) 'Appropriate Assessment Screening for Development Management', Dublin (OPR, 2021);
- European Commission Notice C(2021) 6913 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2021); and
- European Commission Guidance document on Assessment of plans and projects in relation to Natura 2000 sites - A summary, Office for Official Publications of the European Communities, Luxembourg (EC, 2022).

## 2.2 Likely Significant Effect

The Commission's 2018 Notice (EC, 2019) advises that the appropriate assessment procedure under Article 6(3) is triggered not by the certainty but by the likelihood of significant effects, arising from plans or projects regardless of their location inside or outside a protected site. Such likelihood exists if significant effects on the site cannot be excluded. The significance of effects should be determined in relation to the specific features and environmental conditions of the site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

The threshold for a Likely Significant Effect ("LSE") is treated in the screening exercise as being above a *de minimis* level. A *de minimis* effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present on a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be LSEs.

The analysis involved in a Stage 1 screening appraisal for Appropriate Assessment is described in EC (2021) as comprising four steps:

- ascertaining whether the plan or project is directly connected with or necessary to the management of a Natura 2000 site;
- identifying the relevant elements of the plan or project and their likely impacts;
- identifying which (if any) Natura 2000 sites may be affected, considering the potential effects of the plan or project alone or in combination with other plans or projects;
- assessing whether likely significant effects on the Natura 2000 site can be ruled out, in view of the site's conservation objectives.

Case law of the Court of Justice of the European Union (CJEU) has confirmed that a significant effect is triggered when:

- there is a probability or a risk of a plan or project having a significant effect on a European site;
- the plan is likely to undermine the site's conservation objectives; and
- a significant effect cannot be excluded on the basis of objective information.

EC (2021) defines a LSE as being "any effect that may reasonably be predicted as a consequence of a plan or project that would negatively and significantly affect the conservation objectives established for

the habitats and species significantly present on the Natura 2000 site. This can result from either on-site or off-site activities, or through combinations with other plans or projects”.

The requirement that the effect in question be ‘significant’ exists in order to lay down a *de minimis* or negligible threshold – thus, plans or projects that have no appreciable or imperceptible effects on the site are thereby excluded.

## 2.3 Mitigation Measures

In determining whether or not likely significant effects will occur or can be excluded in the Stage 1 appraisal, measures intended to avoid or reduce the harmful effects of the Proposed Development on European sites, (i.e. “mitigation measures”) or best practice measures have not been taken into account in this screening stage appraisal. This approach is consistent with up-to-date EU guidance (EU,2019; EC,2021; EC, 2022) and the case law of the Court of Justice of the European Union (CJEU).

EC (2001) states that “project and plan proponents are often encouraged to design mitigation measures into their proposals at the outset. However, it is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site”. This direction in the European Commission’s guidance document is unambiguous in that it does not permit the inclusion of mitigation at screening stage.

In April 2018, the Court of Justice of the European Union issued a ruling in case C-323/17 *People Over Wind & Peter Sweetman v Coillte Teoranta* (“People Over Wind”) that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

The judgment in *People Over Wind* is reaffirmed in up-to-date EC guidance documents which refers to CJEU Case C-323/17.

## 2.4 Consideration of *ex-situ* effects

EC (2019) advises that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites, but which are likely to have significant effects on any of them.

The CJEU developed this point when it issued a ruling in case C-461/17 (“*Brian Holohan and Others v An Coimisiún Pleanála*”) that determined *inter alia* that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an appropriate assessment must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.

In that regard, consideration has been given in this Habitats Directive appraisal to implications for habitats and species located both inside and outside of the European sites considered in the screening appraisal with reference to those sites’ Conservation Objectives where effects upon those habitats and/or species are liable to affect the conservation objectives of the sites concerned.

## 2.5 Conservation Objectives

The conservation objectives for each European site are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the site has been selected. The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;

- 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 (or condition, at a site level) 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;
- 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.

EC (2022) advises that an assessment should be done for all of the designating features (species, habitat types) that are significantly present on the site (habitats and species with A, B or C, but not D, site assessment in the Standard Data Form for the site) in view of their conservation objectives. EC (2022) additionally notes that *“the lack of site-specific conservation objectives or the establishment of conservation objectives, which are not in line with the required standard, as specified in the Commission note on “Setting conservation objectives of Natura 2000 sites” (EC, 2012), jeopardises compliance with the requirements of Article 6(3)”*.

### 2.5.1 Site-Specific Conservation Objectives

NPWS began preparing detailed Site-Specific Conservation Objectives (SSCOs) for European sites in 2011. The European sites within closest proximity to the Proposed Development which are considered in some detail in this NIS report have all had SSCO set. The published SSCO documents are as described in Section 4.1 of this document.

The published SSCO documents note that an appropriate assessment based on the most up to date conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.

The most up-to-date Conservation Objectives for the European sites being considered, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites is based on publicly available data on these European Sites, sourced from the [NPWS website](#) in September 2023.

### 2.5.2 In-combination Effects

Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are also considered. As set out in the Commission’s 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, cumulative effects and the vulnerability of the habitats and species concerned. Whilst the Directive does not explicitly define which other plans and projects are within the scope of the in-combination provision of Article 6(3), it is important to note that the underlying intention of this provision is to take account of cumulative impacts, and these will often only occur over time.

In that context, one can consider plans or projects which are completed, approved but uncompleted, or proposed. EC (2019) specifically advises [on p43] that *“as regards other proposed plans or projects, on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced”*.

## 3 THE PROPOSED DEVELOPMENT

### 3.1 Location of Project and Site Characteristics

The Proposed Development is located at the Burrow which is a sandy spit that separates the outer Rogerstown Estuary from the Irish Sea as illustrated in Figure 3.1. The Burrow is fronted by a wide sandy beach as illustrated in Figure 3.2 and Figure 3.3 and is bordered by rocky headlands at Rush towards the north and Portrane to the south.

The nature of the spit and beach is strongly influenced by the tidal action of the estuary and waves approaching the shoreline from the Irish Sea. Lambay Island, which lies around 5km east of the beach, also influences both the wave and tidal conditions.

A considerable amount of unplanned development has occurred over the years. This is recognised in the Fingal County Development Plan 2017-2023, where the gradual removal of temporary homes is encouraged, whilst the replacement of temporary homes with permanent dwellings is discouraged.

For more than a decade, the Burrow has been adversely affected by episodes of acute coastal erosion which were in turn driven by extreme storm events. In 2018 Storm Emma and a succession of other events resulted in the shoreline retreating by more than 20m along some sections of the Burrow. The coastal retreat during this episode was so severe that a private residential property had to be abandoned and demolished some months later.

Before the installation of interim coastal protection works in 2018, which were designed to slow the rate of erosion until a more sustainable long-term protection solution could be developed, the rate of erosion along the Burrow coastline typically ranged between 2 – 3m per year. The interim coastal protection works, i.e. the concrete Seabee units which are shown in Figure 3.3 have effectively reduced erosion rates since they were installed. However much of the coastline remains vulnerable to erosion, particularly during periods of high tides or surge activity when waves can propagate over the units and freely attack the coastline. The interim protection works therefore cannot achieve the aims of the proposed development in providing long-term protection to the Burrow in storm events.



Figure 3.1: Location of the project site at the Burrow, Fingal, County Dublin



Figure 3.2: Southerly aerial view of the beach at the Burrow (2019)



Figure 3.3: Northerly aerial view of the beach at the Burrow (2019)

## 3.2 Proposed Development

In February 2018 RPS were commissioned by FCC to assess the feasibility of a sustainable coastal flood protection scheme to reduce the flood risk that exists across the Burrow. Following Storm Emma and several other arduous storm events that occurred in the winter of 2017/2018, the position of the shoreline at Burrow retreated by more than 20m in some areas. Consequently, the scope of the RPS commission was extended to include for the development of interim emergency coastal protection works (Seabees) and a longer-term erosion management solution. The interim measures were installed until such time that the longer-term solution, as identified in the Coastal Flooding and Erosion Risk Management (CFERM) study could be implemented.

The Proposed Development builds on the preferred option as identified in the CFERM study (RPS, 2020). It should be noted that this study also identified a preferred scheme for Rush South which is located on the northern side of the Rogerstown estuary. However, this scheme is being considered independently given that the Proposed Development for the Burrow and the preferred scheme at Rush do not rely upon one another, with each addressing specific risks (i.e. erosion and flooding at the Burrow and only flooding at Rush South).

The Proposed Development for the Burrow is split into three areas, the northern extent of the spit at the end of Burrow Road, at Marsh Lane, and along Portrane beach. The Proposed Development consists of the following main elements:

- Construction of a c.190m long earth embankment at the end of Burrow Road,
- Construction of a c.130m long sheet piled flood wall and a c. 200m embankment along Marsh Lane,
- Installation of back drainage behind the proposed defences with associated outfalls,
- Installation of non-return valves to existing outfalls to prevent backflow of water from the estuary,
- The construction of seven fishtail (or 'Y' shaped) groyne structures in combination with a beach renourishment scheme at Portrane beach. These groyne structures will help control the longshore and cross-shore transport elements of the prevailing littoral drift along c.1.3km of the coastline of the Burrow.
  - Each groyne will extend seaward by approximately 70m at a spacing of c.175m to create seven sediment sub-cells along the Burrow. The total footprint of the proposed groynes will equate to c.1.36ha;
  - The beach renourishment will involve transporting dredged material from a licenced marine aggregate extraction site (presently assumed to be Liverpool Bay) to the Burrow and pumping the material ashore to fill each of the seven sediment sub-cells created by the fishtail groyne structures.

The location and extent of the Proposed Development are illustrated in Figure 3.4, overleaf.

The primary objectives of the Proposed Development are to:

- Provide effective coastal flood protection during a 0.5% Annual Exceedance Probability (AEP) event based on the Medium Range Future Scenario (MRFS) whereby sea levels are expected to rise by +0.50m by 2100,
- Mitigate the ongoing coastal retreat along the beach frontage,
- Restore and enhance the recreational value of the natural beach amenity which has significantly deteriorated over recent years due to an overall loss of sand material from the beach,
- Enhance and protect some of the qualifying interests of the nearby environmentally designated sites which have been deteriorated by chronic and acute erosion over recent years.

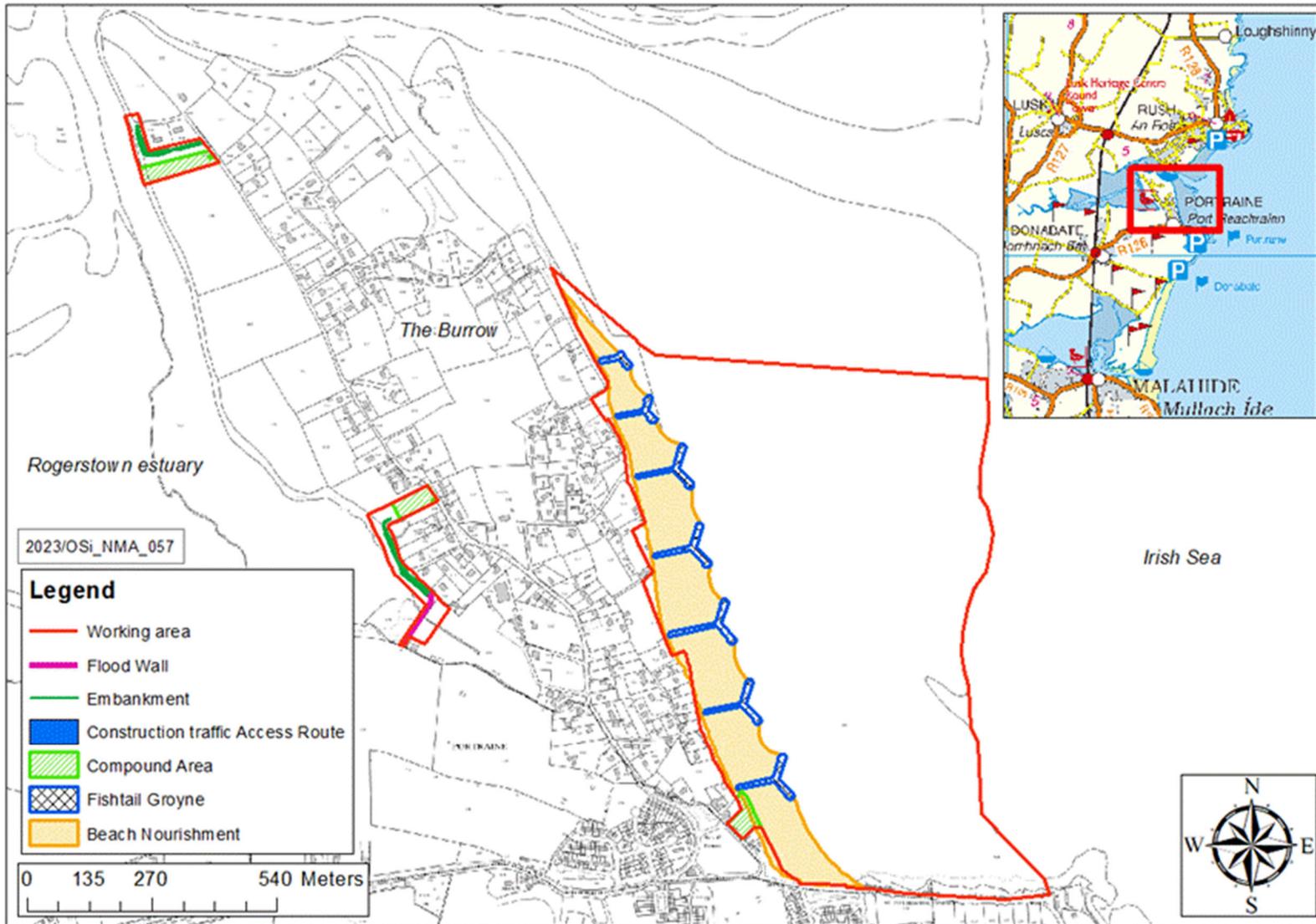


Figure 3.4 Overview of the Proposed Development at the Burrow, including Site Boundary and Working Areas

### 3.2.1 Flood Embankments at Burrow Road & Marsh Lane

The function of the flood embankment structures at Burrow Road and Marsh Lane is to prevent coastal flooding caused by tidal inundation. An overview of the design details for these structures is listed below:

- The embankments will be constructed with 1 in 2.5 side slopes on both sides.
- The embankments will be constructed with a 1m wide centre to allow for easy and safe access to inspect and maintain the embankment.
- The core will be comprised of suitable clay material which will be compacted within a trench to the sub-formation level.
- The embankments will be built up to the design crest level of 4.02mOD using compacted layers of suitable granular fill to SHW Series 600.
- The embankments will be covered by topsoil and seeded to promote the growth of vegetation.

A summary of the key metrics associated with the flood embankments is presented in Table 3-1, below.

**Table 3-1 Summary of the extent, footprint and construction volumes for the flood embankments at Burrow Road and Marsh Lane**

Metric	Marsh Lane Embankment	Burrow Road Embankment	Total
Length [m]	200	190	390 m
Footprint [m <sup>2</sup> ]	1,580	1,304	2,884 m <sup>2</sup>
Volume of existing material to excavate [m <sup>3</sup> ]	776	856	1,632 m <sup>3</sup>
Volume of clay material to import [m <sup>3</sup> ]	198	190	388 m <sup>3</sup>
Volume of granular fill to import [m <sup>3</sup> ]	1,250	567	1,817 m <sup>3</sup>

### 3.2.2 Flood Wall at Marsh Lane

The function of the flood wall structure at Marsh Lane is to tie into the proposed flood embankment (see previous section) and prevent coastal flooding caused by tidal inundation along a section of coastline where there is insufficient space to construct an embankment. An overview of the design details for this structure is listed below:

- The c.130m flood wall will consist of sheet piling to the defined defence level of 3.82mOD with a concrete strip foundation to support the cladding on both sides.
- The sheet piling will be completed with coping detail along the crest.
- Based upon preliminary ground investigation work, the toe depth is likely to be in the region of -10mOD. This should be confirmed at the detailed design phase.
- Facing panels or cladding can be implemented if required to give the appearance of a concrete or masonry wall.
- Back drainage will be installed at the dry side of the piled flood wall.

### 3.2.3 Fishtail groyne structures

To limit the loss of beach renourishment material along Portrane beach and to provide wave protection to the coast, the Proposed Development includes the construction of seven fishtail groyne structures along c. 1.3km of the beachfront. An overview of the design details for these structures is listed below:

- Each groyne structure will extend seaward for approximately 70m, before splitting into a “fishtail” or a “Y-shape”. Each groyne will then extend seaward for an additional c.40m at a 120° angle.
- The core of the c. 70m trunk of each groyne will be constructed by re-using the existing Seabee units which are already on the beach.
- The landward edge of each groyne structure will be constructed 10m seaward of the coastline to facilitate pedestrian access along the upper foreshore.
- The Seabee units will be placed on a bedding layer and a 0.3 – 1.0 T underlayer, separated from the beach using a heavy-duty geotextile.
- A single layer of 0.3 – 1.0 T rock armour will be placed over the Seabee units at a slope of 1:1.5.
- The fishtail structures will be constructed exclusively of rock fill and rock armour (i.e., no Seabee units).
- The filter layer of each fishtail structure will be placed onto and wrapped in a heavy-duty geotextile.
- The crest level of each groyne structure will be constructed to c.4.25mOD at the shoreline and slope to c.2.85mOD at the seaward side of the fishtails.
- The fishtails will be constructed with a consistent crest level of c.2.85mOD.

The total footprint of the seven groyne structures equates to c.13,615m<sup>2</sup>, whilst approximately 42,000 T of rock armour/core material will be required to construct the seven groynes (subject to detailed design).

### **3.2.4 Beach renourishment**

Upon completion of the groyne structures, the sub-cell areas will be filled with beach renourishment material imported from a licenced marine aggregate extraction site (presently assumed to be Liverpool Bay). Based on present-day beach levels, it is envisaged that c.425,000m<sup>3</sup> of material will be required to achieve the proposed beach levels of c. 3.0mOD.

The nourished beach profile within each groyne sub-cell has been designed to provide a c.25m flat upper foreshore at c. 3.0mOD before sloping down to meet existing beach levels.

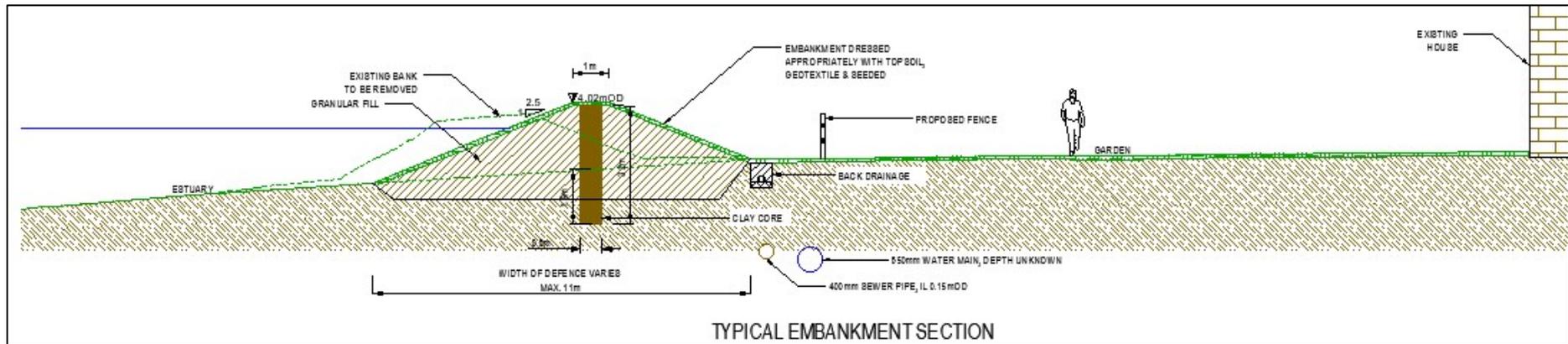


Figure 3.5: Cross-section of a typical embankment at Marsh Lane and Burrow Road

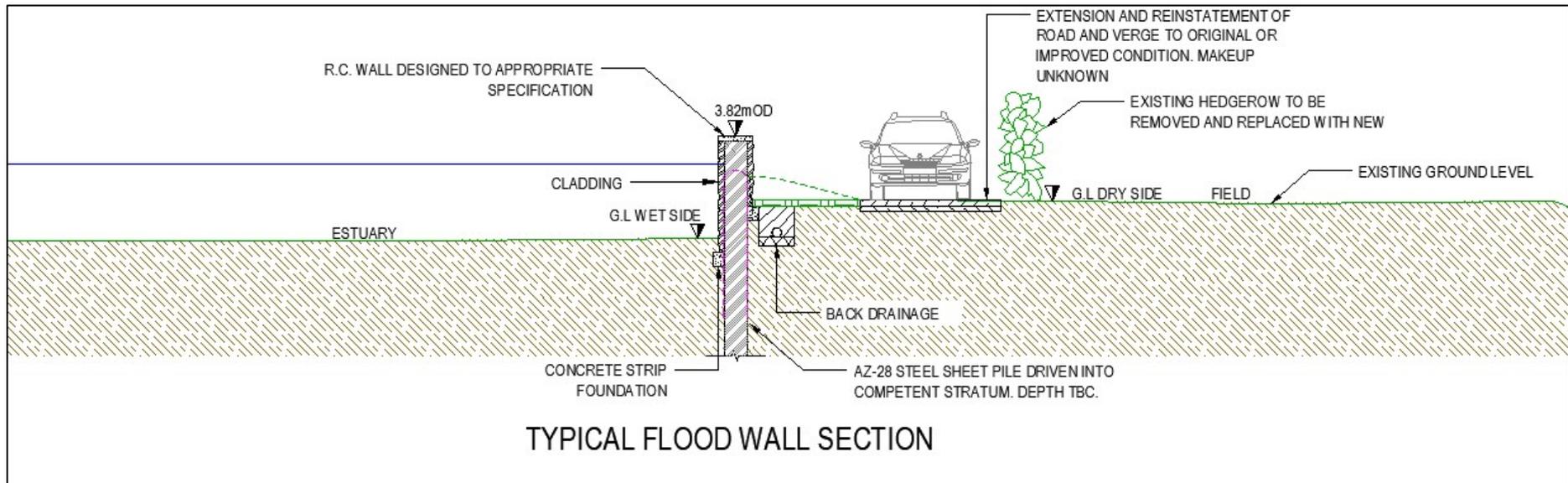


Figure 3.6: Cross section of a typical flood wall at Marsh Lane

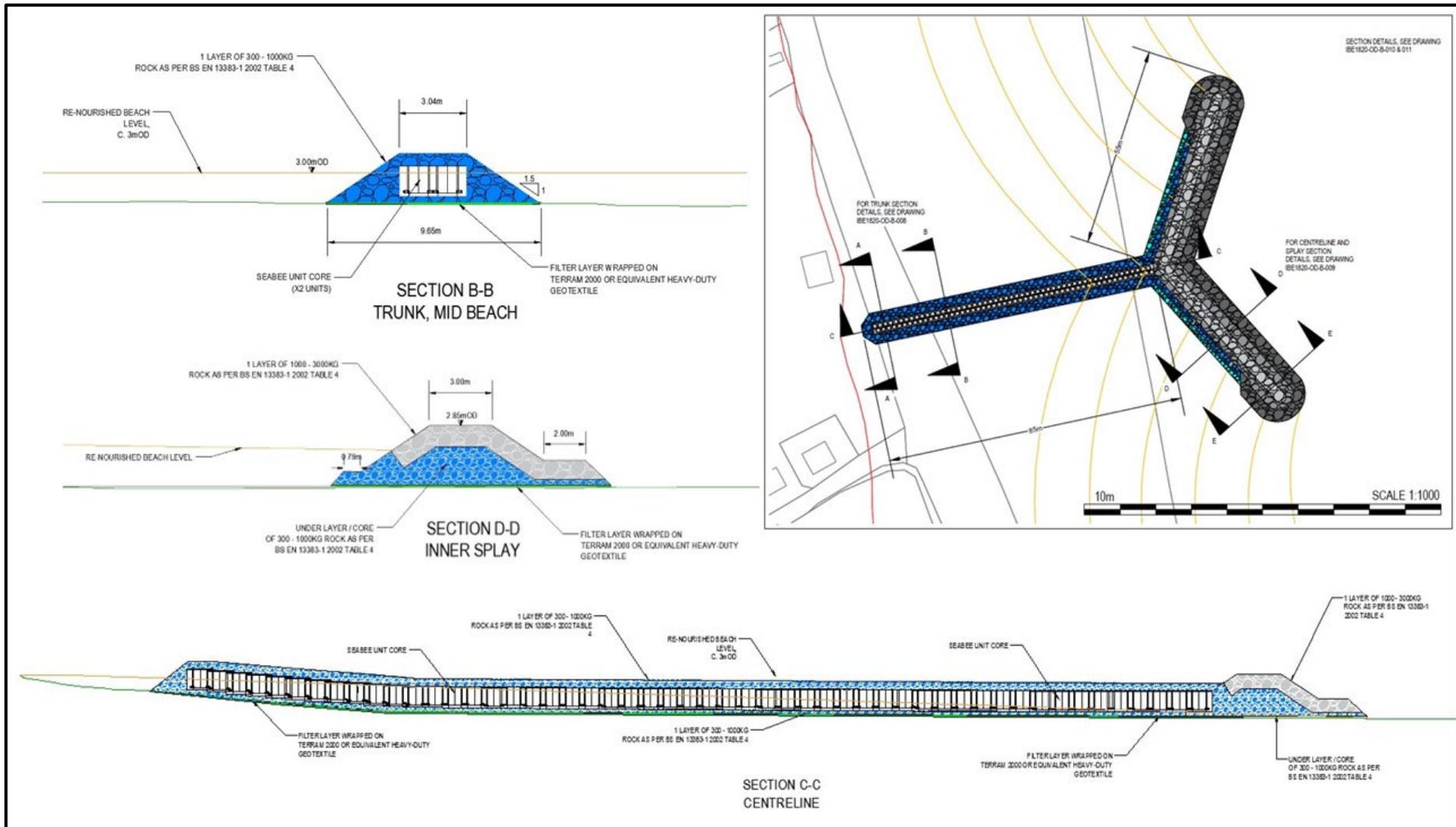


Figure 3.7: Cross section of a typical fishtail groyne structure and beach renourishment level

## 3.3 Outline Construction Method Statement

The various defence elements of the Proposed Development will likely be delivered over several phases. Key phases are likely to include advance works, construction, operations and future maintenance as outlined below in the following Sections.

### 3.3.1 Advance Works

Advanced works are likely to include, but not be limited to the following:

- Landowner and community liaison, particularly due to the requirement of temporary occupation of gardens at Burrow Road, and the use of roads for access. The progress of the works and working methods should be communicated to residents to avoid complaints, particularly activities such as vibratory pilling or compaction.
- Diversion of utilities where required, including a water main and combined sewer, a CCTV camera, and overhead ESB cables.
- Preparation of site compounds – likely on existing made ground in various locations owing to the number of areas requiring coastal defence works. Where possible, storage of materials shall be outside of the SAC and SPA boundaries. Fuel and plant would be stored as per the requirements of the CEMP.
- Fencing of live working areas and site compounds to prevent public access and vandalism.
- Traffic management measures on live roads as necessary.
- Pedestrian traffic management measures/closing off of the area along the beach as necessary.

### 3.3.2 Construction of Flood Embankments

The outline method of construction for the flood embankments of Marsh Lane and Burrow Road is likely to be:

- Install temporary works as required to provide a dry working area,
- Strip and store topsoil for reuse, including removal of any soft spots (depending on the subgrade layer, a separator may have to be placed),
- Remove existing bunds or localised elevated ground features (particularly the existing bluff at Burrow Road),
- Provide temporary haul road as required for access,
- Import and store suitable clay core material by lorry and road. This will be stored within the designated compound areas and brought to required locations using an excavator and dumper,
- Excavate the core trench, place, and compact clay in layers to the sub-formation level,
- Excavate to and grade sub-formation level beyond the footprint, with horizontal benching on relatively flat ground or if necessary, stepping of the profile to resist sliding if the existing ground profile slope is greater than 1 in 5,
- Build-up embankment to crest level in compacted layers using appropriate granular fill to SHW Series 600,
- Trim and profile the shoulders of the slopes to meet the required gradient of 1 to 2.5,
- Place topsoil, sow with grass seed and place a suitable, biodegradable geotextile. The geotextile will protect the embankment from erosion until the establishment of vegetation,
- Excavate and install back drainage at the rear toe of the embankment (see Section 3.3.4),

- Install stock proof fencing as the embankments are to be located or partially located in agricultural land where grazing is likely; to prevent damage to the defences,
- Remove the haul road and reinstate the working area.

### 3.3.3 Construction of the Flood Wall

The outline method of construction for the flood wall at Marsh Lane is likely to be:

- Delivery of piles to the site by articulated lorry or similar along the access route and storage in the appropriate areas. Piles will need to be stored in the working area before installation.
- Removal of the existing hedgerow between the lane and agricultural field, and establishment of a working area which will facilitate access for dumpers, excavators, concrete lorries and piling rigs. A stoned access route will be established within this area to provide a separate means of access for the residents along Marsh Lane and at the end of Marsh Lane.
- Install temporary works as required on the landside to maintain a minimum flood protection standard during the construction period.
- Establish a stable working platform from which the piling rig can operate. This will partially occupy Marsh Lane itself, in which space is very limited.
- Demolish and remove the existing wall on Marsh Lane, which is in poor condition and is likely to be damaged by vibration impacts.
- Set out the clutch line of piles.
- A crane will hoist piles vertically to be gripped and aligned by the piling rig before being driven to the required depth, and finish at the design top of wall level. A vibratory piling technique will be employed to reduce noise and vibration impacts, as opposed to percussive methods.
- Construct the concrete capping beam to the top of the piles, involving shuttering, steel fixing and concrete pour.
- Install facing panels or cladding if required to give the appearance of a concrete or masonry wall.
- Excavation and installation of back drainage at the dry side of the piled flood wall.
- Removal and reinstatement of the temporary haul road and working area.

To avoid potential impacts to the nearby Atlantic Salt Meadow habitat in this area, construction plant will not be permitted access to the foreshore with all works instead being undertaken from landside. If necessary, access for labourers to the seaward site of the seawall can be temporarily facilitated by laying bog mats, or similar provisions, at the toe of wall. Bog mats should be lifted and laid with every tidal cycle as necessary.

Other considerations including cladding finish to the wall and coping stone details, connection details between the wall and embankment, and outfall details for the existing culvert under the road will be specified at the detailed design phase.

### 3.3.4 Implementing Back Drainage for Flood Defences

Each of the new flood defences will have some degree of cut-off to prevent excessive flow beneath the defences. Along with the above-ground barrier, this adversely restricts the ability of the land behind the defences to drain post-scheme construction.

To facilitate drainage and ensure the land behind the defences does not become waterlogged, it will be necessary to construct a series of land drains behind the defences. These will consist of perforated pipes bedded in No Fines granular material and laid parallel to the defence line at the rear toe. Precast concrete manholes or plastic inspection chambers will be provided at regular intervals to facilitate access for maintenance or changes in direction. At suitable locations, the outfalls of the back drain will discharge

to the estuary. The outlet pipework will therefore have to pass either beneath embankments or through walls as applicable, with non-return valves installed to prevent backflow.

In the case of the embankments, the outlet pipework will be laid during embankment construction and will have a "collar" which will key into the clay core and prevent a flow path from forming along the line of the drainage pipe. Careful compaction of clay/ shoulder material will also be required to minimise this risk.

In the case of piled walls, outlet pipework will be cored through at suitable locations once they have been installed.

### 3.3.5 Construction of Fishtail Groyne Structures

The construction methodology of each fishtail groyne structure will involve the following:

- All rock armour material which is currently estimated at c. 42,000T (subject to detailed design) will be transported from a quarry (currently anticipated to be at Arklow) using Large Good Vehicles (LGVs) in 20T loads. Upon arrival at the site, material will be offloaded and stored within the adjacent compound facility.
- Material will then be transported from the compound material and placed onto the beach by a suitable-sized excavator / offroad dump truck,
- An excavator/offroad dump truck will be used to place a c. 200mm filter layer and 0.30 – 1.0T rock armour underlayer onto heavy-duty geotextile across the footprint of the groyne trunk, starting landward and working seawards,
- Concrete Seabee units which are already on the beach will be lifted and re-positioned along the groyne trunk in an interlocking fashion using an excavator,
- A single layer of 0.3 – 1.0T rock armour will be placed over the Seabee units at a slope of 1:1.5 using a suitable-sized excavator / offroad dump truck,
- The fishtail sections of the groyne will be constructed in a similar fashion, placing a single layer of primary 1 – 3T rock armour over the bedding and 0.3 – 1.0T underlayer and core layers to achieve the design crest level and elevations using a suitable sized excavator / offroad dump trucks.

The duration of works will be highly dependent on yield production rates at the elected quarry, but assuming material can be stockpiled on site, it is envisaged that each groyne will take c. three weeks to construct (subject to tide and weather conditions).

It is therefore expected to take c.28 working weeks to complete the construction of all seven fishtail groyne structures subject to tidal restrictions and assuming that works can be undertaken outside of normal working hours when required. However, as noted in section 3.5.7 it is envisaged that this work will be undertaken by two squads in a c. 17 week period in order to comply with relevant environmental constraints.

Subject to quarry production rates, it is expected that rock armour will be delivered to the site at an approximate rate of three trucks per hour throughout an anticipated eight-hour working day. This equates to c. 90 days of rock armour related deliveries based on a six-day working week.

### 3.3.6 Beach renourishment campaign

Upon completion of the groyne structures, the sub-cell areas will be filled with imported beach renourishment material. The construction methodology for this element is outlined below.

- Supporting equipment required for the beach renourishment elements including flanged shore pipeline sections, dry plant and ancillary kit will be transported to the site by road, using approved routes and offloaded within a compound or a secure area at the beach,
- The sinker pipeline will be brought in 12m lengths to a suitable location using road transport, where it will be welded into the required length before being floated and laid on the seabed,

- A mooring point, acting as the connection between the dredger and sinker pipeline will be located on the seabed in a water depth of approximately 10m CD, allowing for the safe mooring of the dredger over all states of the tide, and will consist of a length of floating pipeline connected to the steel 'sinker' pipe positioned on the seabed,
- The sinker pipeline will be connected to the steel shore pipeline on the beach, with additional 12m lengths of pipeline added as the nourishment progresses and the design profile is achieved,
- It is envisaged that a maximum frontage of 650m can be completed before the sinker pipe has to be relocated to a second position to complete the works. This equates to two individual operations to place/ move the sinker pipe,
- Upon setup of ancillary equipment as described above, a fully laden trailer suction hopper dredger (TSHD) will sail to Portrane Beach from the licensed nourishment extraction area (presently assumed to be Liverpool Bay). The licensed nourishment extraction area, whether Liverpool Bay or otherwise, will have been subject to the relevant consenting mechanisms and associated environmental assessment.
- Upon arrival, the TSHD will couple to the connection point, fluidise the material within the hopper and pump it to shore,
- Once on the beach, the material will be profiled using GPS-equipped dry plant (dozers), with the shore pipeline extended as each section of the beach is completed. Once discharged the dredger will uncouple and return to the licenced marine excavation area to dredge the next load,
- It is envisaged that the TSHD will operate "non-tidally", i.e., working in the most efficient manner to reduce losses. This will introduce a requirement for 24 hr working on the beach during unloading operations.

Based on a delivery rate of 95,000m<sup>3</sup> per week, it is envisaged that all c.425,000m<sup>3</sup> of material could be transported to Portrane Beach within c. 6 weeks (accounting for losses during the discharge and measurement processes).

## 3.4 Construction Management and Constraints

### 3.4.1 Site Compound and Working Areas

To facilitate the storage of materials and accommodate welfare facilities and site offices it will be necessary to provide sufficient site compounds and working areas within the proximity of the proposed construction works. These would preferably be located adjacent to the main work areas and must be secured adequately. Temporary works will also be required in some areas to prevent the tide from infiltrating the works zone each day during construction.

At Burrow Road, RPS propose the area of land directly south of the proposed embankment location for a site compound. At the Marsh Lane site, the proposed compound area is to the north of the defence with access directly off Burrow Road. These site compound areas and access routes are illustrated in Figure 3.4.

Adequate working room is required to ensure that the Proposed Scheme can be built safely with full consideration of the movement of plant, transportation, and storage of materials.

At Burrow Road, working room at the site is restricted on the dry side of the defence due to the private lands of the residents, with a strip of approx. 4m width alongside the proposed embankment toe. On the seaward side, an offset of 15m from the proposed embankment toe into the estuary has been proposed to minimise encroachment onto the foreshore. Whilst some working within the estuary cannot be avoided, no construction plant will be permitted direct access to the foreshore area. Access for labourers to foreshore can be temporarily facilitated by laying bog mats, or similar provisions. Bog mats should be lifted and laid with every tidal cycle as necessary.

At Marsh Lane, the working area is restricted to the dry side of the proposed defences, in order to limit land take and minimise long-term impacts to the protected salt meadow habitat in the estuary. Whilst some working within the estuary cannot be avoided, no construction plant will be permitted access to the foreshore area seaward of the defence line. Access for labourers to the seaward site of the seawall can be temporarily facilitated by laying bog mats, or similar provisions, at the toe of wall. Bog mats should be lifted and laid with every tidal cycle as necessary.

For the construction of the coastal elements (i.e. groyne structures and beach renourishment), the proposed compound area is within a recreational green space located directly adjacent to Pipers Takeaway. This site has previously been used as a compound and storage area during the construction of the temporary erosion measures that are currently in place on the beach.

As the working areas are greenfield or estuarine in nature, stripping of topsoil or sand deposits and stoning is required as necessary to provide a temporary haul road to facilitate plant movement. Heras fencing panels, or similar, will need to be erected as a site security measure for the duration of the works in terrestrial areas. Upon completion of the works, site compounds and temporary working areas will be re-topsoiled and/or reinstated to the existing condition.

### **3.4.2 Access Routes for Construction**

All terrestrial plant and materials will be brought to Burrow Road via the R126. This will require plant movements on public roads for the duration of the works and therefore consideration must be given to this in the Contractor's traffic management plan. With appropriate controls and good contractor working practices, this can be achieved without significant risk, but it must be thoroughly considered in terms of construction methodology, timeframes, and cost.

### **3.4.3 Management of Materials and Plant**

Within the confines of the working areas, plant movements will be linear in nature. Materials including clay, sheet piles, reinforcement steel, concrete, shuttering, pipework, and topsoil will require transportation up and down these areas from the construction access points, depending on the location of the defence. This may require stoning of these areas to provide adequate haul roads during all weather conditions.

Due to working within the estuary boundary and proximity to properties, it will be necessary to ensure all machinery is in good condition and well maintained to minimise oil leaks and noise to the adjacent properties as far as possible.

There is one location proposed for the storage of materials at each site. These are the site compound areas as illustrated in Figure 3.1. It is envisaged that these will be used for storage of materials that may include topsoil, clay, reinforcement steel, drainage pipes and sheet piles until needed for construction. From there, materials will be transported to the relevant section of defence utilising a range of plant via the constructed haul roads.

In addition to these designated storage areas, it may be necessary to store materials within the working area immediately before using them for construction. The Contractor may also wish to store stripped topsoil in these locations which would reduce the number of site movements associated with double-handling topsoil. However, these activities will be limited as far as reasonably practicable in working areas that lie within the Rogerstown Estuary SAC and SPA boundary, both at Burrow Road and Marsh Lane, furthermore no material storage will take place within vulnerable Annex I habitat associated with the SAC.

### **3.4.4 Working Within the Estuary**

Works within Rogerstown Estuary are unavoidable. Temporary works will be required to prevent coastal waters from interacting with works activities throughout the duration of the scheme. The design of temporary work to ensure the method of temporary flood protection is stable and avoids seepage will be the responsibility of the appointed Contractor.

### 3.4.5 Long-Term Operations and Maintenance

Given that the flood elements of the Proposed Scheme are hard defences there are no unusual or specialist maintenance or operational activities envisaged. A description of envisaged maintenance activities for the flood elements of the Scheme is detailed below.

- **Walls** – maintenance associated with these will be minimal. Inspections in accordance with standard asset management procedures are likely to be the main activities. Dealing with vandalism in terms of graffiti or damage to coping stones (if provided) can be an issue.
- **Embankments** – these will need regular inspection and should be mowed at least twice annually to prevent the growth of significant vegetation. Inspection activities will need to look for the presence of animal burrowing or damage from livestock although fencing of the defences, where located within agricultural fields should prevent the latter. Access to embankments is easily achieved for both inspection and maintenance purposes.
- **Drainage elements** – non-return valves will need to be checked regularly to ensure they are working as they form a key aspect of the Scheme function. These will be designed in such a way as to provide safe access. This can be within a manhole on the defended side of the defences rather than at the point of the outfall to the river. Back drainage will need to be checked for blockage and rodded if necessary. Manholes/ inspection chambers will be provided to enable this to happen. These manholes will be located on private property including residential gardens and agricultural land.

As the beach renourishment element of the coastal scheme on the beach is predominantly a “soft” nature-based solution, sediment material will be gradually lost from between the groyne structures over time and particularly during storm conditions. As such, beach levels within these cells will gradually reduce over time and require periodic renourishment.

Whilst the frequency of renourishment will be subject to prevailing weather conditions due to the physical characteristics of the renourishment material and the detailed design of the groyne structures, it is expected that the beach will require renourishment approximately every 5-10 years. The magnitude of renourishment will be subject to the rate of losses during the intervening period but is expected to range between 50 – 75% of the initial nourishment volume.

## 3.5 Preliminary Construction Programme

As illustrated in Figure 3.8, the overall estimated programme is 23 weeks.

The programme considers the following elements:

- Traffic management,
- Utility diversions,
- Site establishment and clearance,
- Flood wall,
- Flood embankments,
- Back drainage,
- Seabee / rock armour groynes,
- Beach renourishment,
- Reinstatement.

The programming of these elements is described in the following sections. It should be noted that the predicted timescales are subject to change due to potential detailed design changes, liaison with key stakeholders and the resources assigned to the construction elements by the appointed contractor. As discussed above, detailed design changes are likely to be minimal and inclusive of the finalised selection

of the extraction area for beach renourishment material. While this is anticipated to be Liverpool Bay, licensed Aggregate Production Area 457, any extraction site will regardless have been subject to the relevant licensing process and associated assessment requirements including Habitats Regulations Assessment.

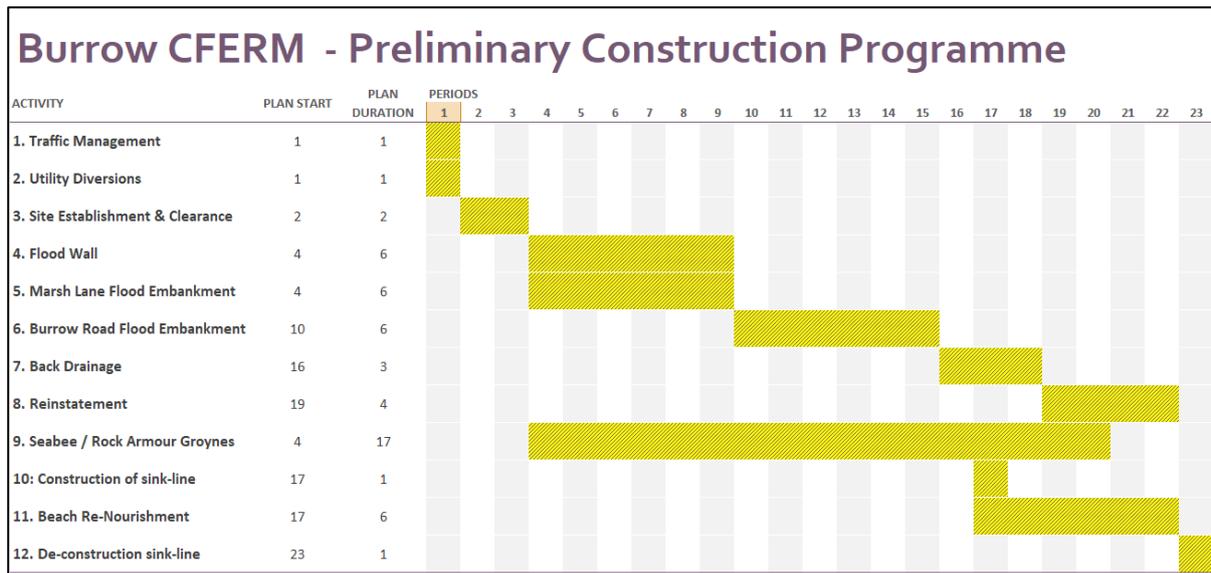


Figure 3.8 Preliminary construction programme for the Burrow CFERM scheme

### 3.5.1 Traffic Management

Given its proximity to the local road network, traffic management will be ongoing throughout the entirety of the Proposed Development. A period of one week has been programmed to allow for the setup of required measures, although this will ultimately depend on the Contractor’s agreed Construction Traffic Management Plan (CTMP) as well as the extent of utility diversions required.

### 3.5.2 Utility Diversions

The Burrow Outline Buildability Report describes potential utility clashes including the narrow access road at Marsh Lane which will increase the complexity of relocating electric poles and ultimately require the closure of this road. In addition, the water and sewer main that runs along and beneath the proposed embankment in the field at Burrow Road may need diverted as well as the overhead ESB pole at this location.

Taking account of this, a one week period is allotted in the programme for completing these advanced works, assuming such diversions are required. However, the exact number of utility diversions needed will be further determined at the detailed design phase.

### 3.5.3 Site Establishment and Clearance

Two weeks have been provisionally included to allow the Contractor to establish a site compound and working areas, complete site clearance, erect temporary works and carry out other relevant activities, as referenced in the Burrow Outline Buildability Report. This timeframe will likely be required due to the distance between the Burrow Road, Marsh Lane and Portrane Beach sites.

### 3.5.4 Flood Wall

The proposed flood wall at Marsh Lane involves the driving of approximately 186 piles for a 130m long wall. The progression of this critical item of work will be heavily influenced by local obstructions and general ground conditions across the site, which will not be fully uncovered until the works take place. Piles will be driven and clutched first, with other working squads anticipated to follow in sequence to

excavate and pour strip foundations, fabricate formwork, tie reinforcement steel, pour the concrete capping beam and apply the desired cladding or facing panel finishes to both sides of the wall, which totals approximately 16.25m<sup>3</sup> of concrete.

An existing channel emerging beneath the lane and existing wall will be replaced with a new culvert and must also be accommodated; the design of these items will be considered further in the detailed design however this assessment has assumed that these elements will form a part of the proposed development.

Based on a construction rate of c. 50 metres per week, with an allowance of one week for the culvert construction, a total period of four weeks has been programmed for the construction of the flood wall at Marsh Lane.

### **3.5.5 Flood Embankments**

The timeframe for the proposed 190m long embankment at Burrow Road and 200m long embankment at Marsh Lane will depend on local ground conditions. At Burrow Road, approximately 860m<sup>3</sup> of spoil must be cut and removed from the site, and roughly 277m<sup>3</sup> of fill must be imported. This and the general construction of the embankment at Burrow Road is initially programmed to take six weeks.

At Marsh Lane, although the length of the embankment is similar, and less spoil is estimated to require removal (approximately 794m<sup>3</sup>), a greater volume of fill totalling approximately 917m<sup>3</sup> must be imported for construction. However, the construction of the embankment and flood wall at this location can occur concurrently subject to resources assigned by the Contractor. Thus, it can be estimated that the Marsh Lane embankment will take the approximately six weeks to construct.

### **3.5.6 Back Drainage**

Back drainage will be required at the dry side along the entirety of the defences at Burrow Road and Marsh Lane. Given the fact that these drains will also require manholes at regular intervals, four weeks has been programmed for these works.

### **3.5.7 Seabee/ Rock Armour Groynes**

Based on liaison with experienced contractors, it is estimated that under normal circumstances approximately four weeks would be needed to construct each groyne structure. With a total of seven groynes, the total construction period for these elements would equate to c. twenty-eight weeks.

However, owing to the relevant environment constraints, it will be necessary for the appointed contractor to assign two squads to these works so that two groyne structures can be constructed concurrently. Based on this, it is anticipated that all groyne structures will be constructed within seventeen weeks. This includes for three additional weeks for potential delays caused by adverse weather or tidal conditions.

### **3.5.8 Beach Renourishment**

Having liaised with industry experts, it has been estimated that the beach renourishment works can be completed over the course of a six-week period. This is based on a dredge vessel discharging a 10,500m<sup>3</sup> load c. nine times per week. This estimation accounts for typical delays due to weather, bunkering, maintenance etc.

It should be noted that the beach renourishment works would commence concurrently with the construction of the last two groyne structures.

### **3.5.9 Reinstatement**

This item of work will involve the removal of surplus materials from site, removal of plant and site compounds, reinstatement of verges, road surfaces, the estuary bed, other working areas, and removal

of traffic management. Intricate reinstatement details will be developed in the detailed design stage, however provisionally a period of four weeks has been programmed for the reinstatement of the Burrow areas to their prior condition.

## 4 STAGE TWO APPRAISAL TO INFORM AN APPROPRIATE ASSESSMENT OF IMPLICATIONS ON EUROPEAN SITES

### 4.1 Conclusions of the SISAA Report

The Developer's Supporting Information for Screening for Appropriate Assessment (SISAA report, at Appendix A) was completed in compliance with EU and Irish law and the relevant European Commission and national guidelines to determine whether or not Likely Significant Effects on any European site could be excluded as a result of the Proposed Development.

The Proposed Development is stated in the SISAA report as being not directly connected with or necessary to the management of any European site although it will provide enhanced protection to designated features currently being lost to erosion.

The possibility of significant effects was considered using a source-pathway-receptor model, where 'Source' was defined as the individual elements of the proposed works that have the potential to affect the identified ecological receptors both within the European site and outside of it in accordance with the 'Holohan' judgment (refer Section 2.4 above). 'Pathway' was defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' was defined as the Special Conservation Interests (for SPAs) or Qualifying Interests (of SACs) for which conservation objectives have been set for the European sites under consideration. Each element can exist independently however an effect is created when there is a linkage between the source, pathway and receptor.

Possible direct and indirect effects arising as a result of activities undertaken as part of the Proposed Development were discussed under the following themes:

- Direct Effects
  - Habitat loss and alteration ("Habitat Loss")
- Indirect Effects
  - Water quality and habitat deterioration ("Water Quality")
  - Altered coastal processes
  - Spread of invasive species
  - Underwater noise and acoustic disturbance or displacement ("Underwater Disturbance")
  - Aerial noise and visual disturbance or displacement ("Aerial Disturbance")
  - Loss of functionally linked habitat outside the European site boundaries ("Ex-situ Habitat Loss")

Having regard to the methodology employed and the findings of the appraisal and having applied the precautionary principle it was concluded that a Natura Impact Statement was required, to assess the implications of the Proposed Development, in relation to their potential to give rise to likely significant effects on the conservation objectives of a number of European sites as outlined below, either alone or in combination with other projects:

- **Habitat Loss** of Annex 1 habitats of Rogerstown Estuary SAC and wetland habitats of the Rogerstown Estuary SPA;
- **Water quality effects** on Annex 1 habitats of Rogerstown Estuary SAC, wetland habitats and SCI bird populations of the Rogerstown Estuary SPA, SCI bird populations of the North-west Irish Sea cSPA, Annex II QI species of the Rockabill to Dalkey Island SAC, Lambay Island SAC and SCI bird populations of the Rockabill SPA;

- **Spread of invasive species** on Annex I habitats of Rogerstown Estuary SAC and wetland habitat of the Rogerstown Estuary SPA.
- **Underwater noise and vibrational disturbance** of Annex II QI species of the Rockabill to Dalkey Island SAC and Lambay Island SAC;
- **Aerial noise and visual disturbance** of SCI bird populations of Rogerstown Estuary SPA, North-west Irish Sea cSPA, Lambay Island SPA and Rockabill SPA and Annex II QI species of Lambay Island SAC; and
- **Ex-situ habitat loss** of functionally linked habitat for SCI bird populations of Rogerstown Estuary SPA and Annex II QI species of Lambay Island SAC.

The location of the relevant European Sites, in the context of the Proposed Development boundary, are illustrated at Figure 4.1. Conservation objectives of these sites are detailed within Table 4-1, below.

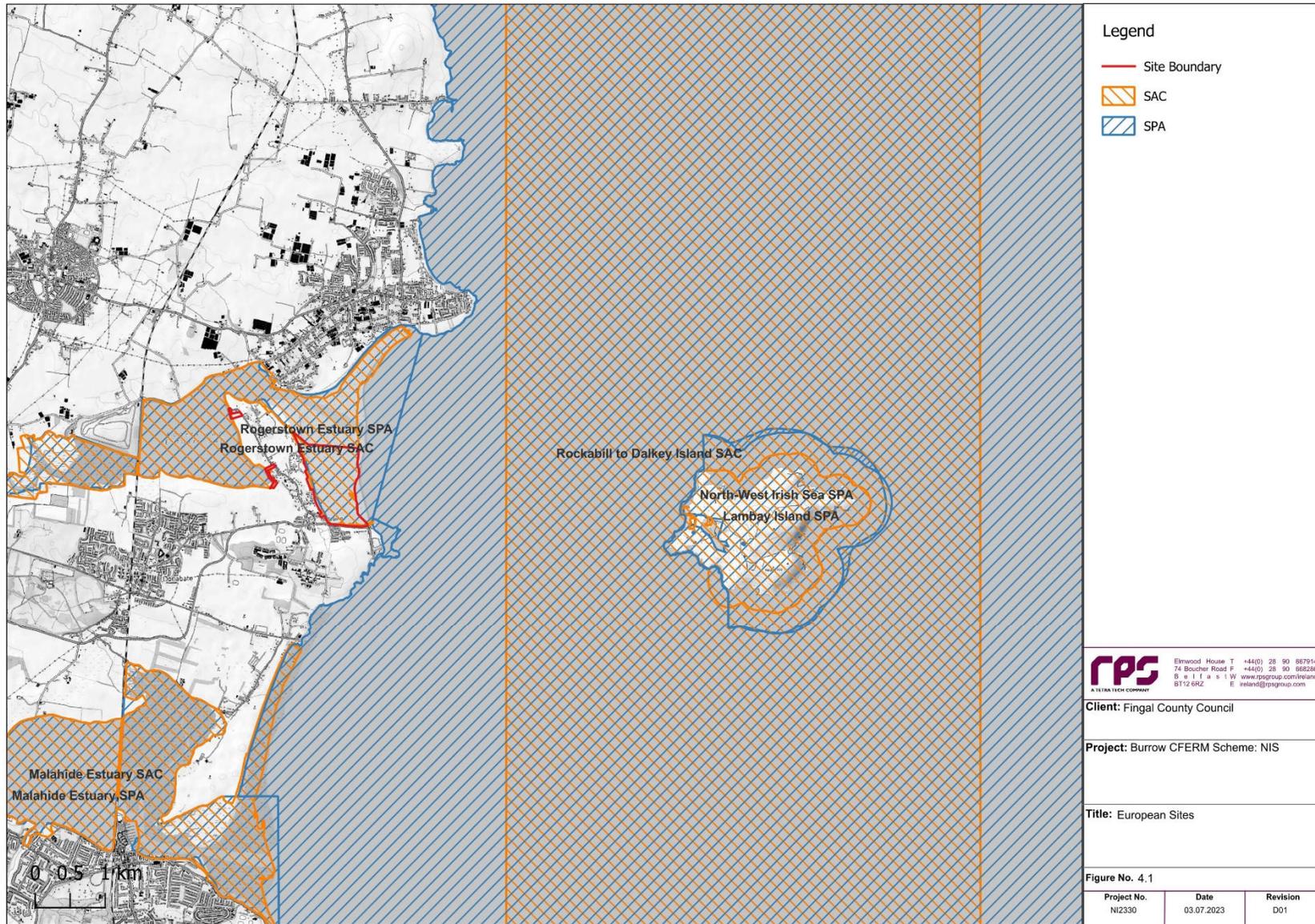


Figure 4.1 European Sites considered in the Screening Assessment

Table 4-1: Qualifying Interests and Conservation objectives of European sites considered

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed project																																				
IE000208	Rogerstown Estuary SAC	<p><b>Conservation Objectives Specific Version 1.0 (14/08/13)</b> To maintain the favourable conservation condition of the 7 no. Annex I habitat types in the SAC, as defined by a range of attributes and targets.</p> <p><b>Annex I Habitats</b></p> <ul style="list-style-type: none"> <li>Estuaries [1130]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Hectares</td> <td>The permanent habitat area (268ha) is stable or increasing, subject to natural processes.</td> </tr> <tr> <td>Community Extent</td> <td>Hectares</td> <td>Maintain the extent of the <i>Zostera</i>-dominated community and the <i>Mytilus edulis</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community Structure: Zostera density</td> <td>Shoots/m2</td> <td>Conserve the high quality of the <i>Zostera</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community structure: Mytilus edulis density</td> <td>Individuals/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Mytilus edulis</i>-dominated community, subject to natural processes</td> </tr> <tr> <td>Community Distribution</td> <td>Hectares</td> <td>Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i>, <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Mudflats and sandflats not covered by seawater at low tide [1140]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Hectares</td> <td>The permanent habitat area (370ha) is stable or increasing, subject to natural processes</td> </tr> <tr> <td>Community Extent</td> <td>Hectares</td> <td>Maintain the extent of the <i>Zostera</i>-dominated community and the <i>Mytilus edulis</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community Structure: Zostera density</td> <td>Shoots/m2</td> <td>Conserve the high quality of the <i>Zostera</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community structure: Mytilus edulis density</td> <td>Individuals/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Mytilus edulis</i>-dominated community, subject to natural processes</td> </tr> <tr> <td>Community Distribution</td> <td>Hectares</td> <td>Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i>, <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.</td> </tr> </tbody> </table>	Attribute	Measure	Target	Habitat Area	Hectares	The permanent habitat area (268ha) is stable or increasing, subject to natural processes.	Community Extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the <i>Mytilus edulis</i> -dominated community, subject to natural processes.	Community Structure: Zostera density	Shoots/m2	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes.	Community structure: Mytilus edulis density	Individuals/m <sup>2</sup>	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Community Distribution	Hectares	Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i> , <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.	Attribute	Measure	Target	Habitat Area	Hectares	The permanent habitat area (370ha) is stable or increasing, subject to natural processes	Community Extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the <i>Mytilus edulis</i> -dominated community, subject to natural processes.	Community Structure: Zostera density	Shoots/m2	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes.	Community structure: Mytilus edulis density	Individuals/m <sup>2</sup>	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Community Distribution	Hectares	Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i> , <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.	N/A Works will take place within the SAC boundary.
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		<p>Physical structure: flooding regime      Hectares flooded; frequency      Maintain natural tidal regime.</p> <p>Vegetation structure: zonation      Occurrence      Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.</p> <p>Vegetation structure: vegetation height      Centimetres      Maintain structural variation within sward.</p> <p>Vegetation structure: vegetation cover      Percentage cover at a representative sample of monitoring stops      Maintain more than 90% of area outside creeks vegetated.</p> <p>Vegetation composition: typical species      Percentage cover      Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).</p> <p>Vegetation structure: negative indicator species - <i>Spartina anglica</i>      Hectares      No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%.</p> <ul style="list-style-type: none"> <li>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Kilometres</td> <td>Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush – 1.25ha, Portrane – 1.31ha.</td> </tr> <tr> <td>Habitat Distribution</td> <td>Occurrence</td> <td>No decline or change, subject to natural processes.</td> </tr> <tr> <td>Physical structure: functionality and sediment supply</td> <td>Presence/ absence of physical barriers</td> <td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions.</td> </tr> <tr> <td>Vegetation structure: zonation</td> <td>Occurrence</td> <td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.</td> </tr> <tr> <td>Vegetation composition: plant health of dune grasses</td> <td>Percentage cover</td> <td>95% of marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present).</td> </tr> <tr> <td>Vegetation composition: typical species and sub-communities</td> <td>Percentage cover at a representative</td> <td>Maintain the presence of species-poor communities dominated by marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>).</td> </tr> </tbody> </table>	Attribute	Measure	Target	Habitat Area	Kilometres	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush – 1.25ha, Portrane – 1.31ha.	Habitat Distribution	Occurrence	No decline or change, subject to natural processes.	Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions.	Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Vegetation composition: plant health of dune grasses	Percentage cover	95% of marram grass ( <i>Ammophila arenaria</i> ) and/or lyme-grass ( <i>Leymus arenarius</i> ) should be healthy (i.e. green plant parts above ground and flowering heads present).	Vegetation composition: typical species and sub-communities	Percentage cover at a representative	Maintain the presence of species-poor communities dominated by marram grass ( <i>Ammophila arenaria</i> ) and/or lyme-grass ( <i>Leymus arenarius</i> ).	
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IE004015	Rogerstown Estuary SPA	<p><b>Conservation Objectives Specific Version 1.0 (20/05/13)</b>                      To maintain the favourable conservation condition of –</p> <ul style="list-style-type: none"> <li>11 no. overwintering species in the SPA, as defined by 2 no. attributes and targets; and</li> <li>wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as defined by 1 no. attribute and target.</li> </ul> <p><b>Special Conservation Interests</b></p> <ul style="list-style-type: none"> <li>Wintering Waterbirds including: Greylag goose (<i>Anser anser</i>) [A043], Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Shelduck (<i>Tadorna tadorna</i>) [A048], Shoveler (<i>Anas clypeata</i>) [A056], Oystercatcher (<i>Haematopus ostralegus</i>) [A130], Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Grey Plover (<i>Pluvialis squatarola</i>) [A141], Knot (<i>Calidris canutus</i>) [A143], Dunlin (<i>Calidris alpina</i>) [A149], Black-tailed Godwit (<i>Limosa limosa</i>) [A156] and Redshank (<i>Tringa totanus</i>) [A162].</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Population trend</td> <td>Percentage change</td> <td>Long term population trend stable or increasing</td> </tr> <tr> <td>Distribution</td> <td>Range, timing and intensity of use of areas</td> <td>There should be no significant decrease in the range, timing or intensity of use of areas by the relevant species other than that occurring from natural patterns of variation.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Wetland and Waterbirds [A999]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Target</th> <th>Measure</th> </tr> </thead> <tbody> <tr> <td>Wetland habitat area</td> <td>hectares</td> <td>The permanent area occupied by the wetland habitat should be stable and not significantly reduced, other than that occurring from natural patterns of variation.</td> </tr> </tbody> </table>	Attribute	Measure	Target	Population trend	Percentage change	Long term population trend stable or increasing	Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by the relevant species other than that occurring from natural patterns of variation.	Attribute	Target	Measure	Wetland habitat area	hectares	The permanent area occupied by the wetland habitat should be stable and not significantly reduced, other than that occurring from natural patterns of variation.	N/A Works will take place within the SPA boundary
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IE004236	North-West Irish Sea cSPA	<p><b>Conservation Objectives Specific Version 1.0 (19/09/23)</b></p> <ul style="list-style-type: none"> <li>Manx Shearwater (<i>Puffinus puffinus</i>) [A013]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Breeding population size</td> <td>Number</td> <td>No significant decline</td> </tr> <tr> <td>Spatial distribution</td> <td>Hectares, timing and intensity of use</td> <td>Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population</td> </tr> </tbody> </table>	Attribute	Measure	Target	Breeding population size	Number	No significant decline	Spatial distribution	Hectares, timing and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population	0.25 km						
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IE003000	Rockabill to Dalkey Island SAC	<p><b>Conservation Objectives Specific Version 1.0 (07/05/13)</b> To maintain the favourable conservation condition of the one no. Annex I habitat type in the SAC, as defined by three no. attributes and targets; and a single Annex II species in the SAC, as defined by two no. attributes and targets.</p> <p><b>Annex I Habitats</b></p> <ul style="list-style-type: none"> <li>Reefs [1170]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> </tbody> </table>	Attribute	Measure	Target	2.0 km																														
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IE000206	Lambay Island SAC	<p><b>Conservation Objectives Specific Version 1.0 (22/07/13)</b> To maintain the favourable conservation condition of the two no. Annex I habitat types in the SAC, as defined by a range of attributes and targets; and two no. Annex II species in the SAC, as defined by a range of attributes and targets.</p> <p><b>Annex I Habitats</b></p> <ul style="list-style-type: none"> <li>Reefs [1170]</li> </ul> <table border="0"> <tr> <td>Attribute</td> <td>Measure</td> <td>Target</td> </tr> <tr> <td>Habitat area</td> <td>Hectares</td> <td>The permanent area stable or increasing, subject to natural processes.</td> </tr> <tr> <td>Habitat distribution</td> <td>Occurrence</td> <td>No decline, subject to natural processes.</td> </tr> <tr> <td>Community structure</td> <td>Biological composition</td> <td>Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.</td> </tr> </table> <ul style="list-style-type: none"> <li>Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]</li> </ul>	Attribute	Measure	Target	Habitat area	Hectares	The permanent area stable or increasing, subject to natural processes.	Habitat distribution	Occurrence	No decline, subject to natural processes.	Community structure	Biological composition	Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.	4.2 km												
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		Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. Total length of cliff section mapped: 7.27km.	
		Habitat distribution	Occurrence	No decline subject to natural processes.	
		Physical structure: functionality and hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures.	
		Vegetation structure: zonation	Occurrence	Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession.	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward.	
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).	
		Vegetation composition: negative indicator species	Percentage	Negative indicator species (including non-natives) to represent less than 5% cover.	
		Vegetation composition: bracken and woody species	Percentage	Cover of bracken ( <i>Pteridium aquilinum</i> ) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%.	
		<b>Annex II Species</b>			
		<ul style="list-style-type: none"> <li>• Grey seal (<i>Halichoerus grypus</i>) [1364]</li> </ul>			
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IE000204	Lambay Island SPA	<p><b>Conservation Objectives Specific Generic (12/10/22)</b>                      To maintain or restore the favourable conservation condition of 10 no. bird species listed as special conservation interests in the SPA including:</p> <ul style="list-style-type: none"> <li>Fulmar (<i>Fulmarus glacialis</i>) [A009] - Breeding;</li> <li>Cormorant (<i>Phalacrocorax carbo</i>) [A017] - Breeding;</li> <li>Shag (<i>Phalacrocorax aristotelis</i>) [A018] - Breeding;</li> <li>Greylag goose (<i>Anser anser</i>) [A043] – Wintering;</li> <li>Lesser black-backed gull (<i>Larus fuscus</i>) [A183] – Breeding;</li> </ul>	4.2 km																																	

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IE004014	Rockabill SPA	<p><b>Conservation Objectives Specific Version 1.0 (08/05/13)</b>            To maintain the favourable conservation condition of –</p> <ul style="list-style-type: none"> <li>One no. overwintering species in the SPA, as defined by 2 no. attributes and targets; and</li> <li>Three no. breeding tern species in the SPA, as defined by 6 no. attributes and targets.</li> </ul> <p><b>Special Conservation Interests</b></p> <ul style="list-style-type: none"> <li>Purple sandpiper (<i>Calidris maritima</i>) [A148]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Population trend</td> <td>Percentage change</td> <td>Long term population trend stable and increasing.</td> </tr> <tr> <td>Distribution</td> <td>Range, timing and intensity of use of areas</td> <td>No significant decrease in the range, timing or intensity of use of areas by purple sandpiper other than that occurring from natural patterns of variation.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Roseate tern (<i>Sterna dougallii</i>) [A192]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Breeding population abundance: apparently occupied nests (AONs)</td> <td>Number</td> <td>No significant decline.</td> </tr> <tr> <td>Productivity rate: fledged young per breeding pair</td> <td>Mean number</td> <td>No significant decline.</td> </tr> <tr> <td>Distribution: Breeding colonies</td> <td>Number, location, area (ha)</td> <td>No significant decline.</td> </tr> <tr> <td>Prey biomass available</td> <td>Kilograms</td> <td>No significant decline.</td> </tr> </tbody> </table>	Attribute	Measure	Target	Population trend	Percentage change	Long term population trend stable and increasing.	Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by purple sandpiper other than that occurring from natural patterns of variation.	Attribute	Measure	Target	Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline.	Productivity rate: fledged young per breeding pair	Mean number	No significant decline.	Distribution: Breeding colonies	Number, location, area (ha)	No significant decline.	Prey biomass available	Kilograms	No significant decline.	7.5 km
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## 4.2 Likely Significant Effects Identified in the Screening for Appropriate Assessment.

### 4.2.1 Habitat Loss

#### 4.2.1.1 Rogerstown Estuary SAC

The Proposed Development at the Burrow will involve the construction of a 190m long embankment at the end of Burrow Road and the construction of a 130m long sheet-piled flood wall and 200m embankment along Marsh Lane. These works will largely take place within the terrestrial environment. A large proportion of the proposed wall and embankment length lies within the boundary of the Rogerstown Estuary SAC. This includes areas of scrub, recolonising hardstanding, hardstanding, areas of dense bracken and largely dry meadows/ grassy verges habitat which lie along the western shore of the Burrow. In addition, areas of Annex I saltmarsh, perennial vegetation of stony banks and intertidal mud and sandflats and estuarine habitats of which Atlantic salt meadows [1330], mudflats and sandflats not covered by sea water at low tide [1140] and Estuaries [1130] are included as qualifying interests of the SAC and will likely be affected by the construction of proposed flood wall and embankments on the western shore of the Burrow.

The Proposed Development will also involve the construction of seven fishtail groynes along a 1.3km length of the eastern coastline of the Burrow and associated beach renourishment. The footprint of these structures will be within areas of intertidal mudflats and estuarine habitat, with some limited areas of shingle and gravel banks which are representative of Annex I habitat: [1220] Perennial vegetation of stony banks. This habitat is not a Qualifying Interest of Rogerstown Estuary SAC. The majority of areas of mixed sediment shores and intertidal estuarine habitat are considered to be representative of mudflats and sandflats not covered by sea water at low tide [1140] which is included as a qualifying interest of the SAC.

Any areas of Annex I habitat within the footprint of the proposed flood walls, embankments and fishtail groynes will be permanently lost as a result of the construction. Further areas of the habitat are likely to be temporarily lost or adversely impacted as a result of temporary construction effects within the proposed working area, which is considerably larger than the delivered footprint of the proposed infrastructure and is inclusive of beach renourishment works in addition to access to areas of adjacent intertidal and terrestrial habitat.

Annex I saltmarsh and sand dune habitats have been subject to survey by BEC Consultants in 2021. The full methodology and findings of these surveys have been set out within an Annex I Habitat Survey Report which is appended to the accompanying EIA (Appendix 13B). The findings of these surveys, principally the distribution of Annex I habitats within the proposed working areas and their surrounds are illustrated at Figure 4.2, Figure 4.3, Figure 4.4 and Figure 4.5. These findings illustrate that the proposed development will give rise to the temporary or permanent loss of areas of Annex I QI Atlantic salt meadows and Mediterranean salt meadows habitat in addition to Annex I non-qualifying perennial vegetation of stony banks and annual vegetation of drift lines habitat and potential temporary loss of areas of Annex I QI fixed dunes with herbaceous vegetation (grey dunes) limited to areas which are within the working area but are unlikely to be subject to any significant works.

The accompanying EIA, at Chapter 12, sets out an assessment of the potential effects upon intertidal and marine habitats which are likely to arise at construction and operational stage of the Proposed Development. Relevant parts of this assessment have been reproduced here.

The entire marine and intertidal working area of the Proposed Development and wider estuary has been subject to site-specific intertidal survey was carried out by ASU, across the Rogerstown Estuary in May 2022 (ASU, 2022). The survey comprised a Phase 1 intertidal walkover survey with Phase 2 sampling across the survey area. A total of 28 soft-sediment stations were sampled for benthic assessment and 30 stations were assessed as areas of biological or physical interest. Further data was collected from 30 intertidal reef locations during the survey. The intertidal soft sediment sampling involved collecting

the upper 10cm of a 20cm x 20cm quadrat and sieving contents through a 0.5mm mesh sieve. Retained macrofauna was then identified to species level (where possible) and quadrats were dug to 30cm to check for deeper taxa. These surveys complemented a desk study of the distribution of marine habitats within the working area and adjacent areas.

Information from the survey data was used to assign habitat codes based on the European Nature Information System (EUNIS), (European Environment Agency (EEA), 2022). These are presented relative to the Proposed Development in Figure 4.6.

Habitats recorded within intertidal and marine portions of the proposed working area were limited to the habitats MA5-233 (Amphipods and polychaete worm *Scolelepis* spp. In Atlantic littoral medium-fine sand), MA5-231 (Barren Atlantic littoral coarse sand), MA5-2332 (Speckled sea louse *Eurydice pulchra* in Atlantic littoral mobile sand), MA5-2412 Polychaetes and tellin shell *Angulus tenuis* in Atlantic littoral fine sand and a small area of MA5-25 (Polychaete/bivalve-dominated Atlantic littoral muddy sand). All other marine and intertidal habitat types were located outside of the proposed working area and will not be directly affected by the Proposed Development. Of the habitats which lie within the working area and subject to daily tidal inundation, all are considered to be representative of Annex I mudflats and sandflats not covered by seawater at low tide.

On the basis of the information presented in Table 4-1 and above, it is envisaged that the Proposed Development will give rise to permanent or temporary loss of significant areas of Annex I habitats which are qualifying interests of the SAC, this includes areas of Annex I mudflats and sandflats, estuaries, salt meadows (Mediterranean and Atlantic) and grey dunes, in addition to non-qualifying Annex I habitats perennial vegetation of stony banks and annual vegetation of drift lines.

The extent and duration of any Annex I habitat loss resultant from the project has been set out below in respect of the three discrete areas proposed for works namely Marsh Lane, Burrow Road and the Burrow Eastern Shore.

### Marsh Lane

Proposals at Marsh Lane include the construction of a 200m flood embankment and 130m flood wall and the associated siting of a construction compound, within an adjacent agricultural field.

The extent of the proposed development footprint at Marsh Lane is illustrated at Figure 4.2.

In total the proposals at Marsh Lane will result in the permanent loss of an area of QI Atlantic salt meadows [1330] of 1.6m<sup>2</sup> inclusive of the footprint of the proposed embankment only. This represents 0.00043% of the Atlantic salt meadows supported within the Rogerstown Estuary SAC, as per the 2013 conservation objectives. All other aspects of the proposed development footprint will not result in any further permanent losses to habitats beyond temporary effects as discussed below.

Further temporary impacts associated with the movement of construction machinery within the working area will give rise to potential temporary loss of approximately 0.18ha of Atlantic salt meadows [1330] and 60m<sup>2</sup> of Mediterranean salt meadows [1410].

It is considered that the movement of excavators and other tracked vehicles within the proposed working area which, as stated above, is inclusive of areas of Atlantic and Mediterranean salt meadows, will give rise to at least temporary loss of some saltmarsh vegetation within the affected areas. Such adverse impacts upon vegetation, and the associated deterioration of habitat quality, has already been recorded within areas of Atlantic salt meadows habitat within the Rogerstown Estuary SAC, as detailed within BEC Consultants 2021 report. This disturbance through vehicle movements, in addition to the presence of unofficial infilling of saltmarsh habitats, was identified as contributing significantly to the 2021 unfavourable condition assessment for Atlantic salt meadows.

McCorry and Ryle (2009) identified that the formation of tracks, including non-permanent tracks created by farm machinery and livestock, were generally resultant in a low negative impact upon both Atlantic salt meadows and Mediterranean salt meadows throughout Ireland. Such impacts were described as

being distinct from the creation of permanent tracks within these habitats, which was described as resulting in irreparable damage.

Numerous studies have recorded that temporary disturbance associated with vehicular disturbance to salt marsh habitats and/or similar sources of disturbance such as digging gives rise to relatively long-term impacts to salt marsh habitats (Blionis and Woodin 1999, Kelleway 2006). Established vehicle tracks in saltmarsh have been shown to support up to 90% lower vegetative coverage and 50% lower species diversity (Schofield 2016) with associated impacts to the seed bank attributed to soil compaction. De Leeuw et al. (1992) recorded that the type of disturbance was related to the extent of negative impacts and the associated regeneration time. Controlled application of herbicide and digging disturbance resulted in the dug plots taking significantly longer to recolonise with altered final species composition which was attributed to increased soil aeration.

Schofield (2016) identified that in places where saltmarsh habitats have been subject to soil compaction associated with vehicular movements, active restoration measures may be required to ensure that soil conditions are optimised for recolonisation by saltmarsh plants. Such measures may include the post construction levelling of soils and transplantation of vegetation. It is noted however that the studied areas, subject to compaction, had been impacted over the fairly long term. Hutchings and Russell (1989) recorded, in a study on saltmarsh seed viability, that areas which supported high densities of saltmarsh vegetation also supported well supplied seed banks. This study also recorded that the extent to which regeneration of vegetation would occur, and the speed of this change, was highly related to the presence of surrounding vegetation and influenced by the duration of disturbance, given that the seed bank is not persistent and as such would only be significantly affected by disturbance lasting over several years.

On the basis of the above, it is considered that any temporary impacts to Atlantic salt meadows and Mediterranean salt meadows habitats associated with the movement of excavators and other construction machinery would give rise to the temporary loss (short to medium term) of these habitats. It is recommended that mitigation measures are implemented to address such temporary impacts.

### **Burrow Road**

Proposals at Burrow Road, in the north-west of the project site, include the creation of a 190m flood embankment around residential properties in this area and the associated siting of a construction compound.

The extent of the proposed development footprint of the proposed development at Burrow Road is illustrated at Figure 4.3.

No aspects of permanent development, namely the proposed embankment at Burrow Road, will result in the loss of Annex I habitat.

In total the proposals at Burrow Road will give rise to the temporary loss of an area of up to approximately 40m<sup>2</sup> of perennial vegetation of stony banks [1220] Annex I habitat.

No conservation objectives have been set for this non-qualifying Annex I habitat within the SAC. As such no adverse effects upon the integrity of the site are predicted to occur as a result of these habitat loss effects. Further assessment of the potential effects upon non-qualifying Annex I habitats as a result of the proposed project is set out within the Terrestrial Biodiversity Chapter of the accompanying EIAR.

### **Burrow Eastern Shore**

Proposals for the eastern shore of the Burrow will involve the construction of seven fishtail groynes along a 1.3km length of the eastern coastline of the Burrow and associated beach renourishment.

The extent of the proposed development footprint at the eastern shore of the Burrow is illustrated at Figure 4.4 and Figure 4.5 in the context of relevant sand dune Annex I habitats. The extent of marine and intertidal habitats in this location are illustrated at Figure 4.6.

It is noted that a large proportion of the areas of intertidal mudflat and estuaries included within the working area and potentially subject to temporary impacts, will not be subject to any significant works.

These portions of the working area comprise the areas in which the dredge vessel and associated sinker pipeline for beach renourishment will be temporarily located. Proposed works within these areas of habitat are therefore limited and unlikely to give rise to any short or medium-term habitat loss effects upon either Annex I intertidal mudflat or estuary habitat.

Permanent losses to annex I habitat are limited to areas within the footprint of the groyne structures, all of which are considered to be representative of Annex I mudflats and sandflats not covered by sea water at low tide [1140].

**Table 4-2 Sensitivity of benthic habitats to physical change to seabed**

<b>Benthic habitat type (littoral sand)</b>	<b>Description</b>	<b>Sensitivity to physical change to another seabed type</b>
MA5-231	Barren Atlantic littoral coarse sand	High
MA5-233	Amphipods and polychaete worm <i>Scolelepis</i> spp. In Atlantic littoral medium-fine sand	High
MA5-2332	Speckled sea louse <i>Eurydice pulchra</i> in Atlantic littoral mobile sand	High
MA5-2412	Polychaetes and tellin shell <i>Angulus tenuis</i> in Atlantic littoral fine sand	High
MA5-25	Polychaete/bivalve-dominated Atlantic littoral muddy sand	(not assessed)

On the basis of Table 4-2 Sensitivity of benthic habitats to physical change to seabed, in addition to the above information it is considered that the relevant intertidal habitats which have been recorded within the footprint of the development and within the working area are sensitive to permanent changes to the supported seabed. It is therefore considered that the Proposed Development is likely to give rise to the permanent loss of a minimum area of 1.36ha of Annex I Mudflats and sandflats not covered by seawater at low tide [1140].

Potential temporary losses of variable severity to areas of this habitat within proximity to the Proposed Development footprint may also occur as a result of the proposed beach renourishment and the movement of construction vehicles required to facilitate construction of proposed groynes. A predicted maximum area over which temporary effects may occur is considered to be around 12.5ha, inclusive of areas of intertidal habitat which are to be affected as a result of proposed groyne construction and proposed beach renourishment, not including the footprint of the proposed groynes themselves. Other activities within the working area associated with proposed beach renourishment, namely the use of the sinker pipeline, are not predicted to give rise to any short-term habitat loss effects.

According to guidance on evidence-based sensitivity assessment, the benthic habitat receptors in and around the Proposed Development are considered to have biological sensitivities ranging between 'not sensitive' to 'low' (Table 4-3 Sensitivity of benthic habitats to abrasion/ disturbance of the substrate). Related to pressures from vehicle movements, sensitivities to abrasion/disturbance have been considered, and related to beach renourishment, sensitivities to heavy sedimentation have been considered.

Table 4-3 Sensitivity of benthic habitats to abrasion/ disturbance of the substrate

Benthic habitat type (littoral sand)	Description	Sensitivity to abrasion/ disturbance of the surface of the substratum or seabed
MA5-231	Barren Atlantic littoral coarse sand	Not sensitive
MA5-233	Amphipods and polychaete worm <i>Scolecopsis</i> spp. In Atlantic littoral medium-fine sand	Low
MA5-2332	Speckled sea louse <i>Eurydice pulchra</i> in Atlantic littoral mobile sand	Low
MA5-2412	Polychaetes and tellin shell <i>Angulus tenuis</i> in Atlantic littoral fine sand	Low
MA5-25	Polychaete/bivalve-dominated Atlantic littoral muddy sand	Low

The renourishment works (area covered c.1.12 km<sup>2</sup>) will involve transporting dredged material from a licensed nourishment extraction area (presently assumed to be Liverpool Bay) and pumped ashore via a sunken pipeline. For the beach renourishment works, it is envisaged that all c.425,000m<sup>3</sup> of material could be transported to Portrane Beach within approximately 6 weeks.

Whilst this will lead to a loss/disturbance of benthic habitats and communities (e.g., through smothering of sediments and associated species under deposited material in the short term, over time the sediment will be re-worked through hydrodynamic processes which will allow communities to recover into the affected areas. All intertidal habitats within the proposed working area are noted as being of low sensitivity to abrasion or disturbance to the surface of the seabed.

In marine soft sediments, restoration from disturbance is possible through physical processes, like wave actions, and biological processes, like bioturbation (Dernie et al., 2003). Nelson (1989) recorded that various faunal groups associated with intertidal sandflats were relatively unaffected by beach nourishment works with various burrowing invertebrates recorded to have low mortality rates where nourishment had been undertaken and shown to simply burrow through such substrates to the new surface of the intertidal sands. This appears to be a natural adaptation of benthic invertebrates to natural processes giving rise to altered sediment depths in intertidal sand and mud and has also been observed in a number of further studies (Löffler and Coosen 1995; Miller et al. 2002). Where large quantities of material are to be deposited this resilience to sediment deposition may not be relevant (Jaramillo et al. 1996; Moffett et al. 1998) and large-scale invertebrate mortality may nonetheless occur, especially where the proposed depth of renourishment is deep and to be applied rapidly. Areas of shallower application towards the shore may be less severely affected (Schlacher et al. 2012).

Menn et al. (2003), in a study of the effects of beach nourishment upon habitats similar to those relevant to the project, recorded that beach nourishment led to a decreased abundance of macrofauna within sub-tidal zones up to nine months following the works. However, they conclude that such changes are minimal when viewed in the context of natural changes from sediment transport along the shore and across time.

Where sediments are to be 'like for like' in grain structure it is anticipated that supported fauna is likely to begin to recolonise following the dispersive, larval, stage of the life cycle and associated juvenile settlement (Speybroeck et al. 2007), i.e. within a minimum of a single calendar year, within areas of MA5-233 Amphipods and polychaete worm *Scolecopsis* spp. In Atlantic littoral medium-fine sand habitat.

A study by Kindeberg et al. (2023) found beaches in San Diego, California, had full species richness recovered 15 months after nourishment, though stressed the importance of using similar grain sizes between the recipient beach and nourishment material; sediments too coarse and sediments too fine-grained had a negative effect on recoverability. This finding concurs with various studies which recorded recovery of infaunal species richness following nourishment of between one month (Nelson and Gorzelany 1983) and two years (Rakocinski et al. 1996).

On the basis of the above information, it is considered that the proposed beach nourishment works are likely to give rise to temporary loss of habitat of up to two years duration in a worst-case scenario, of an area inclusive of 12.01ha (the total area proposed for beach renourishment works).

A limited amount of short-term temporary habitat disturbance arising from the displacement/compaction of the intertidal zone is likely to arise, particularly from heavy plant which will be used for construction of the groyne structures and the movement of the sinker pipeline for beach renourishment. Impacts through alteration to sediments can occur where compaction occurs during the process, resulting in lower supported abundances of burrowing invertebrates (Lindquist and Manning 2001).

It is considered that changes to intertidal habitats arising through vehicular movements are likely to be minor in comparison to natural sediment transport processes which occur through storm events and in the context of their temporary and short-term nature. Natural sediment transport is likely to occur closely following completion of the works giving rise to levelling of the substrate and replenishing uncompacted surface layers and associated recovery of infaunal communities (Schoeman et al. 2000) and as discussed above in respect of the proposed renourishment works. It is estimated that such impacts would occur over an area of approximately 1ha of habitat, in addition to areas proposed for beach renourishment.

Permanent losses to Annex I mudflats and sandflats habitat through placement of the groynes are predicted to represent a total of 0.37% of the total area of this Annex I QI habitats within the SAC. Temporary habitat loss, of variable duration, is predicted to occur to a further estimated 3.52% of the habitat through beach renourishment and the movement of construction machinery. No further habitat loss, permanent or temporary is predicted to arise within the wider working area, through the movement of the sinker pipeline and dredge vessel.

The proposed works along the eastern shore of the Burrow will also involve beach renourishment works within areas which have been recorded to support the QI Annex I habitat fixed dunes with herbaceous vegetation (grey dunes) [2130], at the northern extent of the eastern shore works (see Figure 4.5). This area is relatively small (0.22 ha) and is inclusive of the southern extent of a wider dune system which is present to the north.

The conservation objectives supporting document for coastal habitats within the Rogerstown Estuary SAC (NPWS 2013) list sea defences as a threat for dune habitats as they can interrupt longshore drift and associated increased erosion or starvation of dune systems. It is acknowledged within this document that erosion is part of the natural processes acting upon a dune system.

It is noted that surveys of Annex I coastal habitats undertaken by BEC Consultants in 2021 (Appendix 13B of the accompanying EIAR) recorded that Annex I grey dune habitat (2130) along the eastern shore of the Burrow has been subject to a significant decrease in area through erosion of the shore. In some places this has been recorded to include a 20m wide strip of grey dune habitat when compared to the most recent previous surveys undertaken in 2014. This recorded erosion of grey dunes is concurrent with the risk to properties arising from such erosion which has necessitated the proposed project.

As a result of such erosion events, grey dunes along the eastern shore of the Burrow, within the areas proposed for works, exist in a narrow band of remnant dune present between a steep eroded cliff-edge and areas of non-annex habitat further inland including, in many cases, areas of existing development. Some embryonic dune structures were recorded at the base of this cliff indicating some recovery. However, under predicted models for storm events and associated erosion it is envisaged that further erosion events would further endanger the narrow band of remaining grey dune habitat in this area and destroy recovering embryonic dune communities at the base of the existing erosion cliffs.

Beach nourishment as a method for protecting coastlines from erosion, is used in many locations to assist in nourishing existing dune structures specifically, principally to reinforce their function as sea defences whilst also achieving conservation of the dune habitats themselves (Hanson et al. 2002). This dune protection was especially relevant for dune systems which were close to shore (Costa et al. 2023). This is considered to be directly relevant to the dune structure along the eastern shore of the Burrow which as discussed, is subject to significant erosion.

Foreshore beach nourishment has been shown to result in the protection of supratidal areas of upper dune from erosion (Van der Wal 2004). In some previous cases the formation of a native dune structure, progressing to Annex I white dunes habitat, through the associated use of planting of nourished material with *Ammophila* which has been recorded to be successful in generating large areas of dune habitat (Hanley et al. 2013). In previous examples of beach nourishment schemes the initial nourishment was followed by long-term dune accretion (Kaczkowski et al. 2017) which is considered likely to be favourable for the recovery of existing dune structures at the Burrow. This is evidenced by further studies which have recorded beach nourishment works to give rise to increased and significant establishment of embryonic dunes (Bezzi et al. 2009).

While it is envisaged that there will be short-term habitat loss effects upon grey dune habitats within the footprint of areas proposed for beach renourishment at the Burrow, associated with the deposition of dredge material, it is considered that the long-term result of proposed beach renourishment will give rise to increased protection of dune from erosion. In addition, it is envisaged that proposed beach renourishment will result in the formation of a healthier dune structure, resembling that which has been lost from the eastern shore of the Burrow as a result of large-scale coastal erosion. Long-term effects are therefore considered positive, and no long-term habitat loss is considered likely to occur.

While some discussion has been had on the extent to which the introduction of nourishment material may give rise to altered soil conditions for dune vegetation, and particularly an increase in the levels of supported phosphorous, a recent study has demonstrated that measured phosphorus levels were not discernibly different or resulting in an impact on dune vegetation after a period of four years (Pit et al. 2020). As such it is not considered that any habitat loss would arise through this mechanism as a result of beach nourishment works.

In addition to QI annex I habitats of the Rogerstown Estuary SAC, further areas of non-qualifying Annex I habitat will be temporarily affected as a result of the proposed works along the eastern shore of the Burrow including:

- The temporary loss of 0.04ha of Perennial vegetation of stony banks [1220] habitat to facilitate the proposed beach renourishment works.
- The temporary loss of 0.018ha of Perennial vegetation of stony banks [1220] habitat to facilitate siting of the proposed site compound.
- The permanent loss of 6m<sup>2</sup> of Annual vegetation of driftlines [1210] to facilitate placement of proposed groyne structures.
- The temporary loss of 0.34ha of Annual vegetation of driftlines [1210] to facilitate proposed beach renourishment.

While further areas of Annual vegetation of driftlines habitat is present within the wider proposed working area, it is predicted that these areas lying away from proposed groyne structures shall not be subject to any habitat loss.

No conservation objectives have been set for these non-qualifying Annex I habitats within the SAC. As such no adverse effects upon the integrity of the site are predicted to occur as a result of these habitat loss effects. Further assessment of the potential effects upon non-qualifying Annex I habitats as a result of the proposed project is set out within the Terrestrial Biodiversity Chapter of the accompanying EIAR.

## Summary

The respective areas of these Annex I coastal habitats which are to be affected by the Proposed Development and the relative percentages of the habitat within the context of the wider SAC which they

represent are set out at Table 4-4, inclusive of areas to be lost either permanently or temporarily as a result of the construction phase of the Proposed Development.

The loss of habitat which will occur to various QI Annex I habitats of the Rogerstown Estuary SAC, as discussed above, is considered to represent a permanent or temporary adverse effect upon the favourable conservation status of these QIs. Habitat area is listed as an attribute of the conservation objectives for each of these habitats with an associated target for the area to be stable or increasing subject to natural processes.

No mitigation measures would eliminate the need for such habitat losses to occur as a result of the development, with such effects being a consequence of the nature and location of the Proposed Development.

As such it is considered that the Proposed Development will give rise to an adverse effect upon the integrity of the Rogerstown Estuary SAC as a result of habitat loss at construction stage.

Mitigation measures are recommended to decrease the severity of temporary impacts arising through construction phase disturbance of habitats and through proposed beach renourishment works.

Table 4-4 Construction Phase Impacts to Rogerstown Estuary SAC Annex I Habitats

<b>Annex I Habitat</b>	<b>Approximate Development Footprint: Permanent Loss (ha)</b>	<b>Approximate Working Area: Temporary Impacts (ha)</b>	<b>Total Area Within the SAC Conservation Objectives (2013) (ha)</b>	<b>Percentage Area Permanently Affected [Temporarily Affected] (%)</b>
<b>Atlantic Salt Meadows (1330)</b>	0.00016	0.18	37.2	0.00043 [0.48]
<b>Mediterranean Salt Meadows (1410)</b>	-	0.006	2.18	- [0.28]
<b>Mudflats and sandflats not covered by seawater at low tide (1140)</b>	1.36	12.01	370	0.37 [3.25]
<b>Estuaries (1130)</b>	-	-	268	-
<b>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</b>	-	0.02	2.56	- [0.78]
<b>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</b>	-	0.79	8.37	- [9.44]
<b>Annual vegetation of drift lines [1210] (Non-qualifying)</b>	0.0006	0.34	-	-
<b>Perennial vegetation of stony banks [1220] (Non-qualifying)</b>	-	0.062	-	-
<b>Embryonic shifting dunes [2110] (Non-qualifying)</b>	-	-	-	-

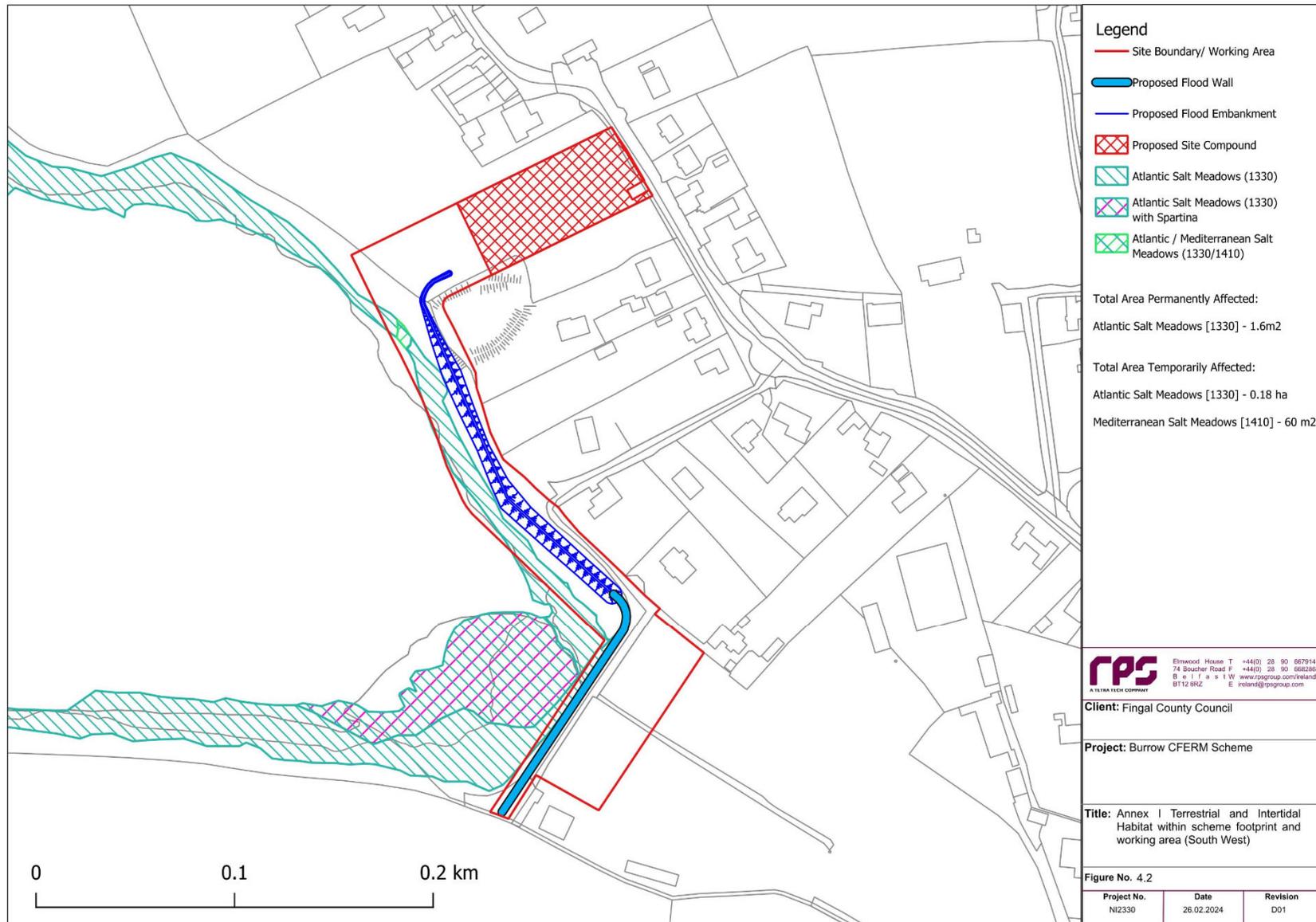


Figure 4.2 Annex I terrestrial and intertidal habitats within the Burrow project footprint and working area (South-West)



Figure 4.3 Annex I terrestrial and intertidal habitats within the Burrow project footprint and working area (North-West)

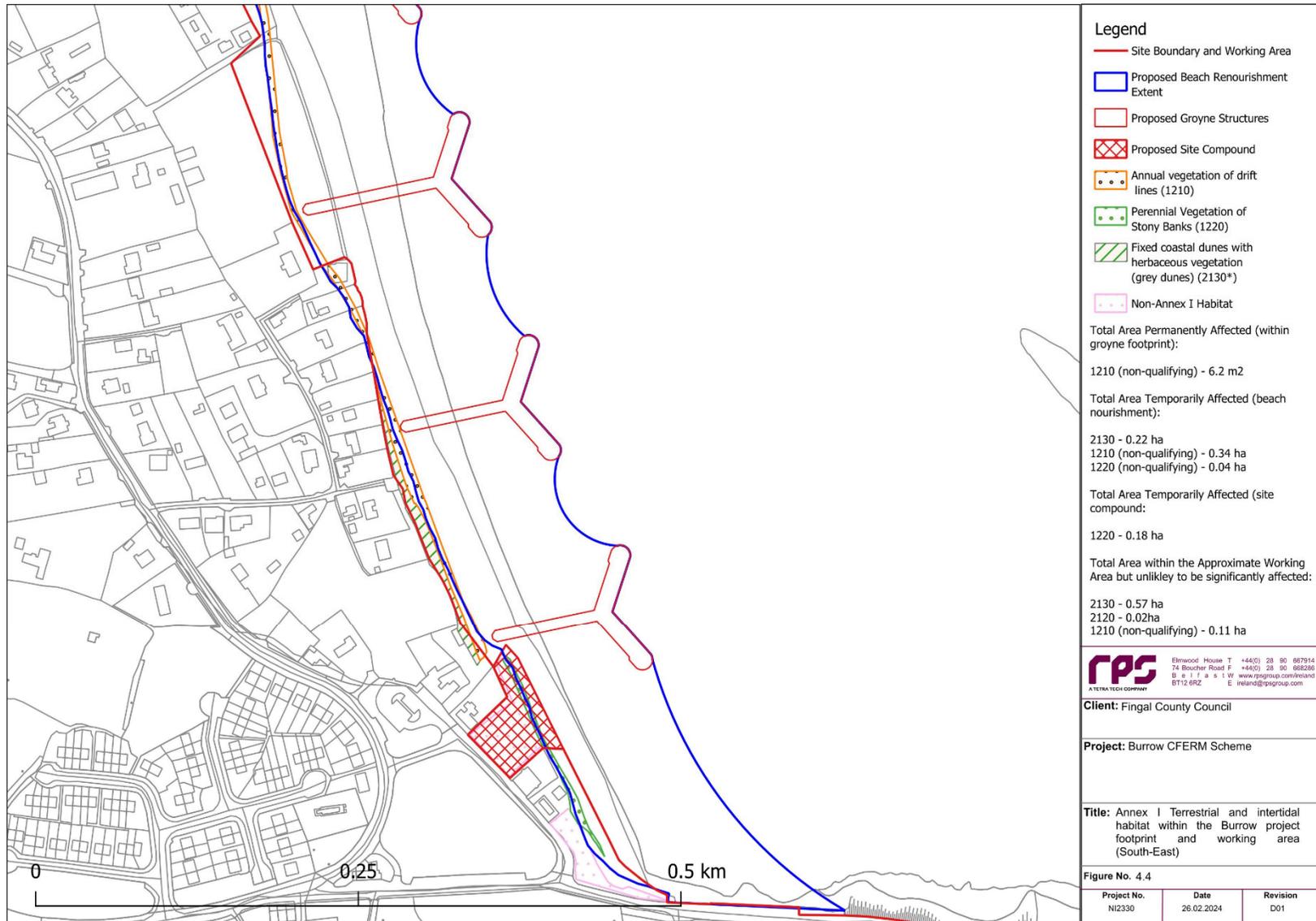


Figure 4.4 Annex I terrestrial and intertidal habitats within the Burrow project footprint and working area (South-East)

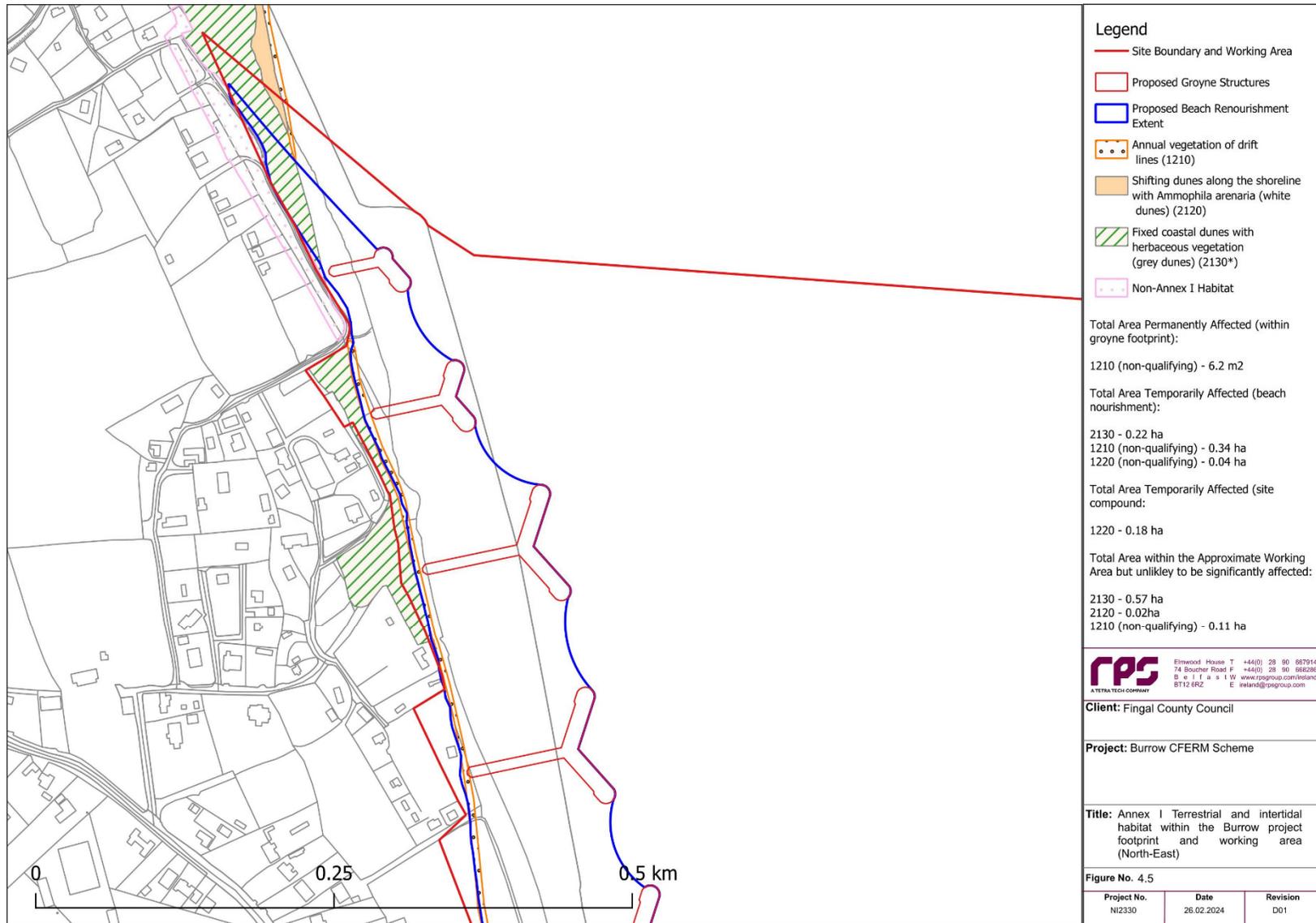


Figure 4.5 Annex I terrestrial and intertidal habitats within the Burrow project footprint and working area (North-East)

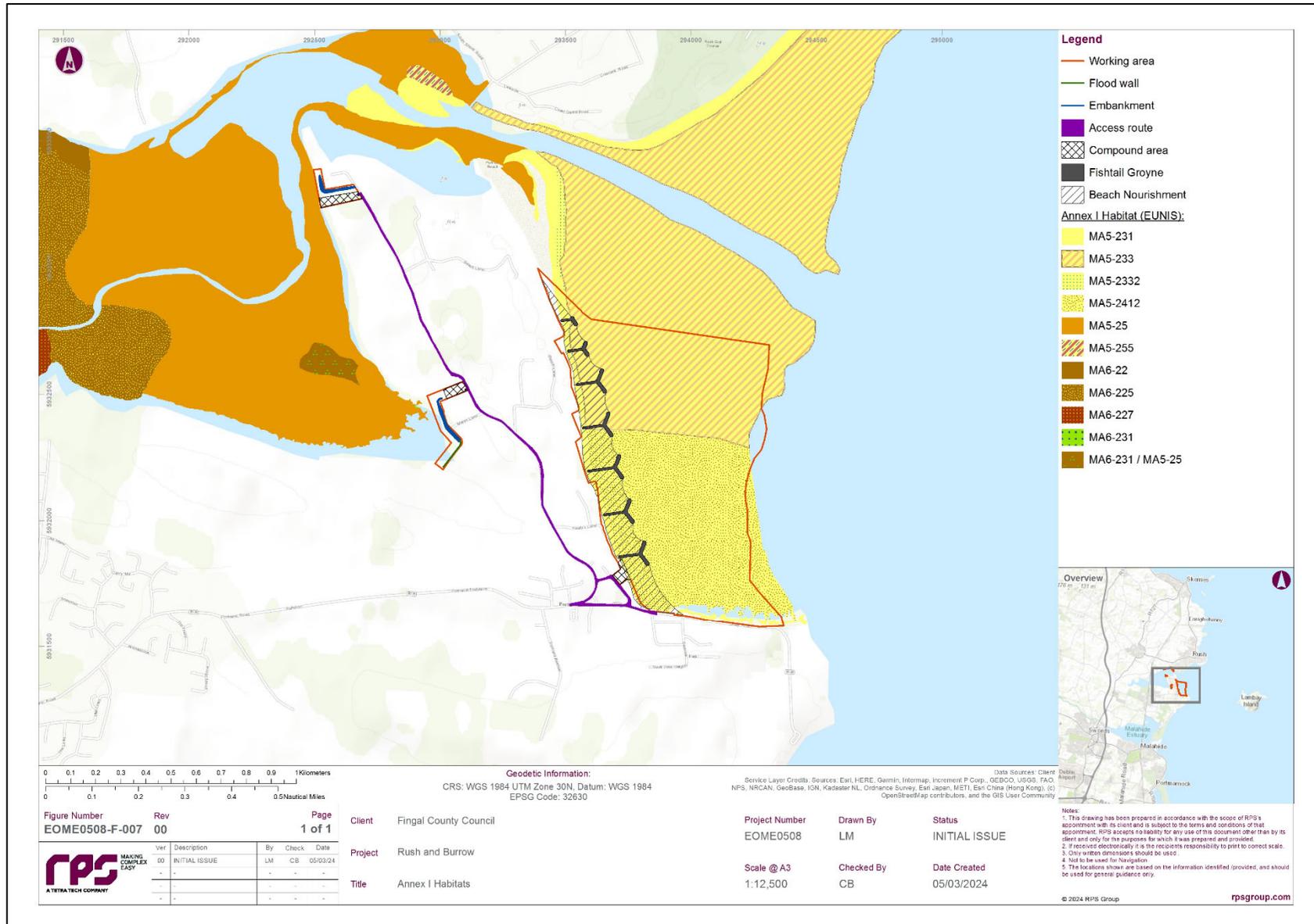


Figure 4.6 Marine habitat types present at, and in the vicinity of, the Burrow

#### 4.2.1.2 Rogerstown Estuary SPA

In order to assess the potential implications of the proposed development upon waders and waterbirds, comprising special conservation interests (SCIs) of the SPA and otherwise, a suite of bird surveys has been undertaken of the coastal and estuarine habitats within the study area, in addition to adjacent areas of terrestrial habitat, where relevant.

These bird surveys undertaken of the site and surroundings utilised a wetland bird survey methodology, based on the BTO's wetland bird survey (WeBS) Core Counts which use the so-called 'look-see' method (Bibby *et al.*, 2000), whereby the observer, familiar with the species involved, surveys the whole of a predefined area and included four survey visits per month with a range of tidal states captured across a calendar year. These surveys also recorded breeding bird activity, within the relevant times of year, within areas of land adjacent to the shoreline, throughout the proposed project working area.

Further information on the methodology and findings of these surveys is set out within the Bird Survey Report which accompanies the submitted EIAR (Appendix 13C).

The findings of these surveys, in respect of each of the SCI species of the Rogerstown Estuary SPA, are illustrated in Figure 4.7- Figure 4.16, below. It is noted that a single SCI species, greylag goose *Anser anser*, was entirely absent from the survey results.

In addition, Table 4-5 sets out the mean and peak counts of each of these species recorded across the winter months (October to March) within the proposed working area in the context of the mean and peak counts recorded across the wintering periods within the entire survey area, the baseline population listed as site selection criteria (NPWS 2013g) and the most recent available census data on the supported populations of the Rogerstown Estuary SPA (Birdwatch Ireland I-Webs data 2022/2023).

In summary, the proposed working areas and adjacent areas of intertidal wetlands were recorded to support populations of wintering SCI bird species associated with the Rogerstown Estuary SPA, including significant proportions of the SPA populations of these species. It is noted however that areas to the east of the Burrow were of comparatively lower importance for a large number of the SCI species, as illustrated on the relevant figures. It is also noted that no areas of the SPA within or in close proximity to the proposed works were relied upon by any SCI species exclusively during any particular tidal state. Other areas of suitable habitat, at any given tidal state and throughout the wintering period are available for each of the SCI species within the wider SPA and it is noted that the surveys undertaken to inform the application generally recorded areas to the west of the Burrow to be of relatively higher significance for the supported assemblage of waterbirds throughout the tidal range.

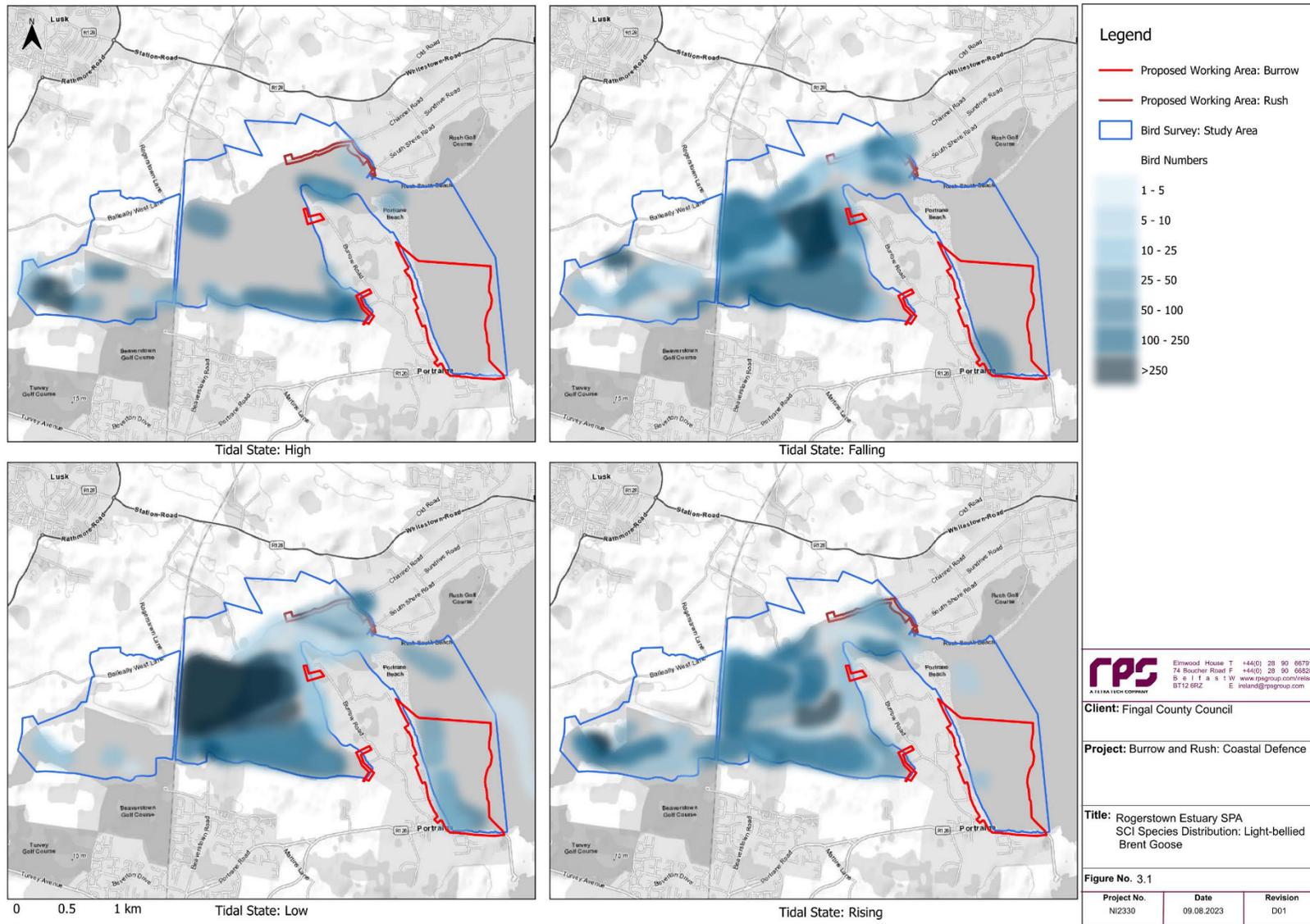


Figure 4.7 Wetland Bird Survey Results: Brent Goose

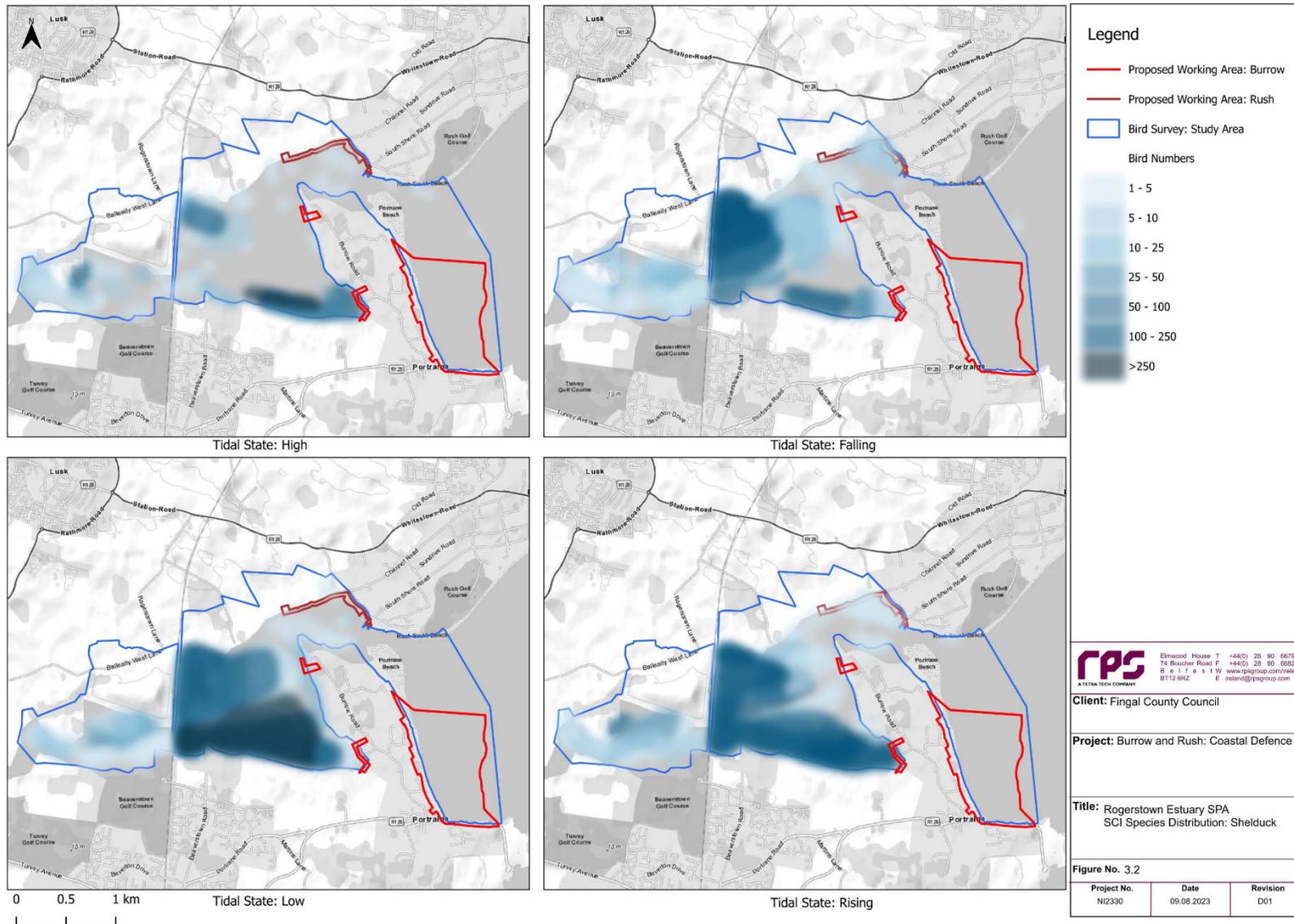


Figure 4.8 Wetland Bird Survey Results: Shelduck

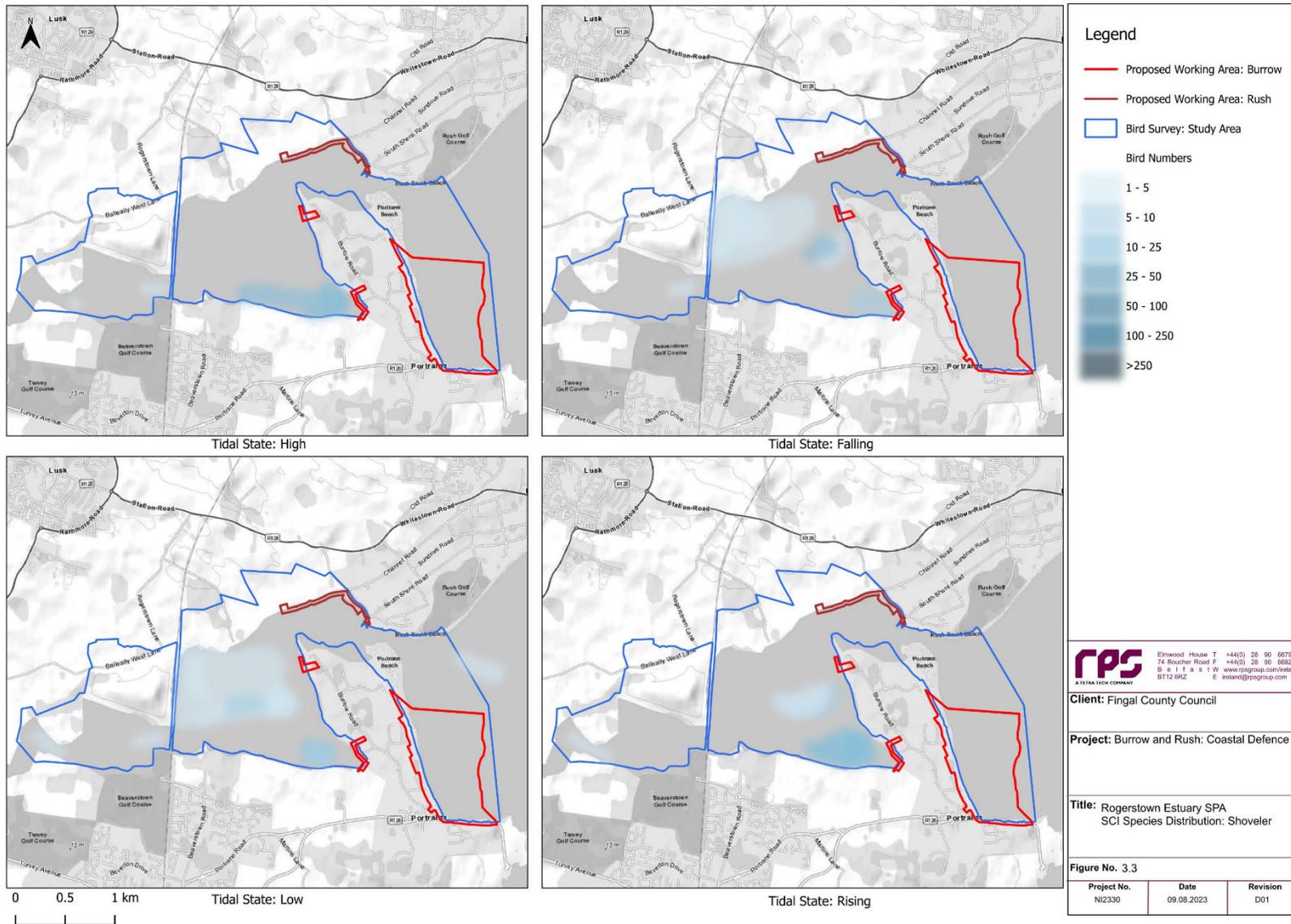


Figure 4.9 Wetland Bird Survey Results: Shoveler

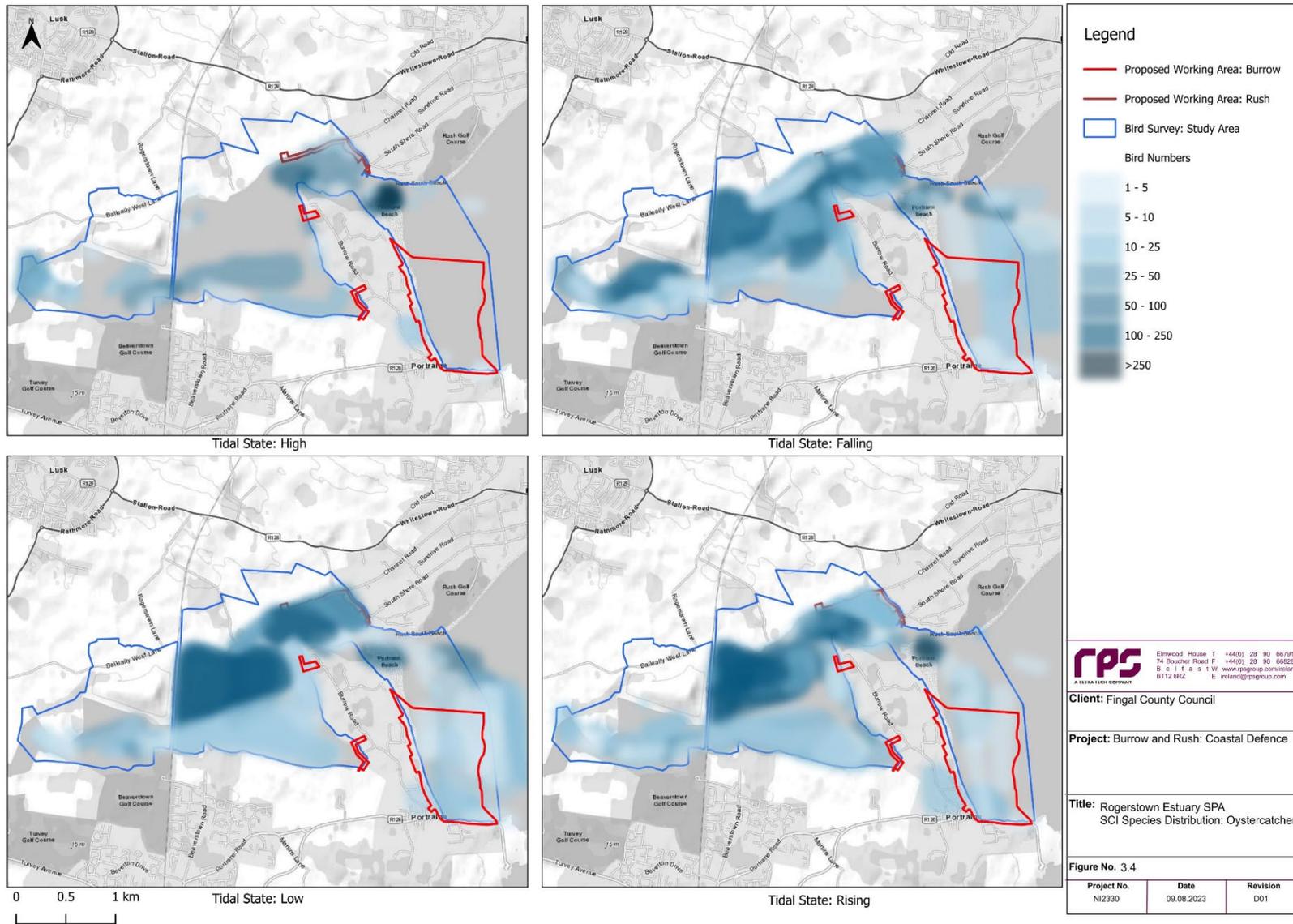


Figure 4.10 Wetland Bird Survey Results: Oystercatcher

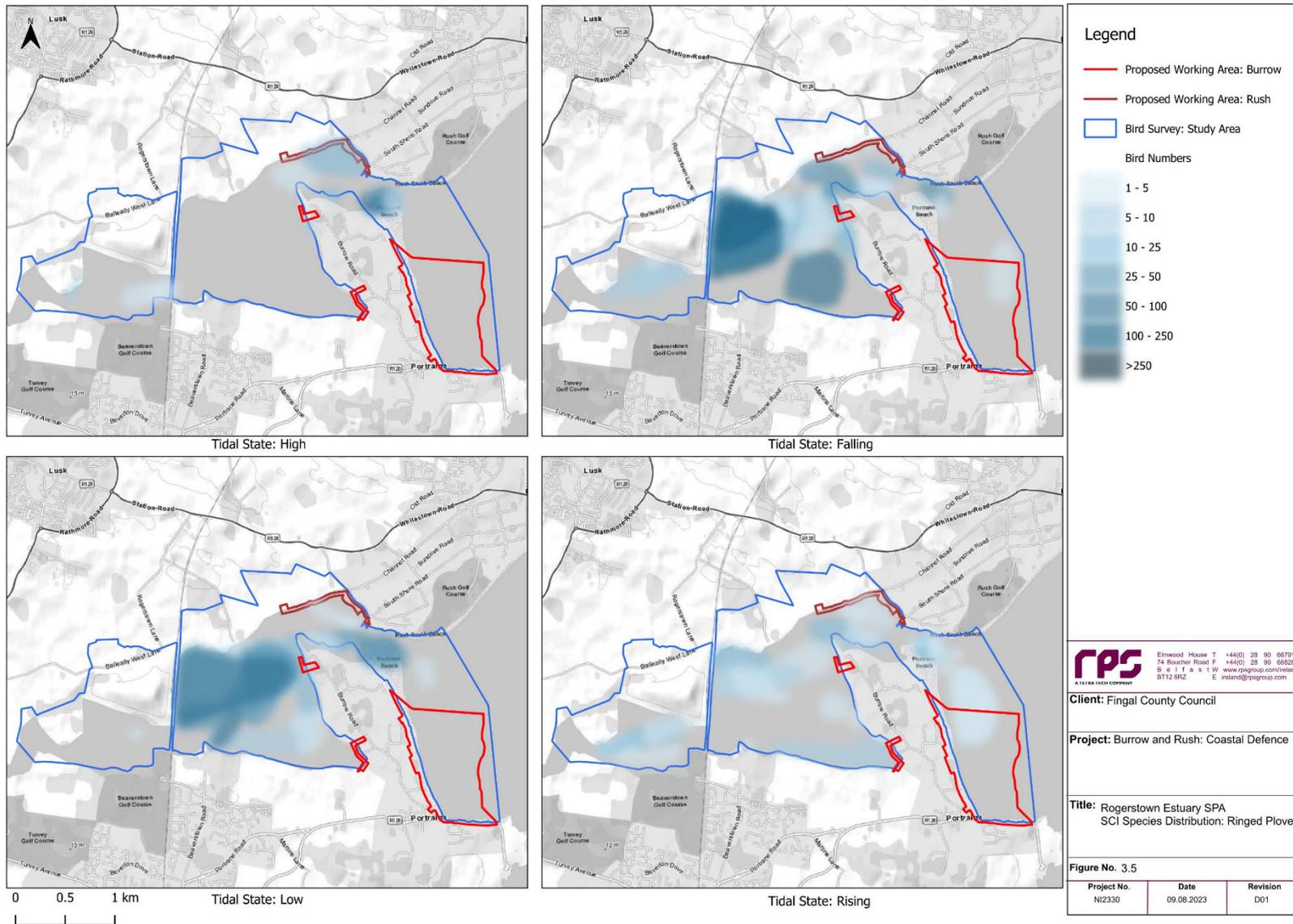


Figure 4.11 Wetland Bird Survey Results: Ringed Plover

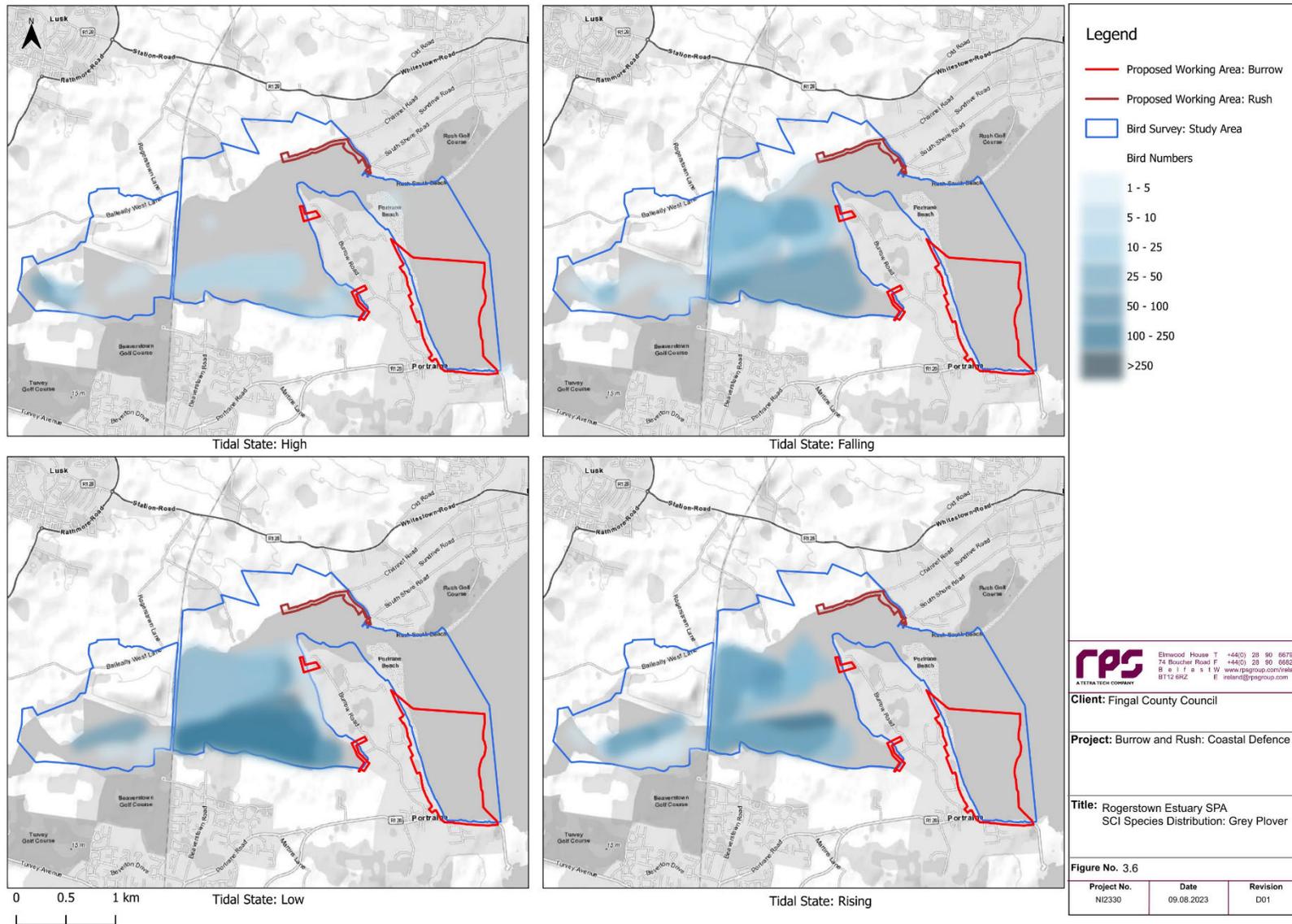


Figure 4.12 Wetland Bird Survey Results: Grey Plover

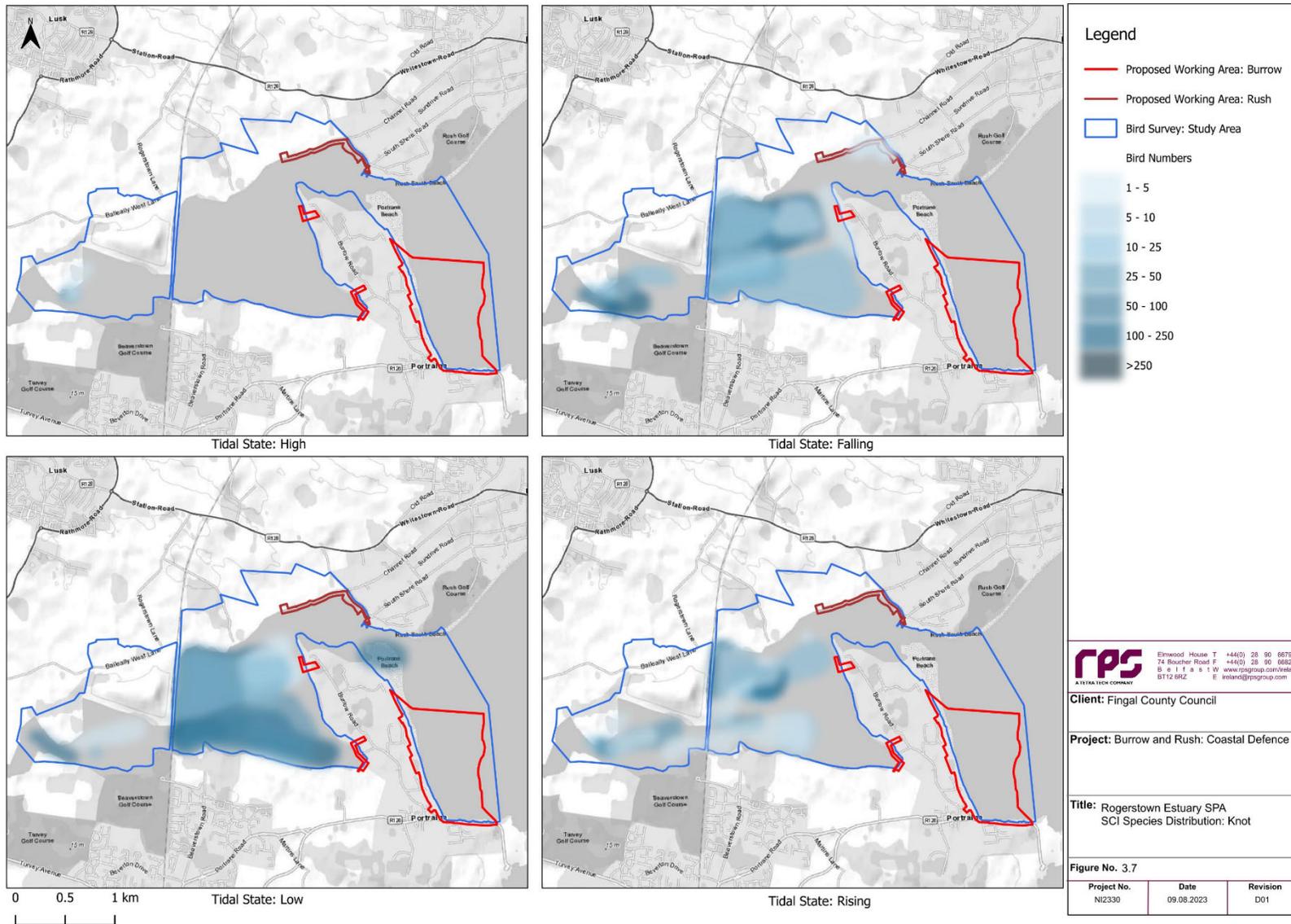


Figure 4.13 Wetland Bird Survey Results: Knot

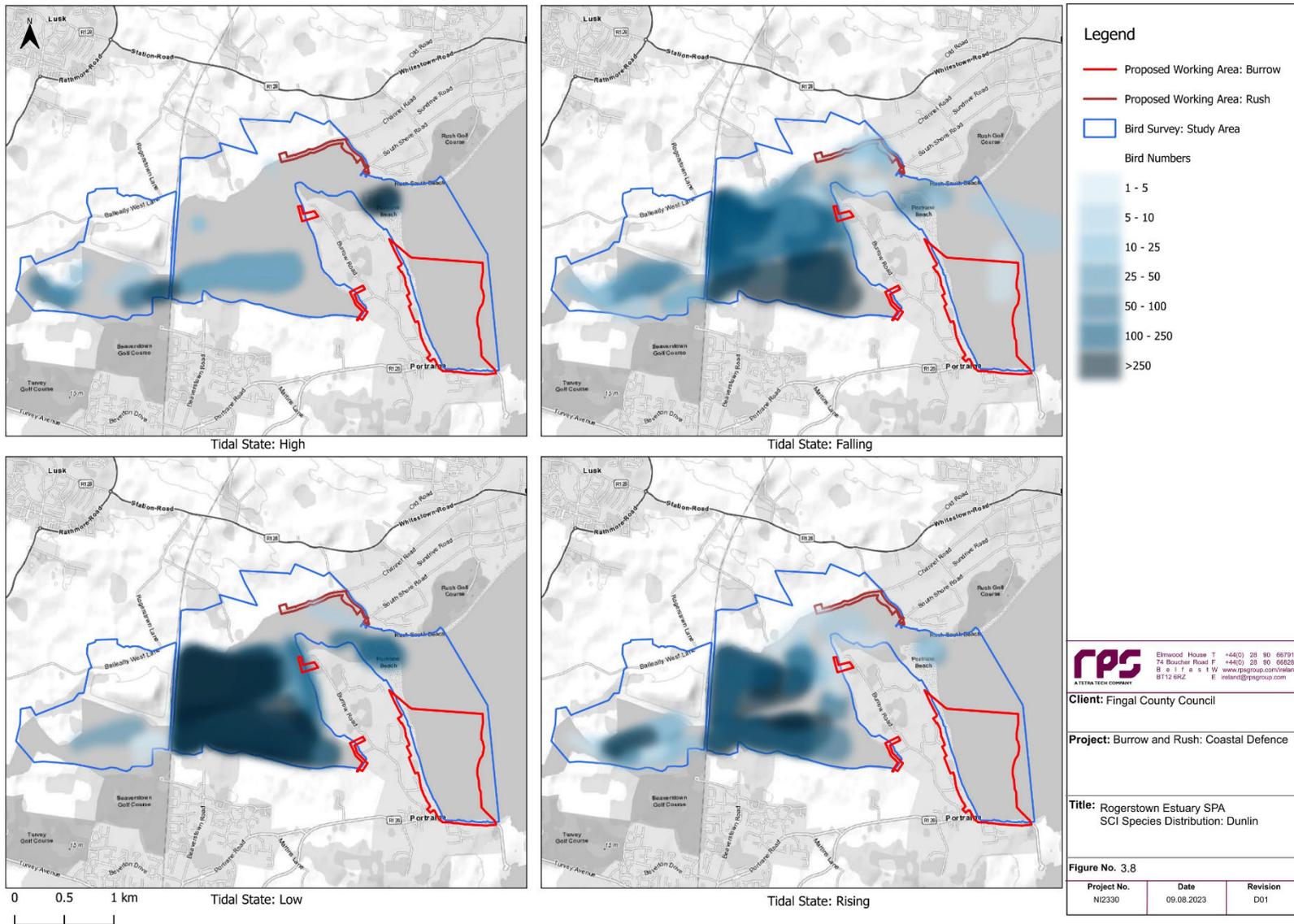


Figure 4.14 Wetland Bird Survey Results: Dunlin

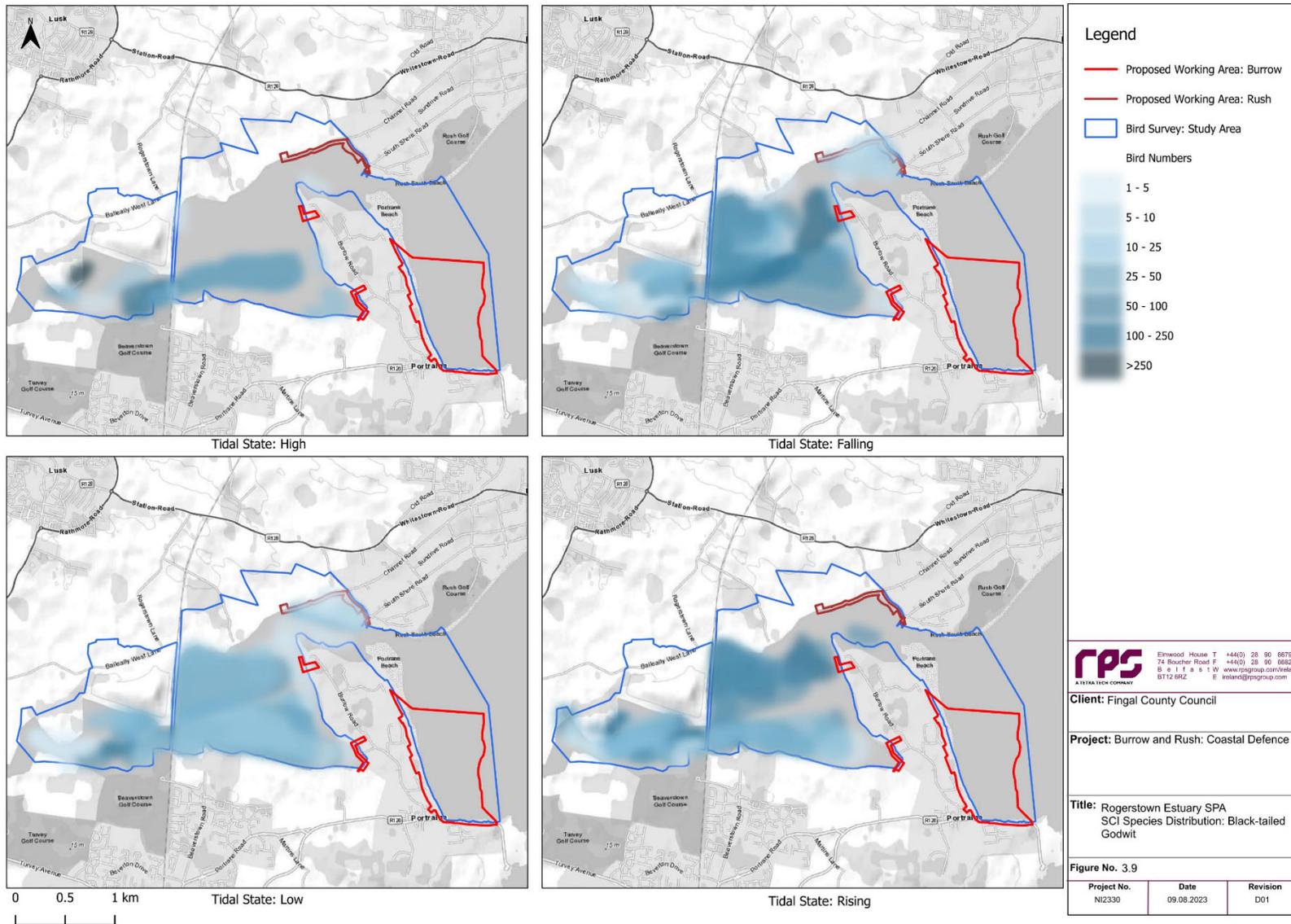


Figure 4.15 Wetland Bird Survey Results: Black-tailed Godwit

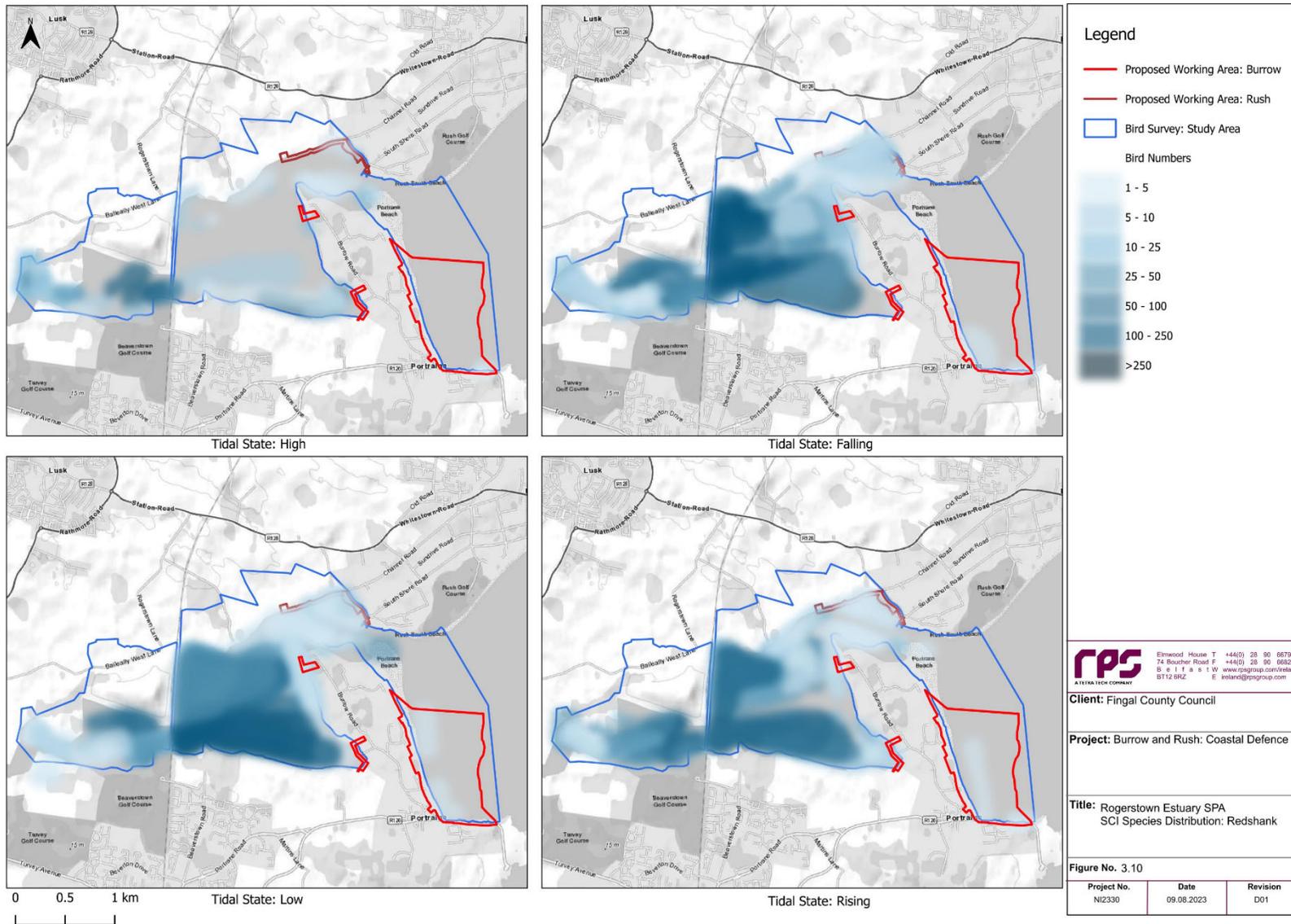


Figure 4.16 Wetland Bird Survey Results: Redshank

Table 4-5 Comparison of Bird Survey Results Within the Working Area, Study Area and Rogerstown Estuary SPA

SCI Bird Species	Mean no. recorded within the proposed working area (Winter 2021-2022)	Peak no. recorded within the proposed working area (Winter 2021-2022)	Mean no. recorded within the proposed study area (Winter 2021-2022)	Peak no. recorded within the proposed study area (Winter 2021-2022)	Baseline population reported across Rogerstown Estuary SPA within the original site selection documentation (NPWS 2013g)	Winter peak count reported across Rogerstown Estuary SPA within the last 5 years (I-Webs Birdwatch Ireland 2018-2023)	Winter peak count reported across Rogerstown Estuary SPA within the most recent Census data (I-Webs Birdwatch Ireland 2022-2023)
Greylag Goose <i>Anser anser</i> [A043]	0	0	0	0	160	2	0
Light-bellied brent goose <i>Branta bernicla hrota</i> [A046]	22.2	220	466.7	540	1069	6712	1950
Shelduck <i>Tadorna tadorna</i> [A048]	6.29	99	238.7	260	773	2286	735
Shoveler <i>Anas clypeata</i> [A056]	0	0	8.88	24	59	154	49
Oystercatcher <i>Haematopus ostralegus</i> [A130]	9.88	42	281.8	315	1345	2650	1832
Ringed plover	1	15	30.3	105	188	783	247

SCI Bird Species	Mean no. recorded within the proposed working area (Winter 2021-2022)	Peak no. recorded within the proposed working area (Winter 2021-2022)	Mean no. recorded within the proposed study area (Winter 2021-2022)	Peak no. recorded within the proposed study area (Winter 2021-2022)	Baseline population reported across Rogerstown Estuary SPA within the original site selection documentation (NPWS 2013g)	Winter peak count reported across Rogerstown Estuary SPA within the last 5 years (I-Webs Birdwatch Ireland 2018-2023)	Winter peak count reported across Rogerstown Estuary SPA within the most recent Census data (I-Webs Birdwatch Ireland 2022-2023)
<i>Charadrius hiaticula</i> [A137]							
Grey plover <i>Pluvialis squatarola</i> [A141]	0.08	2	34.3	101	229	653	399
Knot <i>Calidris canutus</i> [A143]	0	0	41.7	170	2454	4558	346
Dunlin <i>Calidris alpina</i> [A149]	8.6	205	537.5	1360	2745	9221	2815
Black-tailed godwit <i>Limosa limosa</i> [A156]	0.08	2	110.5	290	195	1813	663
Redshank <i>Tringa totanus</i> [A162]	4.71	26	220.2	248	490	3023	1147

The proposed development, as set out above, will give rise to the loss of habitats which are used by SCI bird populations associated with the SPA however areas to be permanently affected are minimal and were not recorded to be of high importance for SCI populations within the context of the wider SPA. It is noted that bird surveys undertaken in support of the proposed development recorded that the eastern shore of the Burrow experienced significant recreational disturbance to bird populations through the movement of human users and particularly dog walkers, which is likely to partially explain the relatively low numbers of birds recorded utilising these areas during the surveys.

As discussed above, aspects of the proposed project, namely the placement of groyne structures, will give rise to the permanent loss of areas of intertidal sand along the eastern shore of the Burrow inclusive of an area of around 1.36ha. Further temporary losses to such habitats will occur as a result of proposed beach renourishment works in addition to the movement of construction machinery to facilitate the groyne construction, affecting a total area of approximately 12.01ha.

As set out above, in respect of the Rogerstown Estuary SAC, it is anticipated that temporary habitat loss arising as a result of the proposed beach renourishment works and the movement of construction machinery will give rise to only relatively short-term impacts upon the supported infauna within these areas. Full recovery of species richness and abundance considered likely to occur within a minimum of two calendar years and significant recovery within six months.

On the basis of the above it is considered that temporary habitat loss effects, along the eastern shore of the Burrow, are not likely to give rise to any significant adverse effects upon overall intertidal foraging opportunities for waterbirds within the wider SPA. Significant alternative foraging resources will be retained throughout the estuary including areas recorded to be of relatively greater importance for the group.

The proposed works at Marsh Lane are predicted to give rise to only small-scale and temporary impacts to saltmarsh habitats to the west of the Burrow. These areas while recorded to support relatively greater numbers of foraging birds than those along the Burrow's eastern shore, still appear to be utilised by a relatively low number of birds (see Figure 4.7 - Figure 4.16) in the context of the wider SPA. Higher abundances were generally recorded to the west.

Proposed works to these areas will give rise to only very small-scale temporary habitat loss effects upon saltmarsh through the movement of construction machinery. As discussed, above these temporary effects may have potential to extend into the medium term in the absence of mitigation measures, through soil compaction and associated disruption to recolonisation.

Proposed works at Burrow Road will give rise to only small scale works within intertidal habitats, to facilitate the construction of the proposed flood embankment. As discussed above in respect of the extent and nature of adverse effects upon intertidal habitats arising along the eastern shore of the Burrow through the movement of construction machinery, it is anticipated that changes to intertidal habitats arising through vehicular movements are likely to be minor in comparison to natural sediment transport processes which occur through storm events and in the context of their temporary and short-term nature. Natural sediment transport is likely to occur closely following completion of the works giving rise to levelling of the substrate and replenishing uncompacted surface layers and associated recovery of infaunal communities (Schoeman et al. 2000).

It is nevertheless considered that the Proposed Development will give rise to an adverse effect upon the Rogerstown Estuary SPA as a result of small-scale habitat loss at construction stage.

## **4.2.2 Water Quality and Habitat Deterioration**

The Proposed Development, which will involve significant works within and in close proximity to areas of marine and intertidal habitat, will have potential to give rise to water quality and habitat deterioration effects upon aquatic habitats and associated species during the construction phase of the Proposed Development.

### 4.2.2.1 Rogerstown Estuary SAC

The Proposed Development will involve significant works within QI intertidal and marine habitats within the SAC involving the construction of groynes and associated beach renourishment works along the eastern shore of the Burrow, but also include works above MHWS, including construction of a proposed flood wall and embankment along and in proximity to Marsh Lane, the creation of a flood embankment at Burrow Road and

These works will give rise to the risk of pollution and sedimentation effects upon the aquatic environment arising through the use of construction equipment within and in proximity to marine and intertidal habitats, the use of concrete and other substrates in the construction of embankments and flood walls and the storage of such materials, petrochemical fuels and other potential pollutant substances within proximity to the proposed work areas. There is the potential for such pollution and sedimentation effects to undermine the conservation targets for the Annex I habitats of Rogerstown Estuary SAC if they cause habitat deterioration.

According to guidance on evidence-based sensitivity assessment, the benthic habitat receptors in and around the Proposed Development are considered to have biological sensitivities of low or not sensitive (Table 4-6 Sensitivity of benthic habitats to sedimentation.). This is further discussed within Chapter 12 of the accompanying EIAR.

**Table 4-6 Sensitivity of benthic habitats to sedimentation.**

Benthic habitat type (littoral sand)	Description	Sensitivity to heavy sedimentation
MA5-231	Barren Atlantic littoral coarse sand	Not sensitive
MA5-233	Amphipods and polychaete worm <i>Scolecopsis spp.</i> in Atlantic littoral medium-fine sand	Low
MA5-2332	Speckled sea louse <i>Eurydice pulchra</i> in Atlantic littoral mobile sand	Low
MA5-2412	Polychaetes and tellin shell <i>Angulus tenuis</i> in Atlantic littoral fine sand	Low
MA5-25	Polychaete/bivalve-dominated Atlantic littoral muddy sand	(not assessed)

The proposed beach renourishment process will involve the pumping of large quantities of sand “slurry” mixture to within the delivered groyne structures. As set out within the Coastal Processes Chapter of the accompanying EIAR (Chapter 6), these activities are predicted to give rise to sediment plumes within the adjacent marine and intertidal waters, arising largely from the initial pumping of this material while in suspension, prior to quick settlement on the shore or seabed. Due to the nature of the proposed pumping methodology sediment plumes will be largely limited excepting for 100 minutes every 16.5 hours of pumping over the 6-week beach renourishment works. During these periods suspended sediment concentrations (SSCs) of 85,000mg/l within the immediate vicinity of the discharge pipeline may occur. The concentration of the sediment plumes decreases to c.5,000mg/l within c.500m of the discharge points and to less than 5mg/l within c.700m of the discharge points. Importantly, at no point during these operations are background SSCs expected to increase by more than 2mg/l beyond the immediate vicinity of the foreshore area of the Burrow, including at Rush beach or within Rogerstown Estuary. During the remainder of the beach renourishment works SSCs are predicted to be considerably lower, with the average total SSC envelopes not generally predicted to extend for more than c.600m beyond the discharge locations and typically comprising SSCs less than 200mg/l within this area. The greatest average total SSCs of c.4,000mg/l are typically limited to within c.200m of the discharge

locations. The predicted sediment plume extents and concentrations, both maximum and mean, are illustrated at Figure 4.17 and Figure 4.18.

The estuarine environment within the Rogerstown Estuary SAC affected by the above suspended sediment inputs arising from the proposed works, is subject to significant natural sediment transport including outputs from the Rogerstown Estuary in addition to suspension, transport and deposition of existing marine sediments. These existing sediment transport regimes, which regularly create naturally high concentrations of suspended sediment within marine waters within and in proximity to the SAC, form the natural processes of the estuary and intertidal mudflat and sandflat system within the SAC.

As discussed above in respect of beach renourishment, the settlement or deposition of sediments, whether as a result of beach renourishment material deposition or resultant from suspended sediment plumes associated with such renourishment, has potential to result in altered surface substrates within areas of Annex I intertidal mud and sand. Such settlement of substrates from sediment plumes, which will occur outside of areas which are to be directly subject to beach renourishment, will be extremely minor when compared with that arising through the dry deposition of beach renourishment material at low tide. The maximum modelled SSCs for proposed beach renourishment, above 128,000mg/l, are limited to only the immediate vicinity of the proposed sinker pipeline discharge which as discussed above are to be subject to “dry” deposition and are relevant to temporary habitat loss effects, as discussed above. Higher but more typical levels of suspended sediment which will arise, around 1,000mg/l (1 g/l) are well within those recorded to arise within storm conditions within intertidal habitats which support similar substrates of up to 3g/l (Tang et al. 2019; Ogston and Sternberg 1999).

It is considered that as these modelled sediment concentrations will be largely within the ranges recorded for natural storm events, impacts associated with their settlement within areas of intertidal sand and mud and associated infauna will not be significant and will be subject to rapid recovery (Schlachter et al. 2012).

On the basis of the above information, it is considered that the effects of sediment plumes which may arise as a result of proposed beach nourishment works would not give rise to any significant adverse effects upon the habitat types comprising the Annex I habitat mudflats and sandflats not covered by seawater at low tide [1140]. On this basis it is further considered that any synchronous adverse effects upon the nearby Annex I habitat Estuaries [1130] would likewise not occur. No further potential impacts to any other QI Annex I habitats are predicted to arise as a result of proposed beach renourishment works as all other QI habitats are supratidal and as such only interact with marine waters on an infrequent basis.

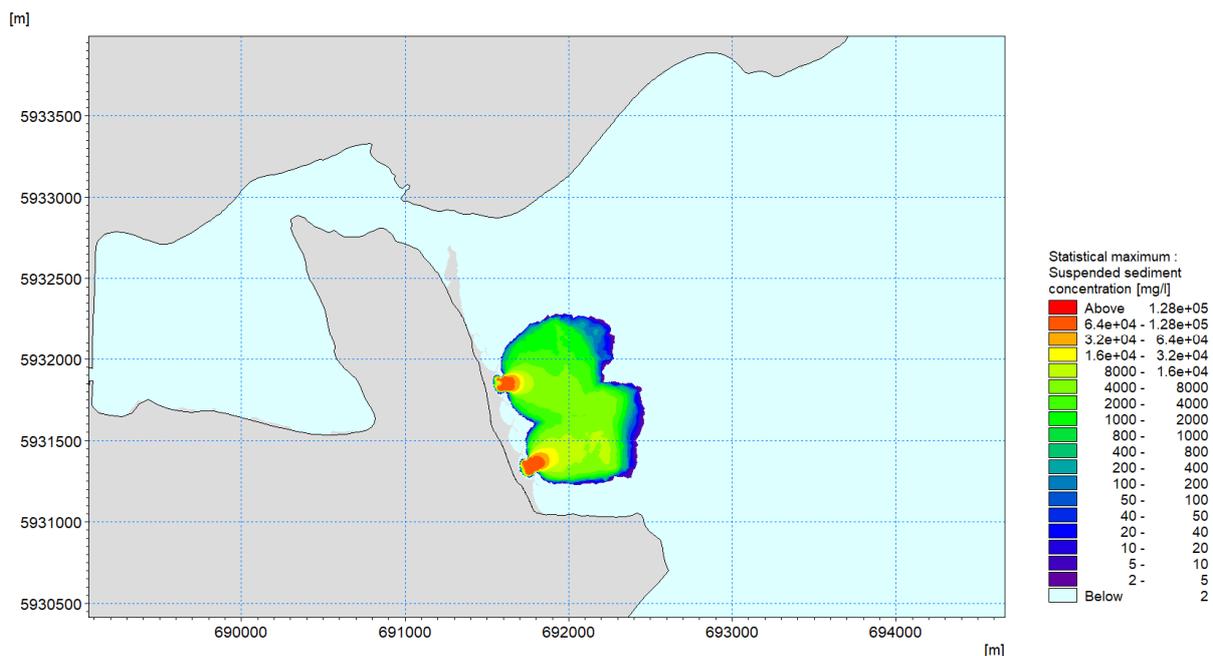


Figure 4.17 Maximum total suspended sediment concentration during the entire beach renourishment campaign

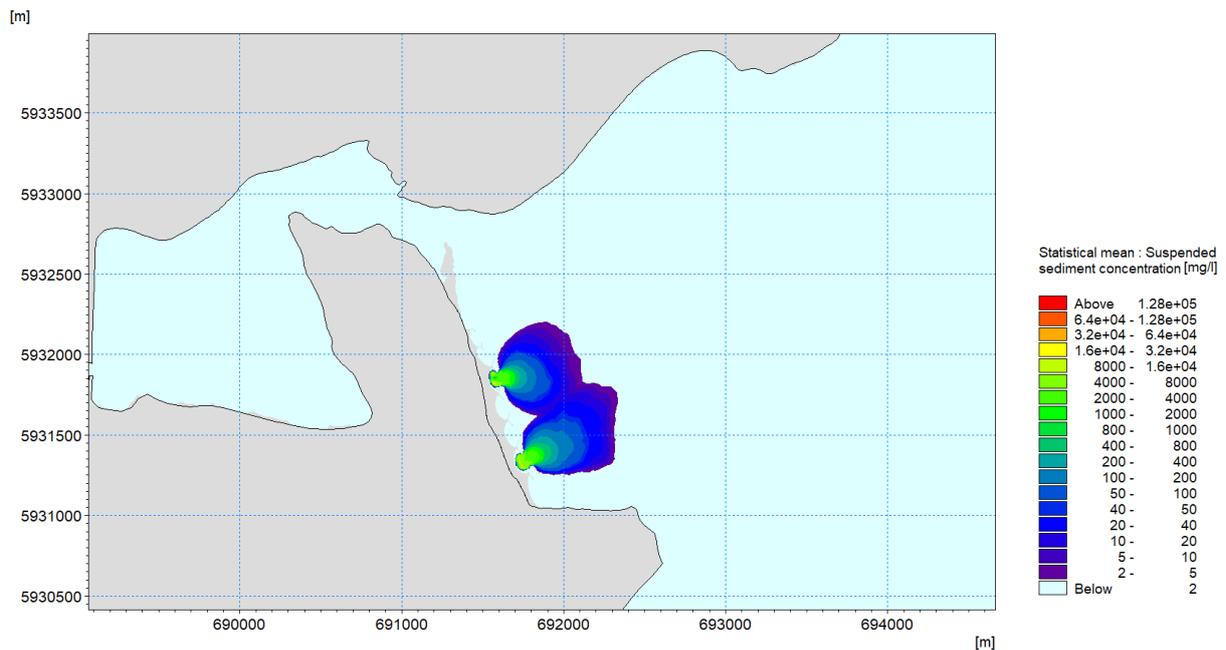


Figure 4.18 Mean total suspended sediment concentration during the entire beach renourishment campaign

The Proposed Development also has potential to give rise to pollution of marine and coastal habitats within the Rogerstown Estuary SAC through the release of petrochemical fuels, lubricants or construction materials including concrete and soil contaminants into the marine environment.

It is noted that any such potential pollution events involving petrochemicals or lubricants would be of relatively small-scale associated with the volumes contained within a small number of construction vehicles, operating in proximity to the intertidal or marine environment and any associated refuelling sources in addition to a single dredge vessel which will undertake beach renourishment works.

The accidental release of concrete or other construction materials into the marine or estuarine environment would be limited by the nature of the proposed works utilising such material in close proximity to the shore. The only area where it is predicted that the proposals will have potential to give rise to such effects is the proposed flood wall construction adjacent to Marsh Lane and embankment construction at the Burrow Road. Volumes of clay and other materials which are predicted to be required in respect of these works are fairly limited, with much of the work taking place at least 10m from the edge of the adjacent areas of intertidal habitat.

Furthermore, any spillage of such low volumes of material, in the case of both construction materials and liquid pollutants, into the marine environment would be subject to significant dilution within marine and estuarine waters which are subject to significant tidal mixing and as such it is highly likely that they would be reduced to background levels within close proximity to the location of the spillage.

On a precautionary basis it is assumed, despite the above information, that there may be a risk of adverse impacts upon QI Annex I habitats of the Rogerstown Estuary SAC from spillages of pollutants or contaminants, in the absence of mitigation.

The risk of adverse effects on the integrity of Rogerstown Estuary SAC as a result of water quality and habitat deterioration effects on its QI Annex I habitats cannot be excluded in the absence of pollution prevention mitigation.

#### 4.2.2.2 Rogerstown Estuary SPA

As set out above the Proposed Development will involve significant works within the boundary of the Rogerstown Estuary SPA, which largely shares a boundary which is concurrent with that of the Rogerstown Estuary SAC. These include the construction of a flood wall along Marsh Lane, the creation of a flood embankment at Burrow Road and the construction of groynes and associated beach renourishment along the eastern shore of the Burrow.

It is considered that the above rationale, set out in respect of the potential for proposed beach renourishment works to give rise to adverse effects associated with sediment plumes, for the Rogerstown Estuary SAC is also relevant in respect of the potential for the Proposed Development to impact upon wetland habitats within the Rogerstown Estuary SPA.

The modelling exercise conducted to establish the extent and nature of arising sediment plumes (see results at Figure 4.17 and Figure 4.18) has demonstrated that the proposals will give rise to only highly localised effects associated with elevated suspended sediment concentrations. As discussed above, in respect of potential habitat loss effects, benthic habitats within the range of these sediment plumes are known to have relatively low sensitivity to impacts associated with sedimentation and as such knock-on effects upon food availability for foraging SCI bird populations.

As discussed above in respect of the Rogerstown Estuary SAC, predicted SSCs except within extremely close proximity of the beach renourishment sinker pipeline location will be in line with those occurring within the intertidal environment as a result of storm conditions within these areas (Tang et al. 2019; Ogston and Sternberg 1999). As such it is considered that sedimentation impacts giving rise to significant decreases to food availability for foraging waterbirds associated with the Rogerstown Estuary SPA are unlikely to occur. Furthermore, all of the SCI bird species are known and have been recorded to principally forage within intertidal areas when the tide is out and are not known to utilise marine habitats for foraging.

On this basis it is not predicted that sediment plumes associated with the proposed beach renourishment works would have any potential to give rise to any adverse effects upon SCI bird populations or wetland habitats associated with the Rogerstown Estuary SPA.

It is well documented that oil spills, including that of crude oil and other hydrocarbons, can give rise to adverse impacts upon seabird populations. These adverse impacts result from impregnation of seabird plumage by hydrocarbon pollutants, floating on the sea surface, which reduces the ability of the feathers to provide waterproofing and insulation. Mortality subsequently occurs most commonly through hypothermia and starvation (Bourne 1968; Clark 1968; Hartung 1964; Jenssen 1994), but can also arise through suffocation, poisoning and dehydration.

These impacts occur to birds which physically come into contact with spilled hydrocarbons which float on the surface of marine waters in a film. In the case of crude oil and diesel spills, these surface films are heavier and less liable to quickly disperse, due to the presence of longer-chain hydrocarbons (Paulauskiene et al. 2014; Farzingohar et al. 2010). Other petroleum products produce lighter spills which disperse and breakdown more quickly. All these hydrocarbons are subject to dispersal and biodegradation within the marine environment and as such the potential oiling effects of such surface films on seabirds reduces with distance from the site of a spill (Farzingohar et al. 2010; Prince et al. 2013; Al Majed et al. 2012) and the extent of physical mixing, which accelerates breakdown.

Compared to the potential for spills which could arise from oil product tankers traversing the shipping lanes within the Irish Sea, the proposed works have a very limited potential to give rise to significant spillage of hydrocarbons onto the surface of the surrounding marine waters. Nonetheless, there remains a small risk of accidental hydrocarbon pollution events from the dredge vessel and terrestrial machinery working in the intertidal zone. Since this relates to accidental events it is clearly not possible to state what sort of fuel (and therefore how persistent it would be) or what volumes could be involved. However, it can be assumed that volumes associated with a spill from a single piece of machinery, would be relatively small, less than 1m<sup>3</sup>, representing the total of oil products required for a piece of terrestrial machinery with more moderate and higher volumes of fuels within the vessel itself (maximum of 500m<sup>3</sup>).

The fuels and oils to be utilised within the proposals are relatively light weight fuels or oils rather than of heavier oils, such as crude. Such oil or fuel spills would be subject to comparatively rapid evaporation, dispersal and biodegradation within the marine environment, and this would occur in close proximity to the site of any spill or leakage.

To consider the risk of likely significant effects on the remaining species, their vulnerability to oiling effects was investigated. Williams et al. (1995) produced an oiling vulnerability index (OVI) for all seabirds which are common within the North Sea and nearby areas (including those under consideration here). The OVI score for each species reflects a variety of factors including the species ecology (notably the time spent on the surface of the water and/or the need to dive into marine waters), their reliance on the marine environment, population recovery time and population size. Considering all these aspects, the OVI provides a ranked list of vulnerability (from high to low) for the species considered. Species with lower OVI scores are less vulnerable to the effects of oiling, while species with higher scores are more vulnerable to such effects. None of the SCI species of the Rogerstown Estuary SPA were included within the list of species assigned OVI scores. This is due to their non marine nature and as such the absence of vulnerability of such species to surface water oiling effects.

On the basis of the above information it is considered that the proposals have no potential to give rise to any significant adverse effects upon SCI bird populations of the Rogerstown Estuary SPA through surface water oiling effects.

As set out above however, it is not considered that there is sufficient certainty that other aspects of the Proposed Development including potential spillage of pollutants and construction materials would not, in the absence of mitigation measures, result in water quality and habitat deterioration effects upon SCI bird populations or wetland habitats associated with the Rogerstown Estuary SPA. The risk of adverse effects on the integrity of Rogerstown Estuary SPA as a result of water quality and habitat deterioration effects on its SCI bird populations and wetland habitat cannot therefore be excluded in the absence of pollution prevention mitigation.

#### **4.2.2.3 North-west Irish Sea SPA**

The Proposed Development will involve works within the marine environment in relative proximity of the North-West Irish Sea SPA with the site being separated from the closest point of the working area by 0.25km of marine waters.

The proposed works which will take place within the marine environment and separated from the SPA by 250m of marine waters are limited to the movement of the dredge vessel and associated sinker pipeline for beach renourishment works which will be temporary and will not give rise to any significant effects. It is further noted that any impacts to intertidal benthic communities through habitat loss or sedimentation, as discussed above in respect of the Rogerstown Estuary SPA, will not result in any adverse effects upon the SCI species of the North-west Irish Sea SPA. Such species, with the exception of the relevant gulls, are either pelagic or forage in open water only and primarily consume a diet of fish and as such are not directly vulnerable to effects on intertidal mud and sand.

As discussed above, proposed beach renourishment works will not give rise to any potential significant impacts associated with the arising sediment plumes within the wider area outside of the immediate location of material discharge. Given the spatial separation between the SPA and the proposed beach renourishment works it is not predicted that the Proposed Development would give rise to any significant sedimentation effects within the boundary of the SPA itself, as evidenced by the modelled dispersion rates. While some bird populations associated with the SPA may occur within the affected area, outside of the SPA boundary, it is noted that bird surveys undertaken in support of this assessment did not record these areas as regularly supporting significant numbers of SCI bird species associated with the cSPA. As such it is considered that adverse ex-situ effects upon SCI bird populations will not occur as a result of proposed beach renourishment works.

The proposals also have potential to give rise to adverse water quality and habitat deterioration effects in respect of the potential spillage of petrochemical fuels, lubricants and construction materials including soils and concrete.

It is noted that any such potential pollution events involving petrochemicals or lubricants would be of relatively small-scale associated with the volumes contained within a small number of construction vehicles, operating in proximity to the intertidal or marine environment and any associated refuelling sources in addition to a single dredge vessel which will undertake beach renourishment works.

The extent of adverse effects associated with the release of concrete and soils into the marine environment would be limited by the nature of the proposed works involving the use such material in close proximity to the shore. The only area where it is predicted that the proposals will have potential to give rise to such effects is the proposed flood wall construction adjacent to Marsh Lane and embankment construction at the Burrow Road. Volumes of clay and other materials which are predicted to be required in respect of these works are fairly limited, with much of the work taking place at least 10m from the edge of the adjacent areas of intertidal habitat. Given that such works will take place on the estuary side of the Burrow, and well separate from the SPA boundary it is considered that there will be no potential for significant adverse impacts upon SCI bird populations of the cSPA.

As discussed above in respect of the Rogerstown Estuary SPA, spillage of hydrocarbons can have potential to give rise surface water oiling effects to seabirds. Such effects which would potentially arise as a result of the proposed works are extremely minor, even in a worst-case scenario. Furthermore, any spillage of such low volumes of material, in the case of both construction materials and liquid pollutants, into the marine environment would be subject to significant dilution and dispersal within marine and estuarine waters which are subject to significant tidal mixing and as such it is highly likely that they would be reduced to background levels within close proximity to the location of the spillage and prior to their interaction with marine waters within the boundary of the cSPA (Lee et al. 2011).

On a precautionary basis it is assumed, despite the above information, that there may be a risk of adverse impacts upon SCI bird populations of the North-west Irish Sea SPA from spillages of pollutants or contaminants, in the absence of mitigation.

The risk of adverse effects on the integrity of North-west Irish Sea SPA as a result of water quality and habitat deterioration effects on its SCI birds cannot be excluded in the absence of pollution prevention mitigation.

#### **4.2.2.4 Rockabill to Dalkey Island SAC**

Rockabill to Dalkey Island SAC is located 2km from the boundary of the proposed working area at its closest point. This site is designated on account of the supported Annex I reef habitats and the populations of Annex II harbour porpoise.

Given the intervening 2km of marine waters it is considered that there would be no potential for the Proposed Development to result in any significant adverse water quality or habitat deterioration effects upon either QI feature of the SAC within the SAC boundary. This conclusion is drawn in light of the predicted levels of dilution which would occur within the intervening marine waters which have an enormous, combined volume and are subject to significant mixing associated with the flows of the wider Irish Sea.

Harbour porpoise, a highly mobile marine mammal, are known to occasionally utilise areas of marine habitat within proximity to the Proposed Development. Records returned from desk study with the National Biodiversity Data Centre (NBDC) include 13 records from within the bay between Rush and Portrane, the most recent of which being from 2020. No records are held by NBDC for the species from within the estuary itself.

While the species may be present within areas of marine habitat in close proximity to the Proposed Development, there is nothing to suggest that these areas are of particular value for the species and as discussed above, impacts within areas of known importance for the species will not occur. Given that the species does not utilise intertidal habitat it is considered that any potential release of pollutants or contaminants into the marine environment would likely be subject to significant dilution prior to interacting with waters in which the species is present. As the species is highly mobile it is considered

that any localised effects would not give rise to any significant adverse impacts on the favourable conservation status of the species within the SAC.

In the context of the species ecology and the small-scale potential effects arising as a result of the Proposed Development it is considered that the risk of adverse effects on the integrity of Rockabill to Dalkey Island SAC as a result of water quality and habitat deterioration effects on its QI harbour porpoise populations can be excluded in the absence of pollution prevention mitigation measures.

#### **4.2.2.5 Rockabill SPA**

The Rockabill SPA is designated on account of its supported breeding tern colonies and populations of non-breeding purple sandpiper. The SPA is located 7.5km from the proposed working area at its closest point however surveys undertaken in support of this assessment recorded those areas of marine habitat in close proximity to the working area, and to a lesser extent the working area itself, were utilised by tern populations which are likely to originate within or are otherwise associated with the Rockabill SPA.

Records of these species within the proposed working area during bird surveys undertaken to inform the assessment were limited to a single record of a flock of 50 common tern. Further records of common, arctic and roseate tern were focused on areas to the north of the proposed working area, which were comparatively heavily used by these species and inclusive of the areas where the Rogerstown Estuary discharges to the wider bay. No terns were recorded to forage within the areas in which the permanent infrastructure is proposed however it is acknowledged that this cannot be ruled out on an occasional basis as surveys undertaken are a representative sample of the use of the site by bird populations.

Table 4-7 Recorded Numbers of SCI tern species associated with the Rockabill SPA., below, sets out the numbers of SCI tern species likely associated with the Rockabill SPA, which were recorded during the bird surveys of the site within and in proximity to the Proposed Development and sets them against the populations of these birds which are present within the SPA and the recorded numbers as a percentage of these overall SPA populations. The numbers of the various tern species recorded within the surveyed area are illustrated at Figure 4.19 - Figure 4.21, which demonstrates their relative distribution across the surveys.

Table 4-7 Recorded Numbers of SCI tern species associated with the Rockabill SPA.

Species	Peak Number Recorded Within or in Proximity to the Proposed Working Area	Population of the Rockabill SPA (As per latest conservation objectives (NPWS 2013))	Population of the Rockabill SPA (As per latest Birdwatch Ireland (Annual Report 2022))	Recorded Numbers as a Percentage of SPA populations (Conservation objectives)
				(%)
				[Recorded Numbers as a percentage of SPA populations (Bird Watch Ireland 2022)]
				[%]
<b>Roseate Tern [A192]</b>	5	1207 Apparently Occupied Nests: Total population assumed to be 2414 birds.	1834 pairs. Total population assumed to be 3668 birds.	0.207 [0.136]
<b>Common Tern [A193]</b>	150	2031 Apparently Occupied Nests: Total population assumed to be 4062 Birds.	1503 pairs. Total population assumed to be 3006 birds.	3.69 [4.99]
<b>Arctic Tern [A194]</b>	4	165 Apparently Occupied Nests: Total population assumed to be 230 Birds.	49-60 pairs. Total population assumed to be 98-120 birds.	1.74 [4.082]

As discussed above in respect of the other relevant European sites, the proposed beach renourishment works, will give rise to extremely limited sediment plumes within relative proximity to the discharge locations. The mapped distribution of the arising sediment plumes, as shown at Figures 4.3 and 4.4 will not extend to within the areas which were recorded to be utilised by the above recorded populations of foraging terns, illustrated below at Figure 4.19 - Figure 4.21.

Williams et al. (1995) within their assessment of the relative vulnerabilities of seabirds to surface water oiling effects, as discussed above, listed common tern as having an OVI score of 20 and Arctic tern as having a score of 16, which are scores in the low-middle and bottom of the range respectively. As such these birds are vulnerable to such effects however as discussed above the magnitude of potential impacts is extremely small, in the absence of mitigation, and any inputs of relatively lighter (than crude) hydrocarbon fuels to the marine environment would be minimal. Furthermore dilution and dispersion effects are predicted to result in undetectable levels within close proximity to the works location.

Furthermore, as discussed above, the Proposed Development will have extremely limited potential to give rise to significant water quality and habitat deterioration effects associated with the accidental release of petrochemical fuels, lubricants or construction materials into the marine environment, with much of the works giving rise to such risks taking place on the estuary side of the Burrow. Any such limited potential inputs to the marine environment would be short-term in nature and would be subject to significant dilution within the marine waters of the Irish Sea which are subject to significant tidal mixing which would, it is considered, quickly dilute their concentration to background levels.

Given the small-scale impacts predicted to arise as a result of the Proposed Development, in addition to the known distribution of foraging tern populations associated with the Rockabill SPA within proximity to the site and the relatively low numbers of birds present within these areas in the context of the populations of the SPA, it is considered that significant adverse water quality and associated habitat deterioration effects upon the SCI bird populations of Rockabill SPA would not occur.

It is considered that the risk of adverse effects on the integrity of Rockabill SPA as a result of water quality and habitat deterioration effects on its SCI bird populations can be excluded in the absence of pollution prevention mitigation measures.

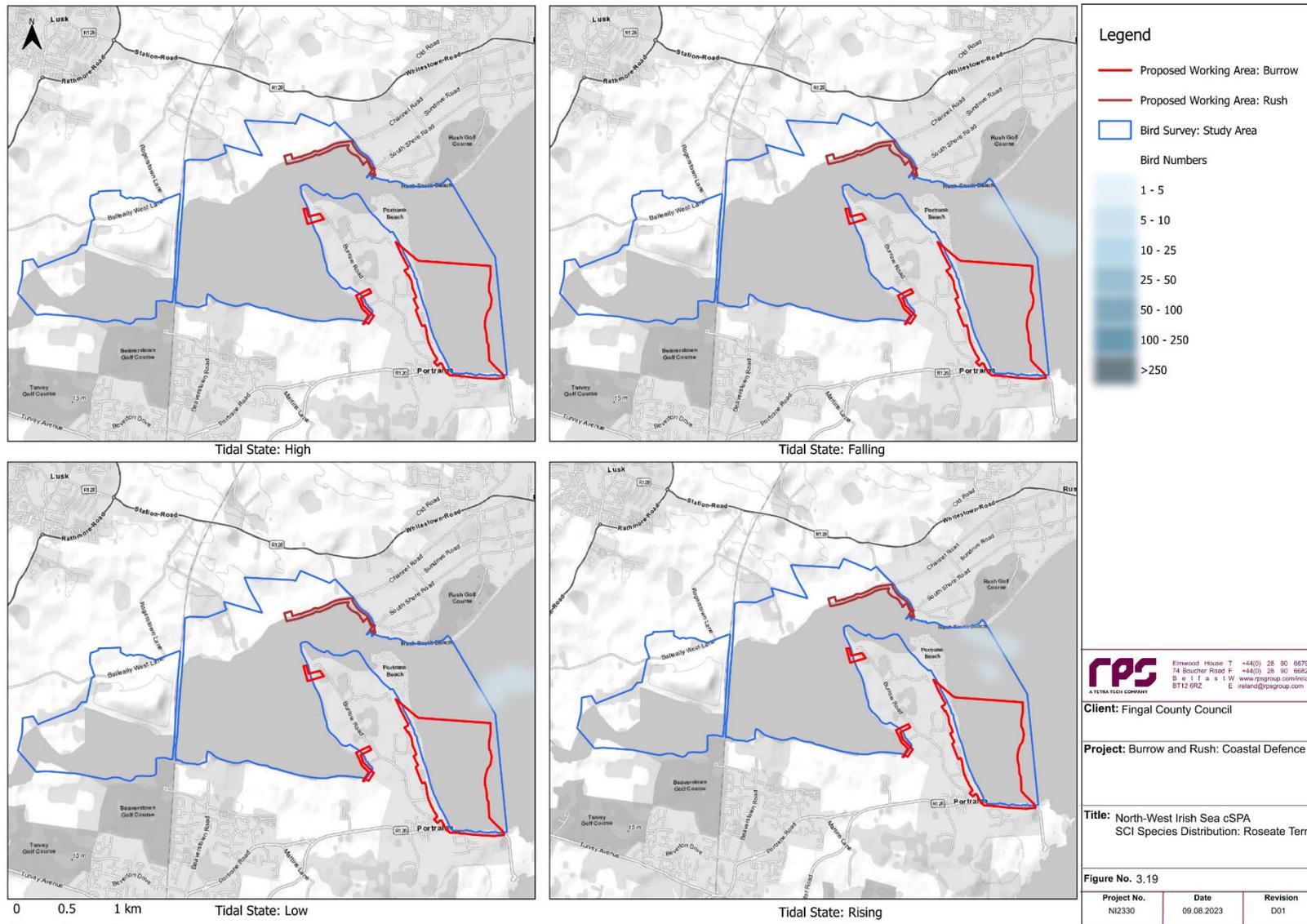


Figure 4.19 Recorded Roseate Tern Distribution During Bird Surveys undertaken to Inform the Assessment (RPS 2023)

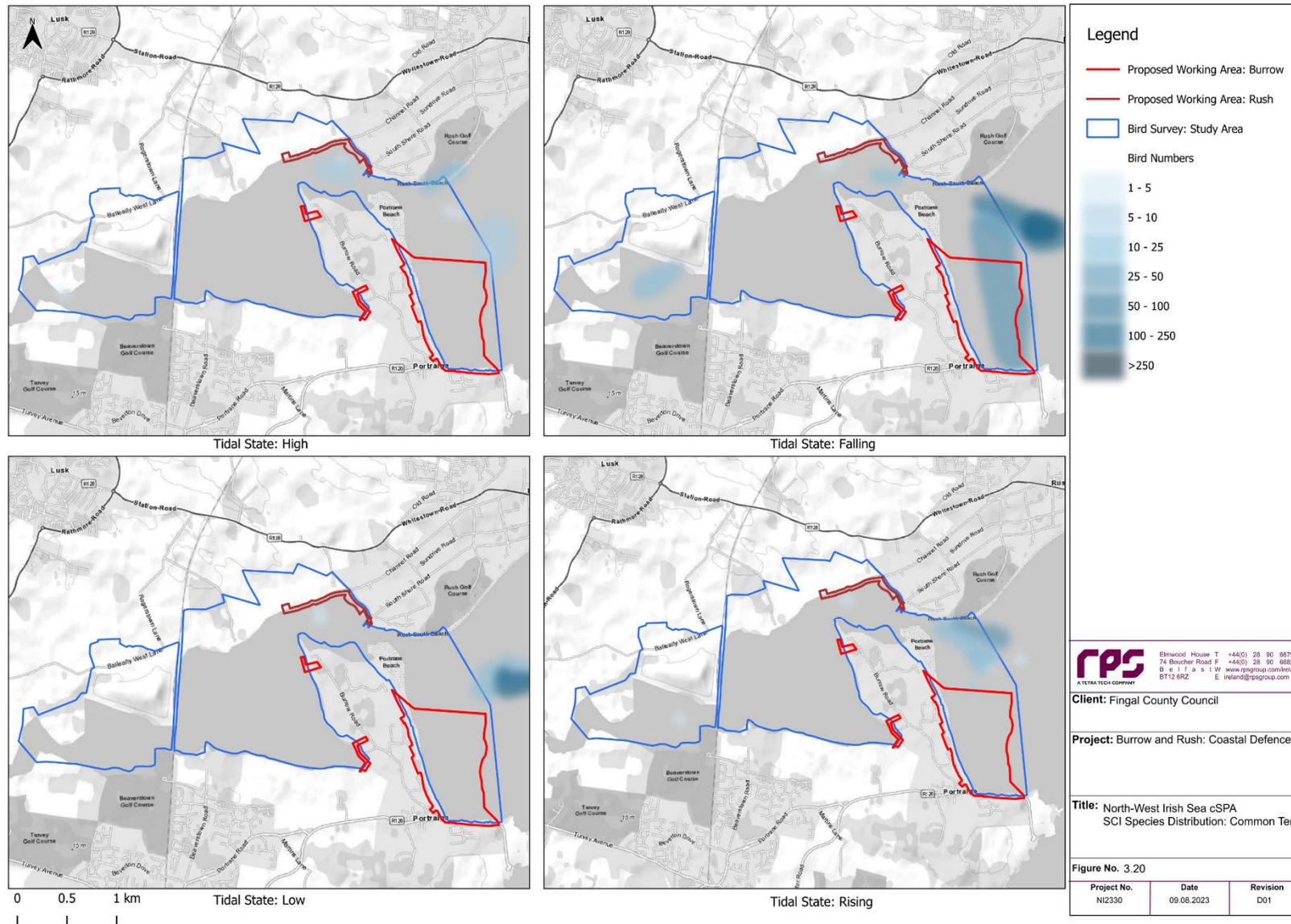


Figure 4.20 Recorded Common Tern Distribution During Bird Surveys undertaken to Inform the Assessment (RPS 2023)

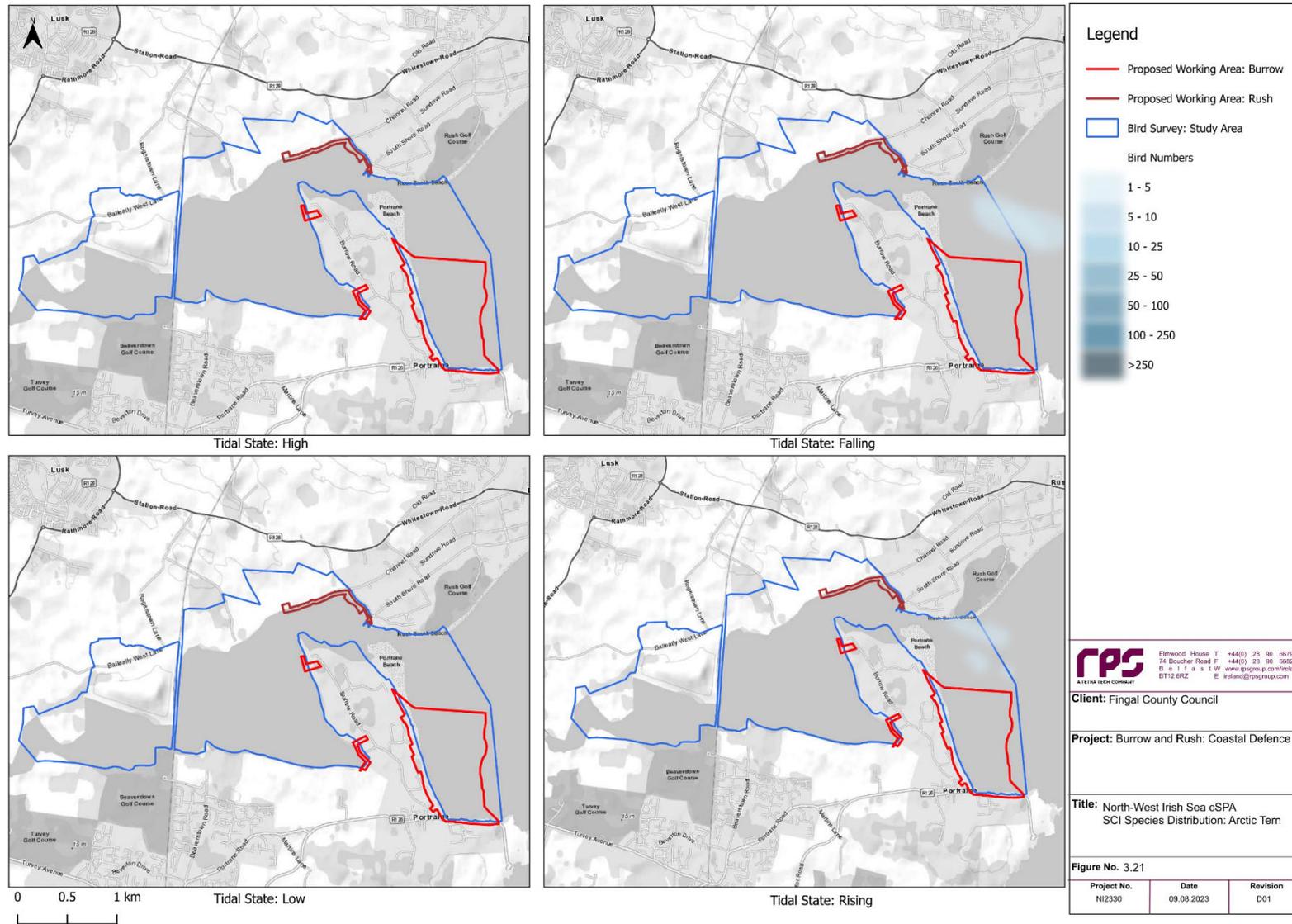


Figure 4.21 Recorded Arctic Tern Distribution During Bird Surveys undertaken to Inform the Assessment (RPS 2023)

### 4.2.3 Spread of Invasive Species

The Proposed Development will, at construction stage, involve works within areas of the estuary, in proximity to Marsh Lane, which are known to support cord-grass *Spartina sp.* which is a scheduled non-native invasive species. As such these aspects of the proposed works have potential to give rise to the inadvertent spread of this invasive species within European sites in close proximity to the Proposed Development. Given that the species is only found on areas of intertidal mud and that the Proposed Development would only have potential to give rise to the localised spread of the plant it is considered that potential impacts would only occur to the Rogerstown Estuary SAC and Rogerstown Estuary SPA.

#### 4.2.3.1 Rogerstown Estuary SAC

The construction phase of the Proposed Development will involve works within close proximity to areas of the invasive species common cord-grass *Spartina anglica*. This species, present within tidal mud in the central western areas of the site, see Figure 4.22, is a non-native invasive species included within the third schedule of the European Communities (Birds and Natural Habitats) Regulations 2011. The Proposed Development, at construction stage, has potential to give rise to the limited spread of this species associated with construction works proposed within areas currently occupied by the plant.

Common cord-grass is included as a negative indicator species within the conservation objectives for the Annex I habitats Salicornia mud (1310), Atlantic saltmarsh (1330) and Mediterranean saltmarsh (1410) within the SAC, which state that there should be no significant expansion of the species distribution beyond 1% annual growth in locations where it is already known to occur. The further spread of this species within the SAC, including to areas of Annex I saltmarsh habitats would have potential to give rise to adverse impacts to these qualifying features through competition with existing floral communities and subsequent impacts to sediment deposition rates within areas of saltmarsh.

It is considered that the risk of adverse effects on the integrity of Rogerstown Estuary SAC as a result of effects associated with the spread of invasive species to its QI Annex I habitats cannot be excluded in the absence of preventative mitigation measures.

#### 4.2.3.2 Rogerstown Estuary SPA

As set out above in respect of the SAC, the construction phase of the Proposed Development will involve works within close proximity to areas of the invasive species common cord-grass *Spartina anglica* and has potential to give rise to the limited spread of this species associated with construction works proposed within areas currently occupied by the plant. This includes areas of intertidal wetland within the SPA boundary for which it is designated and of importance for populations of wintering SCI birds.

The spread of *Spartina anglica* is known to give rise to a decrease in the suitability of intertidal mud for foraging waders and waterfowl through displacement of native vegetation and through altering the physical structure of the intertidal habitat including through obstructing clear sightlines which feeding waders prefer in order to minimise risk of predation (Davis & Moss 1984, Goss-Custard & Moser 1988, Doody 1990). Spread of the species would therefore infringe on the achievement of the conservation objectives for each SCI bird species.

It is considered that the risk of adverse effects on the integrity of Rogerstown Estuary SPA as a result of water quality and habitat deterioration effects on its SCI bird populations and wetland habitats cannot be excluded in the absence of preventative mitigation measures.

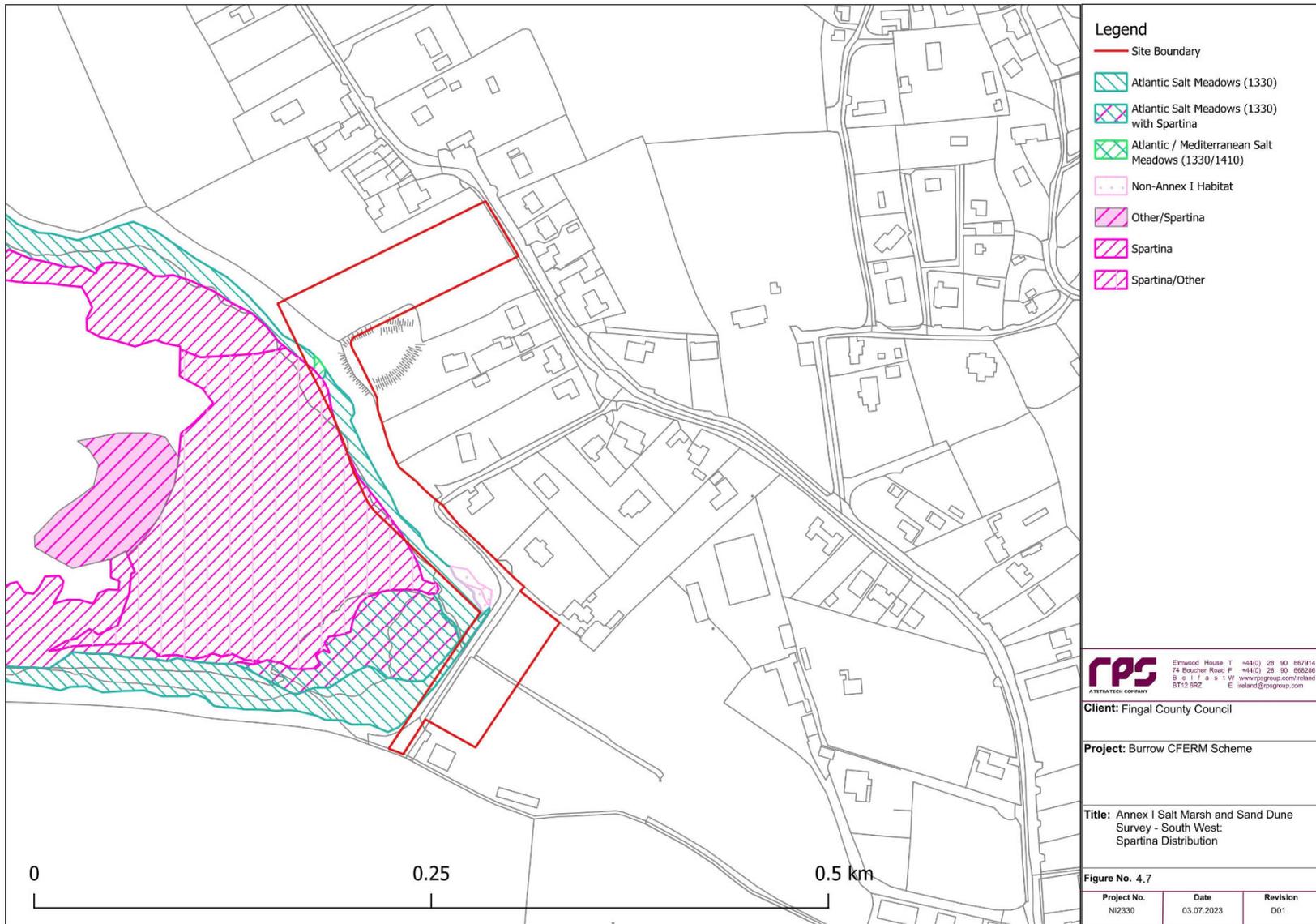


Figure 4.22 Spartina Distribution within the Proposed Working Area

## 4.2.4 Underwater Noise and Vibrational Disturbance

As described in Section 3, the aspects of the Proposed Development requiring activities with potential to produce significant underwater noise, are limited to sheet piling to construct the proposed flood wall in proximity to Marsh Lane. All other aspects of the Proposed Development including the construction of proposed groyne structures will, it is considered, give rise to underwater noise levels which are entirely in-keeping with ongoing levels of underwater noise and vibrational disturbance which occur within marine habitats in proximity to the site.

Underwater noise is not a persistent effect, and once the noise source ceases noise levels drop very quickly to pre-existing levels. The natural underwater soundscape of the Rogerstown Estuary and adjacent areas of Irish Sea is not silent - biological sounds from fish and marine mammals are mixed with sounds from waves and surface noise; current flow and turbulence; rain and wind/storm noise; and noise from shipping and leisure craft activities. The ambient noise levels in coastal and inshore water, bays and harbours are subject to huge variation.

Proposed activities carry a very small inherent risk of noise induced effects upon some marine species as a result of underwater acoustic energy being released into the marine environment.

### 4.2.4.1 Rockabill to Dalkey Island SAC

While the Proposed Development may give rise to underwater noise and vibrational effects associated with the installation of sheet piled flood walls in proximity to the estuary, it is considered that intervening bedrock, mud and other overburden would give rise to significant attenuation of such effects.

Populations of harbour porpoise for which the Rockabill to Dalkey Island SAC is designated are known to occur throughout the SAC. Harbour porpoise are also likely to be present within marine habitat in close proximity to the proposals, including within the estuary and close to the western shore of the Burrow on at least an occasional basis. Records of harbour porpoise held by NBDC include 13 records from within the bay between Rush and Portrane, the most recent of which being from 2020. No records are held by NBDC for the species from within the estuary itself.

Harbour Porpoise use sound for foraging, navigation, social activities and predator detection. Changes in underwater noise therefore have the potential to interrupt these behaviours. The peak frequency of echolocation pulses produced by Harbour Porpoise is 120–130 kHz, corresponding to their peak hearing sensitivity although hearing occurs throughout the range of ~1 and 180kHz (Southall *et al* 2007). A range of activities emit sound that falls within the hearing sensitivities of porpoise, including shipping, pile driving, Acoustic Deterrent Devices (ADDs) and military activities. The exact frequency, intensity and longevity of the sound will determine the response. The impact on the porpoise is also mediated through individual behaviour, and perhaps quality of its immediate habitat, at the time of exposure.

In order to characterise the potential effects of construction noise, the magnitude of the effect and the sensitivity of the receptors determines the overall impact. Table 4-8 summarises the sensitivities of marine mammal species with regard to noise thresholds. A permanent threshold shift (PTS) occurs when a permanent auditory injury results in loss of hearing. PTS can result in very significant to profound negative impacts on marine species. A temporary threshold shift (TTS) describes a temporary but recoverable loss of hearing due to exposure to high energy sounds for a short duration or lower energy sounds for a longer duration. The impact of TTS is significant but recoverable. Determining the likelihood of noise sensitive species being exposed to such noise levels will help to categorise the significance of effects on each species. The international guidance on underwater noise threshold levels for marine mammals is published in Southall *et al* (2019) and provides (*inter alia*) the following thresholds (Table 4-8).

Table 4-8 TTS- and PTS-onset thresholds for marine mammals exposed to non-impulsive noise

Marine mammal hearing group	TTS onset: SEL (weighted)	PTS onset: SEL (weighted)
	dB re 1 $\mu$ Pa <sub>2s</sub>	dB re 1 $\mu$ Pa <sub>2s</sub>
Low Frequency Cetaceans (baleen whales)	179	199
High Frequency Cetaceans (most dolphin species)	178	198
Very High Frequency Cetaceans (Harbour Porpoise)	153	173
Phocid Carnivores (seal species)	181	201
Other Carnivores (otters)	199	219

The onset of auditory injury in marine mammals, defined as a Permanent Threshold Shift (PTS) occurs at different received noise levels, dependent on the hearing ability of the marine mammals. Furthermore, it is considered likely that localised increases to the levels of underwater noise are more likely to result in displacement of the individuals within proximity to the works prior to auditory injury. As such it is considered that a number of circumstances would have to occur concurrently for auditory injury effects to harbour porpoise to arise. Firstly, the proposed sheet piling operations would have to give rise to underwater noise levels sufficient to cause PTS (greater than 173 DB), secondly this noise level would have to arise suddenly and without prior warning otherwise individuals are likely to vacate the area in which impacts would occur, thirdly harbour porpoise would need to be present within the area in which impacts would occur i.e. in close proximity to the works.

Detailed assessment of the noise levels arising as a result of the proposed sheet piling works is not possible given the variable nature of the substrates and intervening overburden and soils. In the absence of such an assessment it is assumed, on a precautionary basis, that the noise levels would be sufficient to result in auditory injury to harbour porpoise present within close proximity to the proposed works. It is noted however that proposed piling operations will utilise a vibratory piling technique which will minimise such potential effects relative to percussive pile driving methods. In considering this, in addition to the attenuating effects of the intervening substrates as all works will occur during dry conditions, it is considered fairly unlikely that generated noise levels would exceed the thresholds for PTS in harbour porpoise.

Likewise, the use of dredge vessels (trailer suction hopper dredger) for proposed beach renourishment works, the exact specification of which is not currently known, will give rise to underwater noise. Previous studies into the use of dredge vessels during extraction pumping operations, which are likely to be similar to those arising through pumping of said material to the renourishment areas, have recorded pumping during extraction to give rise to underwater noise levels of up to 143 to 144 dB re. 1  $\mu$ Pa<sub>2</sub> at distances 250m from the source (Robinson et al. 2011). This study concluded that source Levels at frequencies below 500 Hz are generally in line with those expected for a cargo ship travelling at modest speed. A similar study (Theobald et al. 2010) recorded peak sound pressure levels of less than 144 dB re. 1  $\mu$ Pa<sub>2</sub> at distances of 100m from the source location. A study of dredging and pump out operations of dredged material for beach nourishment works by a vessel similar in nature to that proposed in respect of the development (Reine et al. 2014) recorded peak sound pressure levels of less than 145 dB re. 1  $\mu$ Pa<sub>2</sub> at distances of less than 50m from the vessel. These sound pressure levels were relatively consistent with those arising as a result of the movement of the vessel between the extraction and pumping out sites. In all such studies the peak noise levels were recorded to significantly decrease at distance from the studied vessel.

While it is noted that the above referenced studies were undertaken in conditions which may not exactly align with those supported within the proposed working area, it is considered highly unlikely that the use of such a vessel will generate noise levels which would exceed the thresholds for PTS in harbour porpoise.

Proposed vibrational piling has potential to start rapidly and as such give rise to sudden underwater noise and vibrational effects in the absence of mitigation measures.

Given the known distribution of harbour porpoise within the Rockabill to Dalkey Island SAC, in addition to records held for the species within proximity to the proposed works it is considered that the species may be present within areas to be affected on a very infrequent basis. It is also considered that given the highly tidal nature of the estuary, the use of these areas by the species is likely to coincide with high tide as access to the estuary is fairly limited during low tide events. The presence of harbour porpoise in proximity to the proposed works is therefore not ruled out on a precautionary basis.

Proposed piling is to take place within during dry conditions, outside of high tide events which would give rise to inundation of areas of estuary in close proximity to the proposed works location. As such, significant overburden including mud and sandflats will be present during the proposed works, between the proposed piling works and the marine environment which will be significantly separated from the works. On this basis it is not anticipated that the proposed piling works will have potential to give rise to any significant risk of auditory injury or other underwater noise or disturbance effects upon harbour porpoise, which are also unlikely to be present within the estuary.

It is considered that the Proposed Development has no potential to give rise to likely significant adverse impacts to harbour porpoise populations of the Rockabill to Dalkey Island SAC through underwater noise and vibrational disturbance.

Adverse effects upon QI harbour porpoise populations associated with the Rockabill to Dalkey Island SAC as a result of underwater noise and vibrational effects therefore can be excluded in the absence of mitigation measures. It is considered that this conclusion is relevant for all other European sites which are designated on account of the supported marine mammal species and located at greater distances from the project.

#### **4.2.4.2 Lambay Island SAC**

Populations of grey seal supported within Lambay Island SAC have some limited potential to be disturbed as a result of underwater noise associated with vessel movements and associated pumping of dredged material required to facilitate the proposed beach renourishment works.

The conservation objectives for this SAC list human disturbance and its limitation as an attribute and target for grey and harbour seal. Discussion of this within the associated Conservation Objectives Supporting Document sets out that sources of such human disturbance include underwater and aerial noise.

Records of grey seal and harbour seal held by NBDC include two records of grey seal (the most recent of which was from 2012 and a single record of harbour sea from 2019). Records were from within the bay between Rush and Portrane, no records are held by NBDC for the species from within the estuary itself. Areas within proximity to the proposed works are not known to support haul out sites for breeding seals. Bird surveys undertaken to inform the assessment, as discussed above, did not record the presence of any seals during the surveys.

Lambay Island SAC, which is partially designated on account of the supported breeding populations of grey and harbour seal, is situated 4.2km from the closest point of the proposed working area. While the exact specification of the trailer suction hopper dredger vessel, to be used for proposed beach renourishment works is yet to be finalised, it is anticipated that the vessel will produce noise levels which are in line with those arising through the use of typical medium-sized vessels which occur throughout the Irish Sea. It is not considered that the proposed works would have any potential to give rise to any measurable increase in noise levels within the SAC boundary given the intervening expanse of marine habitat over which any aerial or underwater noise effects will attenuate.

It is considered likely that grey seals which originate within or are otherwise associated with the SAC, may be present on an occasional basis in the area proposed for works given the known foraging ranges around known haul out sites for these species which are up to 100km for grey seal (Cronin et al. 2013) and 50km for harbour seal (Thompson et al. 1998).

Grey seals have been recorded as largely tolerant to underwater noise (J. Parsons in G.D. Green et al. 1985) with pinnipeds generally being resilient to the effects of regular high intensity underwater noise with localised avoidance recorded in association with underwater noise of up to and greater than 190dB (Harris et al. 2001). Both grey and harbour seals are known to frequent areas which are subject to relatively high levels of anthropogenic disturbance including busy ports (Brooks et al. 2016), marinas (Bankhead et al. 2023) and offshore wind farms (Russell et al. 2016).

As set out at Table 4-8, pinnipeds including grey and harbour seal are subject to much higher noise thresholds for auditory injury than any other marine mammals with the exception of otter.

On the basis of the above information and in the context of the apparent relatively low importance of the working area for both grey and harbour seals, the temporary nature of the proposals and the relatively limited nature of the proposed works to give rise to excessive underwater noise and vibrational effects, as discussed above, it is considered that the Proposed Development will not give rise to any significant adverse effects upon QI grey seal or harbour seal populations of the Lambay Island SAC. Such effects can therefore be excluded in the absence of mitigation measures.

## 4.2.5 Aerial Noise and Visual Disturbance

As described in Section 3, some aspects of the Proposed Development will require activities in the marine environment including activities producing aerial noise and visual disturbance including the movement of plant and construction operatives to construct the proposed flood wall in proximity to Marsh Lane and the construction of proposed groyne structures and the movement and use of a dredge vessel within the marine environment to the east of the Burrow.

These activities carry a potential risk of giving rise to disturbance and displacement effects upon sensitive qualifying interests of nearby European Sites.

### 4.2.5.1 Rogerstown Estuary SPA

Surveys undertaken to inform this assessment have shown that areas of the Rogerstown Estuary SPA within and within close proximity to the proposed working area, are of importance to wintering SCI bird populations in variable but relatively high numbers including significant proportions of the SPA populations.

The recorded distribution of the various SCI bird species, as discussed above is set out within the Bird Survey Report (RPS 2023) which accompanies the EIAR which has been submitted alongside this NIS (Appendix 13.C). This data is represented above at Table 4-5 and illustrated in Figure 4.7 - Figure 4.16. As summarised above the proposed working areas and adjacent areas of intertidal wetlands were recorded to support populations of wintering SCI bird species associated with the Rogerstown Estuary SPA, including significant proportions of the SPA populations of these species. It is noted however that areas to the east of the Burrow were of comparatively lower importance for a large number of the SCI species. It is also noted that no areas of the SPA within or in close proximity to the proposed works were relied upon by any SCI species exclusively during any particular tidal state. Other areas of suitable habitat, at any given tidal state and throughout the wintering period are available for each of the SCI species within the wider SPA.

It is considered that the Proposed Development which will involve the movement of construction vehicles, personnel and proposed beach renourishment dredge vessel and associated sinker pipeline, will give rise to significant potential aerial noise and visual disturbance and associated displacement effects upon significant populations of foraging and loafing SCI bird populations.

It is considered that the risk of adverse effects on the integrity of Rogerstown Estuary SPA as a result of aerial noise and visual disturbance effects on its QI Annex I habitats would occur in the absence of mitigation measures.

#### 4.2.5.2 North-west Irish Sea cSPA

The North-west Irish Sea SPA is designated on account the supported population of SCI birds associated with SPA breeding colonies and wintering SPA bird populations which utilise these areas of marine habitat for foraging and maintenance behaviours.

As set out above, in respect of the Rogerstown Estuary SPA, the proposed working area and the wider areas of estuarine and marine habitat were subject to bird surveys throughout the year from 2021 to 2022.

The findings of these surveys recorded those areas of marine habitat in close proximity to the proposed working area, in addition to areas of the estuary to the west of The Burrow, did not support significant populations of SCI bird species which are likely to be associated with the cSPA.

The findings of the surveys in respect of each of the SCI bird species associated with the cSPA, are set out within Table 4-9 which sets out the total numbers of each SCI species recorded per season.

**Table 4-9 Bird Survey Results: North-west Irish Sea SPA SCI Species**

SCI Bird Species	Mean Number Recorded During the Surveys	Peak Number Recorded During the Surveys	Total Number Recorded Across the Surveys	Population of the NW Irish Sea SPA (As per the Conservation Objectives (NPWS 2023))	Percentage of Population of the NW Irish Sea SPA recorded within the Survey Area (peak) (%)
Common Scoter	0.083	4	4	14567	0.027
Red-Throated Diver	0.208	3	10	827	0.363
Great Northern Diver	0	0	0	176	0
Fulmar	0	0	0	214	0
Manx Shearwater	0	0	0	457	0
Shag	1.417	7	68	1138	0.615
Cormorant	3.688	15	177	831	1.805
Little Gull	0	0	0	391	0
Kittiwake	0	0	0	944	0
Black-headed Gull	156.917	217	7532	508	42.717

SCI Bird Species	Mean Number Recorded During the Surveys	Peak Number Recorded During the Surveys	Total Number Recorded Across the Surveys	Population of the NW Irish Sea SPA (As per the Conservation Objectives (NPWS 2023))	Percentage of Population of the NW Irish Sea SPA recorded within the Survey Area (peak) (%)
Common Gull	68.771	1212	3301	2866	42.289
Lesser Black-backed Gull	4	47	192	618	7.605
Herring Gull	137.875	155	6618	6893	2.249
Great Black-backed Gull	19.208	230	922	2096	10.973
Little Tern	4.750	40	225	168	23.810
Roseate Tern	0.271	5	13	3668	0.136
Common Tern	12.396	150	595	4392	3.415
Arctic Tern	0.333	4	16	98	4.082
Puffin	0	0	0	158	0
Razorbill	0.25	12	12	7353	0.163
Guillemot	0.313	11	15	18553	0.0593

Conservation objectives for the North-west Irish Sea SPA include the numbers of each of the SCI species present within the SPA (NPWS 2023). Of the mean recorded numbers of SCI bird species for which the SPA is designated, only black-headed gull, herring gull and common gull were recorded in numbers representing over 1% of the populations recorded to utilise the SPA, with these birds largely recorded outside of the SPA boundary and likely to represent populations which are typically present within the estuary during the winter period. As such it is considered that the recorded populations of wintering SCI bird species associated with the North-west Irish Sea SPA are unlikely to significantly rely on habitats within the proposed working area, in the context of a wider SPA comprising a total of 2,333km<sup>2</sup>.

In respect of breeding species for which the SPA is designated, it is considered that as they principally relate to previously designated SPA breeding populations, these have been assessed separately in respect of the Lambay Island SPA and Rockabill SPA, discussed below. As set out, it is considered that the site is of extremely low importance for breeding populations of SCI birds associated with the Lambay Island SPA and of low importance for foraging tern populations associated with the nearby Rockabill SPA.

Little tern populations, supported within the site and adjacent areas of marine habitat and which are known to nest within a small colony at the north-eastern tip of the Burrow, are not associated with the SPA populations of the North-west Irish Sea cSPA, those being listed within the conservation objectives

as being wholly associated with the Boyne Estuary SPA. Furthermore, in a study examining behavioural responses of foraging seabirds to disturbance associated with shipping traffic (Fließbach et al. 2019) both common tern and arctic tern, which also share similar ecology and behaviour to little tern, were assigned the lowest disturbance vulnerability indexes of all the seabirds subject to study and were recorded to show minimal behavioural responses to passing vessels. Again, it is considered that areas of foraging habitat used by the species are within a context of much larger areas of suitable habitats within the SPA totalling 2,333km<sup>2</sup>.

On the basis of the information above, it is considered that the Proposed Development, which would involve only limited works within the marine environment, namely the movement and use of the dredge vessel and the associated sinker pipeline to facilitate beach renourishment, would not have potential to give rise to significant adverse effects upon the SCI bird populations associated with the North-west Irish Sea cSPA.

Adverse effects upon SCI populations associated with the North-west Irish Sea SPA as a result of aerial noise and visual disturbance effects therefore can be excluded in the absence of mitigation measures.

#### **4.2.5.3 Lambay Island SPA**

The Lambay Island SPA is designated on account the supported populations of SCI breeding birds and wintering SPA bird populations.

As set out above, in respect of the Rogerstown Estuary SPA, the proposed working area and the wider areas of estuarine and marine habitat were subject to bird surveys throughout the year from 2021 to 2022.

The findings of these surveys recorded those areas of marine habitat in close proximity to the proposed working area, in addition to areas of the estuary to the west of The Burrow, did not support significant populations of SCI bird species which are likely to be associated with the SPA.

The findings of the surveys in respect of each of the SCI bird species associated with the SPA are set out within Table 4-10 which sets out the total numbers of each SCI species recorded per season.

Table 4-10 Bird Survey Results: Lambay Island SPA SCI Species

SCI Bird Species	Mean Number Recorded During the Surveys	Peak Number Recorded During the Surveys	Total Number Recorded Across the Surveys
Fulmar	0	0	0
Cormorant	3.688	15	177
Shag	1.417	7	68
Greylag Goose	0	0	0
Lesser Black-backed Gull	4	47	192
Herring Gull	137.875	155	6618
Kittiwake	0	0	0
Guillemot	0.313	11	15
Razorbill	0.25	12	12
Puffin	0	0	0

Conservation objectives and site synopsis for the Lambay Island SPA (NPWS 2011) include a summary of the numbers of SCI birds which were recorded to be present within the designated area which qualified as selection features in addition to reference to breeding populations associated with adjacent breeding colony SPAs. Of the mean recorded numbers of SCI bird species for which the SPA is designated, only herring gull was recorded in numbers representing over 1% of the populations recorded to utilise the SPA, with these birds largely recorded outside of the SPA boundary and likely to represent populations which are typically present within the estuary during the winter period. As such it is considered that the recorded populations of breeding and wintering SCI bird species associated with the Lambay Island SPA are unlikely to significantly rely on habitats within the proposed working area, in the context of wider areas of available foraging and loafing habitat within marine waters in proximity to the SPA and covered by the North-west Irish Sea cSPA, as discussed above.

It is considered that the site is of extremely low importance for breeding populations of SCI birds associated with the Lambay Island SPA.

On the basis of the above information it is considered that the Proposed Development, which would involve only limited works within the marine environment, namely the movement and use of the dredge vessel and the associated sinker pipeline to facilitate beach renourishment, would not have potential to give rise to significant adverse effects upon the SCI bird populations associated with the Lambay Island SPA.

Adverse effects upon SCI populations associated with the Lambay Island SPA as a result of aerial noise and visual disturbance effects therefore can be excluded in the absence of mitigation measures.

#### 4.2.5.4 Rockabill SPA

The Rockabill SPA is designated on account the supported population of SCI birds associated with breeding colonies, inclusive of a number of tern species and a single wintering species, namely purple sandpiper.

As set out above, in respect of the Rogerstown Estuary SPA, the proposed working area and the wider areas of estuarine and marine habitat were subject to bird surveys throughout the year from 2021 to 2022.

The findings of these surveys recorded those areas of marine habitat in close proximity to the proposed working area, in addition to areas of the estuary to the west of The Burrow, did not regularly support significant populations of SCI bird species which are likely to be associated with the SPA.

The findings of the surveys in respect of each of the SCI bird species associated with the SPA, are set out within Table 4-11 which includes the total numbers of each SCI species recorded across the surveys. These recorded numbers are set out in respect of the SPA populations at Table 4-7, above.

**Table 4-11 Bird Survey Results: Rockabill SPA SCI Species**

SCI Bird Species	Mean Number Recorded During the Surveys	Peak Number Recorded During the Surveys	Total Number Recorded Across the Surveys
Roseate Tern	0.271	5	13
Common Tern	12.396	150	595
Arctic Tern	0.333	4	16
Purple Sandpiper	0.02	1	1

In a study examining behavioural responses of foraging seabirds to disturbance associated with shipping traffic (Fliebsbach et al. 2019) both common tern and arctic tern, which also share similar ecology and behaviour to roseate tern, were assigned the lowest disturbance vulnerability indexes of all the seabirds subject to study and were recorded to show minimal behavioural responses to passing vessels.

The findings of bird surveys undertaken of the site and illustrated in Figure 4.19 - Figure 4.21, recorded that each of these species was primarily recorded to utilise areas outside of the proposed work area, typically to the north and east of the study area. Of the three species only common tern was recorded to utilise the working area in any significant numbers. Again, it is considered that areas of foraging habitat used by the species are within a context of much larger areas of suitable habitats within the wider North-west Irish Sea SPA and surrounding marine habitat.

On the basis of the above information it is considered that the Proposed Development, which would involve only limited works within the marine environment, namely the movement and use of the dredge vessel and the associated sinker pipeline to facilitate beach renourishment, would not have potential to give rise to significant adverse effects upon the SCI bird populations associated with the Rockabill SPA.

Adverse effects upon SCI populations associated with the Rockabill SPA as a result of aerial noise and visual disturbance effects therefore can be excluded in the absence of mitigation measures.

## 4.3 In-Combination Effects

Article 6(3) of the Habitats Directive and Irish national law requires that in-combination effects with other plans or projects are considered. The significance of any identified combined effects of the Proposed Development and other past, present or reasonably foreseeable future plans or projects must also be evaluated. On this basis, the planning portal for Fingal County Council and the An Coimisiún Pleanála portal were searched for other projects within the locality with potential to act in-combination with the Proposed Development.

The only developments with potential to act in-combination with the Proposed Development noted was the parallel application for proposed coastal defence measures at the Rush site, on the other side of the Estuary (north side) from the Proposed Development.

### 4.3.1 Rush: Coastal Defence Scheme

Whilst no formal planning application has yet been submitted, as the lead designer and environmental consultants, RPS are aware that it is the aspiration of FCC to submit a separate proposal for the FRS proposed at Rush south.

Subject to detailed design, it is anticipated the duration of the construction phase of this project will be c. 23 weeks. FCC plan to phase the construction of this scheme after that of the Proposed Development. As such, there will be no temporal or spatial overlap between the two developments.

However, there remains the potential for both schemes to result in an in-combination effect during the operational phase of both developments.

The Proposed Development for Rush is split into three areas: along Channel Road and South Shore Road and also within the Linkside area. The Proposed Development consists of the following main elements:

- Construction of a c.1,055m long flood wall between the western extent of Channel Road and along South Shore Road.
- A c.30m long blockwork wall to consolidate the flood protection between the western extent of Channel Road and the last residential property in this area.
- An alteration of existing ground levels at the western extent of Channel Road to consolidate flood protection and to facilitate the potential future development of a cycle path between Rush and Balleally.
- Provision for flood gates / vehicular / pedestrian access at c.8 locations
- Potential utility diversions

The proposed coastal defence scheme at Rush is illustrated at Figure 4.23.

Predicted impacts arising as a result of the proposed coastal defence scheme at Rush include loss of small areas of qualifying interest habitats of the SAC including intertidal estuarine and mudflat habitats and small areas of Atlantic and Mediterranean salt meadows, at construction phase. Significant operational phase impacts to SCI habitats are not predicted to occur.

In regard to the Rogerstown Estuary SPA, cumulative loss of habitats within the SPA boundary, as discussed above in respect of the SAC, will give rise to synchronous loss of foraging habitat for wintering SCI bird populations. Associated cumulative effects are predicted to arise.

It is considered therefore that the Proposed Development at Rush would have potential to act cumulatively with the Burrow project in respect of all adverse effects predicted to the Rogerstown Estuary SAC. The total areas of qualifying Annex I habitat to be lost are set out within Table 4-12, below.

Table 4-12 Cumulative Losses (temporary and permanent) to Annex I Habitat within Rogerstown Estuary SAC

Annex I Habitat	Area lost as a result of the proposed Burrow Scheme (ha) [% of the total within the SAC]	Area to be temporarily affected by the Proposed Burrow Scheme (Ha) [% of the total within the SAC]	Area lost as a result of the Proposed Development (Rush) (ha) [% of the total within the SAC]	Area to be temporarily affected by the Proposed Development (Rush) (Ha) [% of the total within the SAC]	Total Cumulative Area Lost / Total Area Temporarily Affected (ha) [% of the total within the SAC]
<b>Estuaries [1130]</b>	-	-	0.0469 [0.0175]	2.203 [0.822]	0.0469 [0.0175] / 2.203 [0.822]
<b>Mudflats and sandflats not covered by seawater at low tide [1140]</b>	1.36 [0.368]	12.01 [3.246]	0.0469 [0.013]	2.203 [0.595]	1.407 [0.380] / 14.213 [3.841]
<b>Salicornia and other annuals colonising mud and sand [1310]</b>	-	-	-	-	-
<b>Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330]</b>	0.00016 [0.00043]	0.18 [0.48]	-	0.0452 [0.12]	0.00016 [0.00043] / 0.225 [0.6]
<b>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</b>	-	0.006 [2.18]	-	-	N/A / 0.006 [2.18]
<b>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</b>	-	0.0184 [0.78]	-	-	N/A / 0.0184 [0.78]
<b>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</b>	-	0.79 [9.44]	-	-	N/A / 0.79 [9.44]

Annex I Habitat	Area lost as a result of the proposed Burrow Scheme (ha)	Area to be temporarily affected by the Proposed Burrow Scheme (Ha)	Area lost as a result of the Proposed Development (Rush) (ha)	Area to be temporarily affected by the Proposed Development (Rush) (Ha)	Total Cumulative Area Lost / Total Area Temporarily Affected (ha)
	[% of the total within the SAC]	[% of the total within the SAC]	[% of the total within the SAC]	[% of the total within the SAC]	[% of the total within the SAC]
<b>Annual vegetation of drift lines [1210] (Non-qualifying)</b>	0.0006 [-]	0.34 [-]	-	-	0.341 [N/A]
<b>Perennial vegetation of stony banks [1220] (Non-qualifying)</b>	-	0.062 [-]	-	-	0.062 [N/A]
<b>Embryonic shifting dunes [2110] (Non-qualifying)</b>	-	-	-	-	-

As set out above, minimal and short-term losses to QI Annex I sand dune habitat, including dunes with herbaceous vegetation (grey dunes) [2130] and shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] will occur as a result of the proposed Burrow scheme. However, such impacts will not have potential to act cumulatively with the Proposed Development as the Rush proposals will not give rise to any impacts to these qualifying Annex I habitats.

In regard to the Rogerstown Estuary SPA, cumulative loss of habitats within the SPA boundary, as set out above in respect of the SAC, will give rise to synchronous loss of foraging habitat for wintering SCI bird populations. Associated cumulative effects are predicted to arise.

Furthermore, aerial noise and visual disturbance effects upon SCI bird populations of the Rogerstown Estuary SPA will occur as a result of both schemes, in the absence of mitigation. This disturbance and associated displacement would also have potential to act cumulatively if the schemes were constructed concurrently and consequently give rise to a relatively greater cumulative disturbance and displacement effect with a greater limitation on the available undisturbed area of habitat for wintering populations of SCI bird species.

Other potential indirect construction phase impacts upon the Rogerstown Estuary SAC, SPA including water quality and habitat deterioration effects also have potential to act cumulatively with the Proposed Development.

In addition to impacts to SCI bird populations of the SPA, the Proposed Development will give rise to adverse impacts upon non-qualifying populations of waders and waterfowl which are recorded to utilise the adjacent intertidal habitats for foraging during the wintering period.

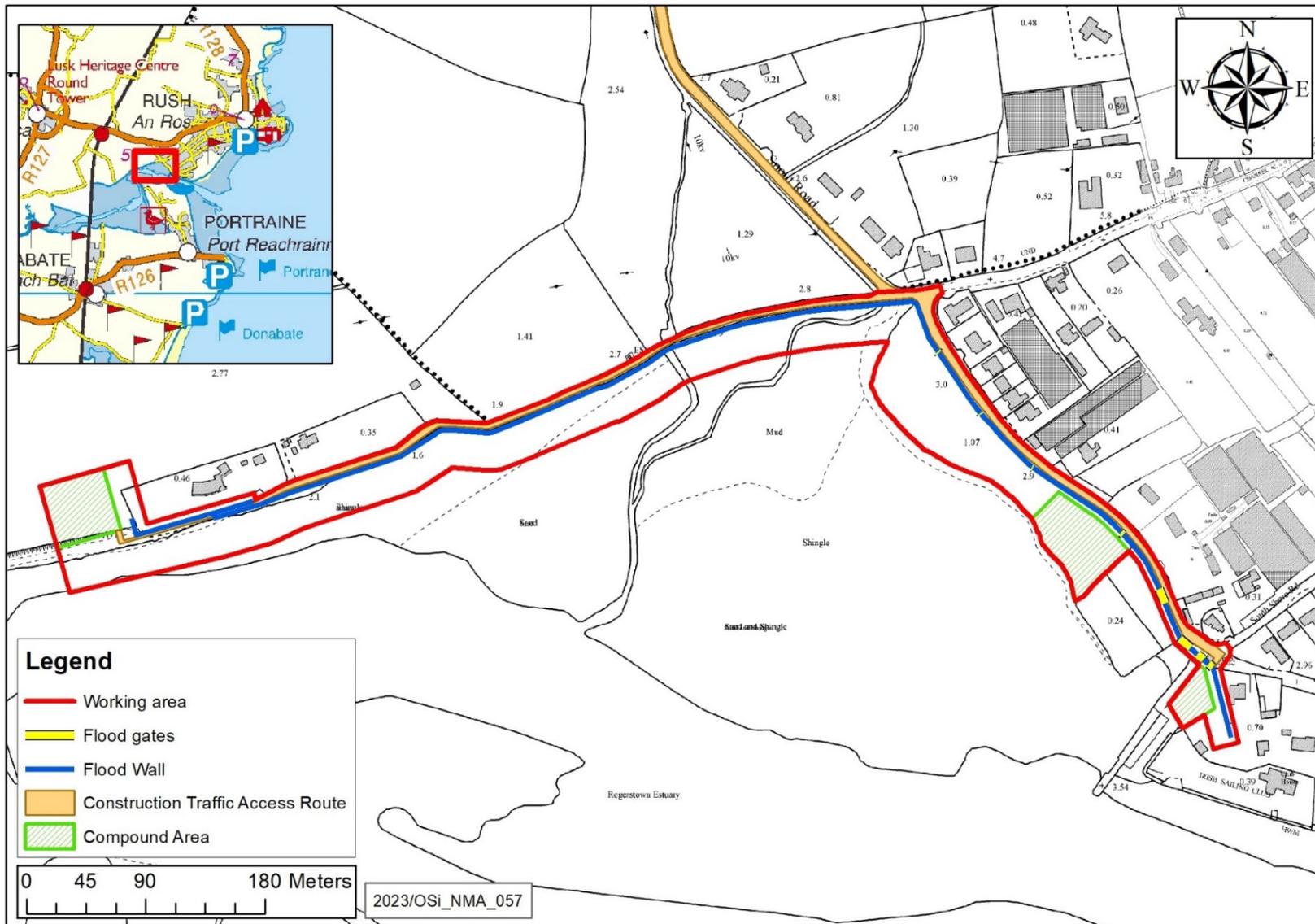


Figure 4.23 Overview of the Proposed Development at Rush, including Site Boundary and Working Areas

## 4.4 Mitigation Measures

### 4.4.1 Water Quality and Habitat Deterioration

The Proposed Development incorporates a range of measures to safeguard the aquatic environment within the marine and estuarine waters of the Rogerstown Estuary SAC and SPA.

#### 4.4.1.1 Construction Phase Best Practice Measures

Mitigation measures implemented by the contractor will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

1. Good practice guidelines on the: Control of Water Pollution from Construction Sites: developed by the Construction Industry Research and Information Association (Technical Guidance C532 CIRIA, 2001);
2. Technical Guidance C648: Control of Water Pollution from Linear Construction Projects, (CIRIA, 2006);
3. Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities;
4. GPP2: Above Ground oil storage tanks.
5. GPP3: use and design of oil separators in surface water drainage.
6. GPP5: Works and maintenance in or near water.
7. PPG6: Working at construction and demolition sites.
8. GPP8: Safe Storage and disposal of used oils.
9. GPP13: Vehicle washing and cleaning.
10. GPP20: Dewatering underground ducts and chambers.
11. GPP21: Pollution incident response planning.
12. GPP22: Dealing with spills.
13. Guidelines on Protection of Fisheries During Constructions Works in and Adjacent to Waters (Inland Fisheries Ireland (2016)).

#### 4.4.1.2 Suspended Sediment and Sedimentation

Suspended sediment, including all soils, sands and rubble is the single main pollutant to the aquatic environment generated at construction sites and largely arises from the erosion of exposed soils and sediments by surface water runoff. The adoption of appropriate erosion and sediment controls during construction is essential to prevent sediment pollution.

As indicated previously the construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principals and good working practices as listed in the Netregs Guidelines for Pollution Prevention (GPP). In addition to the requirements of best practice and relevant guidelines, the following mitigation measures will be implemented by the contractor during the construction phase.

1. Where preferential surface flow paths occur, silt fencing, or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.

2. In the event, that dewatering of foundations or drainage trenches is required during construction and/ or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

Assuming the above mitigation measures are employed during construction activities, the potential impact to receiving water environment will be reduced to negligible thus reducing the significance of environmental effect to *Imperceptible*.

#### **4.4.1.3 Concrete and Cement Pollution**

The impacts in relation to cement and concrete for the Proposed Development are, for the most part (but not limited to); construction of concrete strip foundations to support the cladding of flood walls and concrete capping beams constructed of poured concrete and the demolition of the existing concrete wall.

The principal risks and related mitigation measures are:

1. Concrete use and production shall adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water. Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash etc.; and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10m from the aquatic zone.
2. The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.
3. Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material/ cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

In circumstances where the above mitigation measures are employed during demolition, clearing and flood structure construction operations, the potential impact to receiving water environment will be reduced to negligible thus reducing the significance of environmental effect will be reduced to *Imperceptible*.

#### **4.4.1.4 Fuels, Oils and Chemicals**

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/ spillages of fuels, oils, other chemicals and wastewater) will be controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels. The following measures will be implemented during construction:

1. A detailed works specific Construction Environmental Management Plan (CEMP) will be prepared by the contractor which will meet the minimum requirements of the draft CEMP (under separate cover) and will include detail in respect of every aspect of the works in order to minimise potential impacts and maximise potential benefits associated with the works.
2. Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions.
3. Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants.

4. The use of oils and chemicals on-site requires significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals.
5. Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” will be implemented to ensure safe storage of oils and chemical.
6. The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities”.
7. Contingency Planning: A project specific Pollution Incident Response Plan will be prepared by the contractor consistent and will be in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures are implemented, the finalisation of the draft CEMP is considered to be best practice. The contractor's Environmental Manager will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

In circumstances where the above mitigation measures are employed during construction the significance of environmental effect to the receiving water environment will be reduced to *Imperceptible*.

#### 4.4.2 Spread of Invasive Species

In order to address the potential spread of invasive species, namely common cord-grass (spartina), it is recommended that the construction phase of the Proposed Development is undertaken in line with an appropriately worded Invasive Species Management Plan (ISMP). This ISMP should include the following measures which have been based upon available studies in which control measures for this species were incorporated (Roberts and Pullin 2008; :

- Identification and demarcation of areas of spartina within the proposed working area in advance of the beginning of construction;
- Cutting of above-ground growths of the plant and removal of this material for appropriate disposal;
- Use of barrier membrane (black plastic sheeting) between areas to be stoned and used for construction access and underlying sediments, if required, to provide a barrier between construction machinery and the rhizomes and viable seed of the plant within underlying substrate, and to smother the plants;
- Screening of intertidal mud and other substrates prior to reinstatement of the areas used for construction access to ensure that plant material is not reintroduced to the site prior to reinstatement of such material following completion of the construction;
- The careful removal of temporarily installed construction access and removal and washing of the barrier membrane.
- Provision and use of cleaning facilities for all equipment used within the intertidal environment prior to removal off-site. No machinery is proposed for use along the foreshore in areas which support the species.

Subject to the implementation of these mitigation measures it is considered that any risks associated with the inadvertent spread of invasive cord-grass resulting from construction stage works will be fully mitigated.

#### 4.4.3 Aerial Noise and Visual Disturbance

In order to mitigate potential aerial noise and visual disturbance effects it will be necessary to restrict the construction phase of Proposed Development to taking place outside of the wintering bird period

(October to March). Subject to works being undertaken within the period April to September inclusive it is considered that any potential construction phase aerial noise or visual disturbance effects to SCI bird populations associated with the Rogerstown Estuary SPA will be fully mitigated.

## 5 CONCLUSION OF THE HABITATS DIRECTIVE APPRAISALS

### 5.1 Screening for Appropriate Assessment

Having regard to the relevant legislation and the methodology followed, Supporting Information for Screening for Appropriate Assessment (the SISAA report) was presented to evaluate whether or not the Proposed Development is likely to have a significant effect on three SACs and four SPAs as described within the SISAA report.

LSEs could be excluded at screening stage for one SAC (Lambay Island SAC), without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the proposed site survey activities on the sites concerned.

LSEs could not be excluded at screening stage for six European sites, without further analysis or the application of measures intended to avoid or reduce the harmful effects of the proposed site survey activities on the sites concerned.

The possibility of habitat loss on the following could not be excluded:

- Annex I Mudflats and sandflats not covered by seawater at low tide [1140], Atlantic salt meadows [1330] and fixed dunes with herbaceous vegetation (grey dunes) [2130] of the Rogerstown Estuary SAC; and
- Qualifying wetland habitats of the Rogerstown Estuary SPA.

The possibility of likely significant water quality and subsequent habitat deterioration effects on the following could not be excluded:

- Marine and intertidal habitats including Annex I estuaries and mudflats and sandflats of the Rogerstown Estuary SAC;
- Wetland habitats of the Rogerstown Estuary SPA;
- Marine habitats within the North-west Irish Sea cSPA;
- Marine habitats utilised by Annex II harbour porpoise populations associated with the Rockabill to Dalkey Island SAC; and
- Marine habitats utilised by foraging populations of tern likely to be associated with the Rockabill SPA.

The possibility of likely significant effects arising through spread of invasive species on the following could not be excluded:

- Marine and intertidal habitats including Annex I estuaries, mudflats and sandflats and Atlantis and Mediterranean salt marsh of the Rogerstown Estuary SAC;
- Wetland habitats of the Rogerstown Estuary SPA;

The possibility of likely underwater noise and vibrational disturbance effects on the following could not be excluded:

- Annex II harbour porpoise associated with the Rockabill to Dalkey Island SAC.

The possibility of likely significant aerial noise and visual disturbance effects on the following could not be excluded:

- SCI bird populations of the Rogerstown Estuary SPA;
- SCI bird populations of the North-west Irish Sea cSPA;
- SCI bird populations of the Lambay Island SAC;

- SCI breeding bird populations of the Rockabill SPA;

## 5.2 Natura Impact Statement

A NIS of the implications of the Proposed Development on European sites was prepared including further assessment of the potential effects and receptors in addition to the introduction of measures intended to avoid or reduce the harmful effects of the proposed site survey activities on European sites, and these measures are set out at Section 4.4.

Further assessment, as set out in Section 4.2, provided sufficient certainty (beyond reasonable scientific doubt) to the authors of the NIS, that the Proposed Development would not give rise to adverse effects upon the integrity of the relevant European sites via the respective pathway for effect:

- Water quality and habitat deterioration effects upon the Rockabill to Dalkey Island SAC;
- Water quality and habitat deterioration effects upon the Rockabill SPA;
- Underwater noise and vibrational disturbance effects upon the Rockabill to Dalkey Island SAC;
- Aerial noise and visual disturbance effects upon the North-west Irish Sea cSPA;
- Aerial noise and visual disturbance effects upon the Lambay Island SPA;
- Aerial noise and visual disturbance effects upon the Rockabill SPA;

The NIS has identified that the Proposed Development would have potential to give rise to adverse impacts upon the integrity of a number of European sites in the absence of mitigation measures as follows:

- Habitat loss within the Rogerstown Estuary SAC;
  - Mudflats and sandflats not covered by sea water at low tide [1140]: 0.37% of the SAC habitat extent permanently affected.
  - Atlantic salt meadows [1330]: 0.00043% of the SAC habitat extent permanently affected.
  - Fixed dunes with herbaceous vegetation (grey dunes) [2130]: 9.44% of the SAC habitat extent temporarily affected.
- Habitat loss within the Rogerstown Estuary SPA;
- Water quality and habitat deterioration effects upon the Rogerstown Estuary SAC;
- Water quality and habitat deterioration effects upon the Rogerstown Estuary SPA;
- Water quality and habitat deterioration effects upon the North-west Irish Sea cSPA;
- Effects associated with the spread of invasive species within the Rogerstown Estuary SAC;
- Effects associated with the spread of invasive species within the Rogerstown Estuary SPA;
- Aerial noise and visual disturbance effects upon the Rogerstown Estuary SPA.

Mitigation measures will be put in place to ensure that effects arising through water quality and habitat deterioration effects, the spread of invasive species and the appropriate timing of works (outside of the wintering bird period) will effectively mitigate these potential adverse impacts and ensure that they will not adversely affect the integrity of any European site.

The following potential adverse impacts to the integrity of European sites cannot be ruled out as mitigation cannot be prescribed which will effectively minimise the predicted effects arising through habitat loss:

- Habitat loss (permanent) effects upon Annex I mudflats and sandflats not covered by sea water at low tide [1140], Atlantic salt meadows [1330] and fixed dunes with herbaceous vegetation (grey dunes) [2130] associated with the Rogerstown Estuary SAC; and

- Loss of wetland habitats of importance for SCI populations of the Rogerstown Estuary SPA.

All aspects of the Proposed Development which, by itself, or in combination with other plans or projects, may affect the relevant European Sites have been considered. The SISAA report and NIS contain information which the Department and the Minister may consider in making their own complete, precise and definitive findings and conclusions and upon which the public authority is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Proposed Development on the integrity of the relevant Natura 2000 sites, where set out within this document.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the relevant public authority is enabled to ascertain that the Proposed Development may give rise to adverse impacts upon the integrity of two European sites namely the Rogerstown Estuary SAC and the Rogerstown Estuary SPA, through habitat loss effects associated with the footprint of the Proposed Development.

## 6 NEXT STEPS

An appropriate assessment of the potential for the proposed coastal flood and erosion defence works at the Burrow should be completed by An Coimisiún Pleanála in compliance with the relevant European Commission and national guidelines to determine whether or not the Proposed Development will give rise to adverse impacts upon the integrity of any European site as a result of the construction or operation of the Proposed Development or whether such effects could be discounted or addressed through the implementation of mitigation measures.

It is considered, on the basis of the information contained in this document that the Proposed Development will give rise to adverse impacts upon the integrity of two European sites including:

- Habitat loss (temporary and permanent) effects upon Annex I qualifying mudflats and sandflats not covered by sea water at low tide [1140], Atlantic salt meadows [1330] and fixed dunes with herbaceous vegetation (grey dunes) [2130] associated with the Rogerstown Estuary SAC; and
- Loss of wetland habitats of importance for SCI populations of the Rogerstown Estuary SPA.

In line with the step-wise procedure set out within the Habitats Directive, as discussed at Section 1.1.5, it is suggested that the Proposed Development should proceed to consideration under Article 6(4) of the Habitats Directive and the competent authority must decide if it can be progressed for imperative reasons of overriding public interest (IROPI).

It is considered likely that a do-nothing scenario would result in the continued erosion of areas of Annex I habitat along the eastern shore of the Burrow, inclusive of areas of dune habitat which have already been subject to significant reduction in area through erosion from the time of designation of the Rogerstown Estuary SAC to present.

The proposals will incorporate flood defence structures which in addition to their primary intended function, of protecting properties at The Burrow from coastal flooding, are anticipated to promote the protection and potential restoration of QI Annex I coastal habitats of the Rogerstown Estuary SAC namely areas of fixed dunes with herbaceous vegetation (grey dunes).

Based on the information presented within this NIS, it is considered that the proposals have been designed to involve the minimal possible land take from within the Rogerstown Estuary SAC and SPA while achieving the project aims and will incorporate a range of mitigation measures to prevent a range of further potential effects upon a range of European sites.

Fingal County Council therefore request consent to undertake the proposed coastal flood defence works in order to protect a large number of properties from coastal flooding and, in concert, deliver the protection of Annex I habitats of the Rogerstown Estuary SAC from continued erosion.

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## **APPENDIX A: SUPPORTING INFORMATION FOR SCREENING FOR APPROPRIATE ASSESSMENT**

# SUPPORTING INFORMATION FOR SCREENING FOR APPROPRIATE ASSESSMENT

The Burrow: CFERM Scheme



NI2330 The Burrow CFERM  
Scheme  
SISAA  
F01  
December 2024

**Document Status**

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# 1 INTRODUCTION

With the introduction of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitat and of wild fauna and flora) came the obligation to establish the Natura 2000 network of Sites of Community Interest (SCIs), comprising a network of areas of highest biodiversity importance for rare and threatened habitats and species across the European Union (EU).

In Ireland, the Natura 2000 network of sites comprises Special Areas of Conservation (SACs, including candidate SACs) designated under domestic legislation transposing Directive 92/43/EEC, and Special Protection Areas (SPAs, including proposed SPAs) classified under the Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) and designated under the same domestic legislation.

SACs are designated for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are designated for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is designated correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

SACs and SPAs make up the pan-European network of Natura 2000 sites. It should be noted that 'European sites' are defined in Regulation 2(1) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended ('the 2011 Regulations') and Section 177R of the Planning and Development Act 2000, as amended ('the 2000 Act').

## 1.1 Appropriate Assessment

### 1.1.1 The Habitats Directive

A key protection mechanism in the Habitats Directive is the requirement to subject plans and projects to Appropriate Assessment (AA) in line with the requirements of Article 6(3) of the Habitats Directive, which 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. 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.*

Thus, Article 6(3) defines a step-wise procedure for considering plans and projects:

- The first part of this procedure consists of a preliminary 'screening' stage to determine whether, firstly, the plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by the first sentence of Article 6(3).
- The second part of the procedure, governed by the second sentence of Article 6(3), relates to the appropriate assessment and the decision of the competent national authorities.

### 1.1.2 Domestic Transposition

#### 1.1.2.1 Screening

Regulation 42 of the 2011 Regulations requires *inter alia* that screening for appropriate assessment of a project for which an application for consent is received, and which is not directly connected with or necessary to the management of the site as a European Site, 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 project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.

Section 177U of the 2000 Act requires *inter alia* that a screening for appropriate assessment of an application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site.

### 1.1.2.2 Appropriate Assessment

Regulation 42 of the 2011 Regulations requires *inter alia* that a public authority shall determine that an appropriate assessment of a project is required where the project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening that the project, individually or in combination with other plans or projects, will have a significant effect on a European site.

Section 177V of the 2000 Act requires *inter alia* that an appropriate assessment carried out by the competent authority shall include a determination under Article 6(3) of the Habitats Directive as to whether or not a proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority where it has made a determination under section 177U(4) that an appropriate assessment is required, before consent is given for the proposed development.

### 1.1.3 The Appropriate Assessment Procedure

According to European Commission guidance documents 'Assessment of plans and projects in relation to Natura 2000 sites' (EC, 2021); 'Guidance document on wind energy developments and EU nature legislation' (EC, 2020); and 'Managing Natura 2000 sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' (EC, 2019); the obligations arising under Article 6 establish a step-wise procedure as illustrated in **Figure 1.1**.

The first part of this procedure consists of a pre-assessment stage ('screening') to determine whether, firstly, a plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by Article 6(3), first sentence.

The second part of the procedure, governed by Article 6(3), second sentence, relates to the appropriate assessment and the decision of the competent national authorities.

A third part of the procedure (governed by Article 6(4)) comes into play if, despite adverse effects on the integrity of the site concerned, it is proposed not to reject a plan or project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

The extent to which the sequential steps of Article 6(3) apply to a given plan or project depends on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of a Habitats Directive stage one screening appraisal is that significant effects on European sites can be excluded in the absence of any best practice or targeted measures intended to avoid or reduce the harmful effects of the proposed development on European sites, there is no requirement to proceed to the next step.

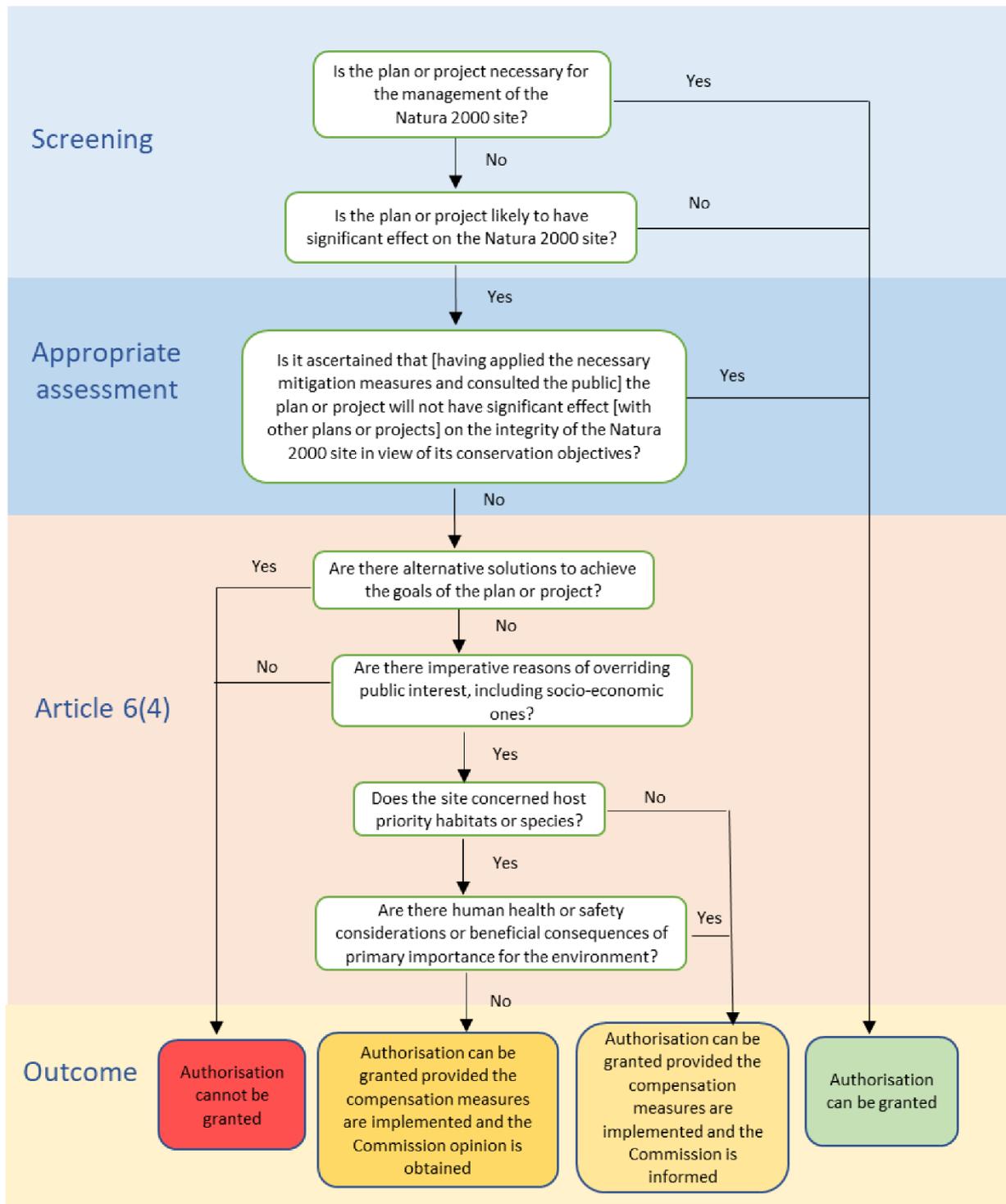


Figure 1.1: Step-wise procedure of Article 6 of the Habitats Directive (from EC, 2021)

## 1.2 Document Structure

### 1.2.1 Objective of the Document

The purpose of this document which contains information to support screening for appropriate assessment (supporting information for screening for appropriate assessment or 'SISAA') is to provide the competent authority with information to assist them in carrying out a screening for appropriate assessment of the implications of the proposed coastal defence and beach nourishment project at the Burrow on European sites in view of their conservation objectives.

This exercise has been conducted on behalf of Fingal County Council in support of an application to An Bord Pleanála for planning consent.

This SISAA report seeks to assist An Bord Pleanála as a public authority under the 2011 Regulations in fulfilling their obligations to conduct a screening for appropriate assessment, and where applicable, an appropriate assessment.

### 1.2.2 Methodology and Guidance

Section 2 of the SISAA report, sets out the methodology and guidance documents used in conducting a screening appraisal for appropriate assessment and subsequent appraisal for appropriate assessment of the implications of the proposed development on European sites.

### 1.2.3 Proposed Development

Section 3 of the SISAA report describes the proposed development, the general methodology sequence and activities to be undertaken.

### 1.2.4 Information for Stage 1 Screening Appraisal

Section 4 of the SISAA report contains a preliminary examination and analysis to understand whether or not the proposed development is likely to have a significant effect on any European site. This is the information for screening appraisal for appropriate assessment. It has been undertaken in view of best scientific knowledge, in light of the Conservation Objectives of the sites concerned and considers the proposed development individually or in combination with other plans and projects. In accordance with EC guidance and settled case law of the CJEU, measures intended to avoid or reduce the harmful effects of the proposed development on European sites, (i.e. "mitigation measures") or best practice measures have not been taken into account in the screening stage appraisal.

## 2 METHODOLOGY

### 2.1 Published guidance on Appropriate Assessment

Appropriate Assessment Guidelines for Planning Authorities have been published by the Department of the Environment Heritage and Local Government ([DEHLG, 2010a](#)) and more recently by the Office of the Planning Regulator Practice Note (PN01) ([OPR, 2021](#)). In addition to the advice available from the Department, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of Appropriate Assessment, most notably including Notice C(2021) 6913 '*Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC*', which sets out the principles of how to approach decision making during the process. These principal national and European guidelines have been followed in the preparation this SISAA report. The following list identifies these and other pertinent guidance documents:

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg (EC, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg (EC, 2007);
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. Office for Official Publications of the European Communities, Luxembourg (EC, 2009);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities, Dublin (DEHLG, 2010b);
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging. Office for Official Publications of the European Communities, Luxembourg (EC, 2011a);
- European Commission Staff Working Document 'Integrating biodiversity and nature protection into port development', Office for Official Publications of the European Communities, Luxembourg (EC, 2011b);
- European Commission Note on Setting Conservation Objectives for Natura 2000 Sites, Office for Official Publications of the European Communities, Luxembourg (EC, 2012);
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012);
- Interpretation Manual of European Union Habitats. Version EUR 28. Office for Official Publications of the European Communities, Luxembourg (EC, 2013a);
- Guidelines on Climate Change and Natura 2000. Office for Official Publications of the European Communities, Luxembourg (EC, 2013b);
- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects. Department of Communications, Climate Action and Environment, Dublin (DCCAE, 2017);
- European Commission Notice C(2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2019);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.1)', London (IAQM, 2020);

- European Commission Notice C(2020) 7730 ‘Guidance document on wind energy developments and EU nature legislation’, Office for Official Publications of the European Communities, Luxembourg (EC, 2020);
- Office of the Planning Regulator Practice Note (PN01) ‘Appropriate Assessment Screening for Development Management’, Dublin (OPR, 2021);
- European Commission Notice C(2021) 6913 ‘Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC’, Office for Official Publications of the European Communities, Luxembourg (EC, 2021); and
- European Commission Guidance document on Assessment of plans and projects in relation to Natura 2000 sites - A summary, Office for Official Publications of the European Communities, Luxembourg (EC, 2022).

## 2.2 Likely Significant Effect

The Commission’s 2018 Notice (EC, 2019) advises that the appropriate assessment procedure under Article 6(3) is triggered not by the certainty but by the likelihood of significant effects, arising from plans or projects regardless of their location inside or outside a protected site. Such likelihood exists if significant effects on the site cannot be excluded. The significance of effects should be determined in relation to the specific features and environmental conditions of the site concerned by the plan or project, taking particular account of the site’s conservation objectives and ecological characteristics.

The threshold for a Likely Significant Effect (“LSE”) is treated in the screening exercise as being above a *de minimis* level. A *de minimis* effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present on a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be LSEs.

The analysis involved in a Stage 1 screening appraisal for Appropriate Assessment is described in EC (2021) as comprising four steps:

- ascertaining whether the plan or project is directly connected with or necessary to the management of a Natura 2000 site;
- identifying the relevant elements of the plan or project and their likely impacts;
- identifying which (if any) Natura 2000 sites may be affected, considering the potential effects of the plan or project alone or in combination with other plans or projects;
- assessing whether likely significant effects on the Natura 2000 site can be ruled out, in view of the site’s conservation objectives.

Case law of the Court of Justice of the European Union (CJEU) has confirmed that a significant effect is triggered when:

- there is a probability or a risk of a plan or project having a significant effect on a European site;
- the plan is likely to undermine the site’s conservation objectives; and
- a significant effect cannot be excluded on the basis of objective information.

EC (2021) defines a LSE as being “any effect that may reasonably be predicted as a consequence of a plan or project that would negatively and significantly affect the conservation objectives established for the habitats and species significantly present on the Natura 2000 site. This can result from either on-site or off-site activities, or through combinations with other plans or projects”.

The requirement that the effect in question be ‘significant’ exists in order to lay down a *de minimis* or negligible threshold – thus, plans or projects that have no appreciable or imperceptible effects on the site are thereby excluded.

## 2.3 Mitigation Measures

In determining whether or not likely significant effects will occur or can be excluded in the Stage 1 appraisal, measures intended to avoid or reduce the harmful effects of the proposed development on European sites, (i.e. “mitigation measures”) or best practice measures have not been taken into account. This approach is consistent with up-to-date EU guidance (EU,2019; EC,2021; EC, 2022) and the case law of the Court of Justice of the European Union (CJEU).

EC (2001) states that “project and plan proponents are often encouraged to design mitigation measures into their proposals at the outset. However, it is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site”. This direction in the European Commission’s guidance document is unambiguous in that it does not permit the inclusion of mitigation at screening stage.

In April 2018, the Court of Justice of the European Union issued a ruling in case C-323/17 *People Over Wind & Peter Sweetman v Coillte Teoranta* (“People Over Wind”) that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

The judgment in *People Over Wind* is reaffirmed in up-to-date EC guidance documents which refers to CJEU Case C-323/17.

## 2.4 Consideration of *ex-situ* effects

EC (2019) advises that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites but which are likely to have significant effects on any of them.

The CJEU developed this point when it issued a ruling in case C-461/17 (“*Brian Holohan and Others v An Bord Pleanála*”) that determined *inter alia* that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an appropriate assessment must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.

In that regard, consideration has been given in this Habitats Directive appraisal to implications for habitats and species located both inside and outside of the European sites considered in the screening appraisal with reference to those sites’ Conservation Objectives where effects upon those habitats and/or species are liable to affect the conservation objectives of the sites concerned.

## 2.5 Conservation Objectives

The conservation objectives for each European site are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the site has been selected. The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;
- 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 (or condition, at a site level) 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;
- 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.

EC (2022) advises that an assessment should be done for all of the designating features (species, habitat types) that are significantly present on the site (habitats and species with A, B or C, but not D, site assessment in the Standard Data Form for the site) in view of their conservation objectives. EC (2022) additionally notes that *“the lack of site-specific conservation objectives or the establishment of conservation objectives, which are not in line with the required standard, as specified in the Commission note on “Setting conservation objectives of Natura 2000 sites” (EC, 2012), jeopardises compliance with the requirements of Article 6(3)”*.

### 2.5.1 Site-Specific Conservation Objectives

NPWS began preparing detailed Site-Specific Conservation Objectives (SSCOs) for European sites in 2011. The European sites within closest proximity to the Proposed Development which are considered in some detail in this SISAA report have all had SSCO set. The published SSCO documents are as described in Section 4.1 of this document.

The published SSCO documents note that an appropriate assessment based on the most up to date conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.

The most up-to-date Conservation Objectives for the European sites being considered, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites is based on publicly available data on these European Sites, sourced from the [NPWS website](#) in September 2023.

### 2.5.2 In-combination Effects

Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are also considered. As set out in the Commission’s 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, cumulative effects and the vulnerability of the habitats and species concerned. Whilst the Directive does not explicitly define which other plans and projects are within the scope of the in-combination provision of Article 6(3), it is important to note that the underlying intention of this provision is to take account of cumulative impacts, and these will often only occur over time.

In that context, one can consider plans or projects which are completed, approved but uncompleted, or proposed. EC (2019) specifically advises [on p43] that *“as regards other proposed plans or projects, on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced”*.

EC (2021) additionally advises that:

- an in-combination assessment is often less detailed at the screening stage than in the appropriate assessment;
- there is still a need to identify all other plans or projects that could give rise to cumulative impacts with the plan or project in question and
- if this analysis cannot reach definitive conclusions, it should at least identify any other relevant plans and projects that should be scrutinised in more detail during the appropriate assessment.

## 3 THE PROPOSED DEVELOPMENT

### 3.1 Location of Project and Site Characteristics

The Proposed Development is located at the Burrow which is a sandy spit that separates the outer Rogerstown Estuary from the Irish Sea as illustrated in **Figure 3.1**. The Burrow is fronted by a wide sandy beach as illustrated in **Figure 3.2** and **Figure 3.3** and is bordered by rock headlands at Rush towards the north and Portrane to the south.

The nature of the spit and beach is strongly influenced by the tidal action of the estuary and waves approaching the shoreline from the Irish Sea. Lambay Island, which lies around 5km east of the beach, also influences both the wave and tidal conditions.

A considerable amount of unplanned development has occurred over the years. This is recognised in the Fingal County Development Plan 2017-2023, where the gradual removal of temporary homes is encouraged, whilst the replacement of temporary homes with permanent dwellings is discouraged.

For more than a decade, the Burrow has been adversely affected by episodes of acute coastal erosion which were in turn driven by extreme storm events. In 2018 Storm Emma and a succession of other events resulted in the shoreline retreating by more than 20m along some sections of the Burrow. The coastal retreat during this episode was so severe that a private residential property had to be abandoned and demolished some months later.

Before the installation of interim coastal protection works in 2018 which were designed to slow the rate of erosion until a more sustainable long-term protection solution could be developed, the rate of erosion along the Burrow coastline typically ranged between 2 – 3 metres per year. The interim coastal protection works, i.e., the concrete seabee units which are shown in Figure 3.3 have effectively reduced erosion rates since they were installed. However much of the coastline remains vulnerable to erosion, particularly during periods of high tides or surge activity when waves can propagate over the units and freely attack the coastline.



**Figure 3.1: Location of the project site at the Burrow, Fingal, County Dublin**



**Figure 3.2: Southerly aerial view of the beach at the Burrow (2019)**



**Figure 3.3: Northerly aerial view of the beach at the Burrow (2019)**

## 3.2 Proposed Development

In February 2018 RPS were commissioned by Fingal County Council (FCC) to assess the feasibility of a sustainable coastal flood protection scheme to reduce the flood risk that exists across the Burrow. Following Storm Emma and several other arduous storm events that occurred in the winter of 2017/2018, the position of the shoreline at Burrow retreated by more than 20m in some areas. Consequently, the scope of the RPS commission was extended to include for the development of interim emergency coastal protection works (Seabees) and a longer-term erosion management solution. The interim measures were installed until such time that the longer-term solution, as identified in the Coastal Flooding and Erosion Risk Management (CFERM) study could be implemented.

The Proposed Development builds on the preferred option as identified in the CFERM study (RPS, 2020). It should be noted that this study also identified a preferred scheme for Rush South which is located on the northern side of the Rogerstown estuary. However, this scheme is being considered independently given that the Proposed Development for the Burrow and the preferred scheme at Rush do not rely upon one another, with each addressing specific risks (i.e., erosion and flooding at the Burrow and only flooding at Rush South).

The Proposed Development for the Burrow is split into three areas, the northern extent of the spit at the end of Burrow Road, at Marsh Lane, and along Portrane beach. The Proposed Development consists of the following main elements:

- Construction of a c.190m long earth embankment at the end of Burrow Road,
- Construction of a c.130m long sheet piled flood wall and a c. 200m embankment along Marsh Lane,
- Installation of back drainage behind the proposed defences with associated outfalls,
- Installation of non-return valves to existing outfalls to prevent backflow of water from the estuary,
- The construction of c. seven fishtail (or 'Y' shaped) groynes structures in combination with a beach renourishment scheme at Portrane beach. These groyne structures will help control the longshore and cross-shore transport elements of the prevailing littoral drift along c.1.3km of the coastline of the Burrow.
  - Each groyne will extend seaward by approximately 70m at a spacing of c.175m to create seven sediment sub-cells along the Burrow. The total footprint of the proposed groynes will equate to c.1.36 hectares;
  - The beach re-nourishment will involve transporting dredged material from a licenced marine aggregate extraction site (presently assumed to be Liverpool Bay) to the Burrow and pumping the material ashore to fill each of the seven sediment sub-cells created by the fishtail groyne structures.

The location and extent of the Proposed Development are illustrated Figure 3.4 overleaf. Typical cross-sections and further information regarding the flood embankments, flood walls and beach elements are presented in Figure 3.5 to Figure 3.7 respectively. Further information on each of these elements is presented in the following sections of this Chapter.

The primary objectives of the Proposed Development are to:

- Provide effective coastal flood protection during a 0.5% Annual Exceedance Probability (AEP) event based on the Medium Range Future Scenario (MRFS) whereby sea levels are expected to rise by +0.50m by 2100,
- Mitigate the ongoing coastal retreat along the beach frontage,
- Restore and enhance the recreational value of the natural beach amenity which has significantly deteriorated over recent years due to an overall loss of sand material from the beach,
- Enhance and protect some of the qualifying features of the nearby environmentally designated sites which have been deteriorated by chronic and acute erosion over recent years.

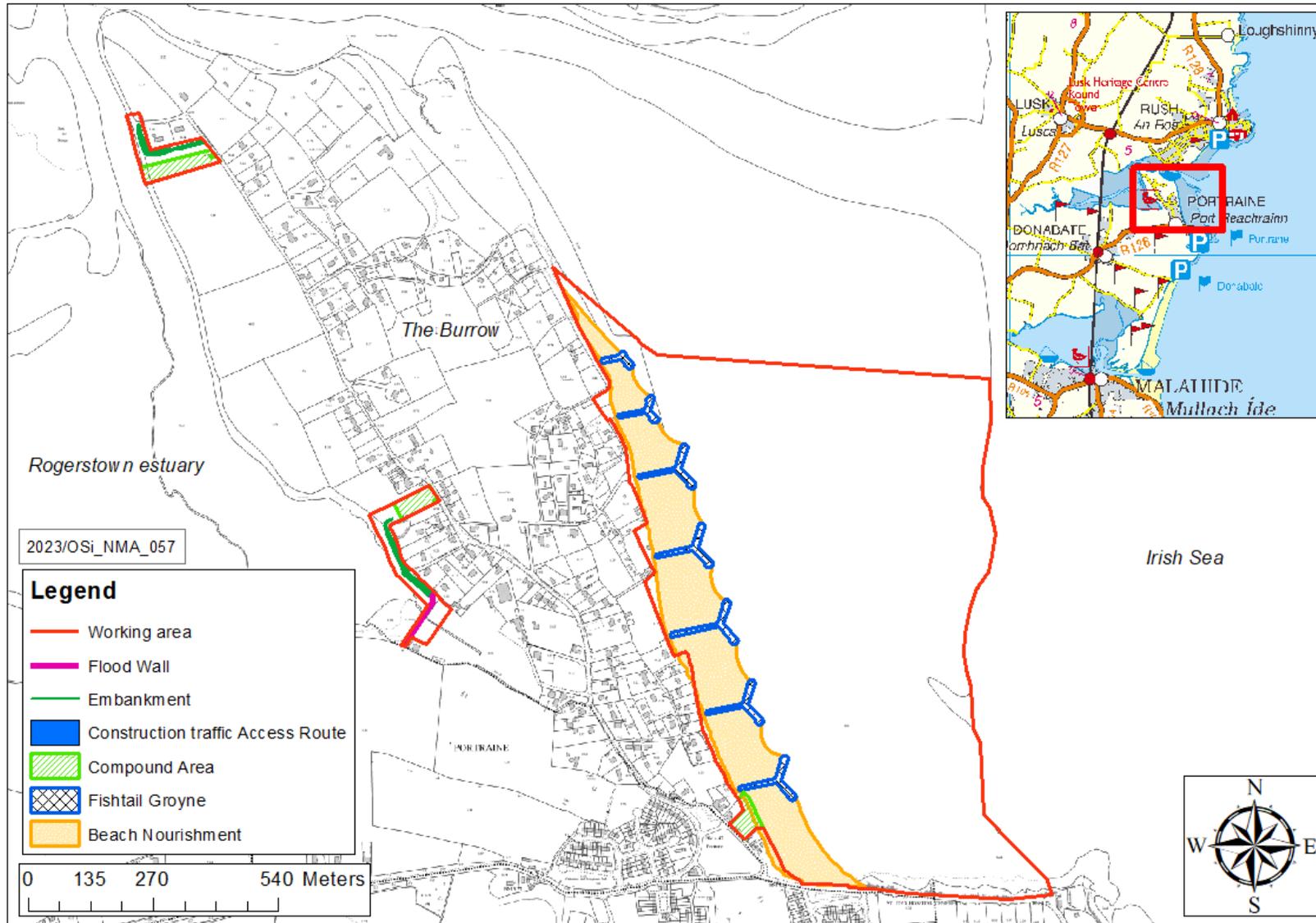


Figure 3.4 Overview of the Proposed Development at the Burrow, including Site Boundary and Working Areas

### 3.2.1 Flood Embankments at Burrow Road & Marsh Lane

The function of the flood embankment structures at Burrow Road and Marsh Lane is to prevent coastal flooding caused by tidal inundation. An overview of the design details for these structures is listed below:

- The embankments will be constructed with 1 in 2.5 side slopes on both sides.
- The embankments will be constructed with a 1m wide centre to allow for easy and safe access to inspect and maintain the embankment.
- The core will be comprised of suitable clay material which will be compacted within a trench to the sub-formation level.
- The embankments will be built up to the design crest level of 4.02mOD using compacted layers of suitable granular fill to SHW Series 600.
- The embankments will be covered by topsoil and seeded to promote the growth of vegetation.

A summary of the key metrics associated with the flood embankments is presented in **Table 3.11** below.

**Table 3.1: Summary of the extent, footprint and construction volumes for the flood embankments at Burrow Road and Marsh Lane**

Metric	Marsh Lane Embankment	Burrow Road Embankment	Total
Length [m]	200	190	390m
Footprint [m <sup>2</sup> ]	1,580	1,304	2,884m <sup>2</sup>
Volume of existing material to excavate [m <sup>3</sup> ]	776	856	1,632m <sup>3</sup>
Volume of clay material to import [m <sup>3</sup> ]	198	190	388m <sup>3</sup>
Volume of granular fill to import [m <sup>3</sup> ]	1,250	567	1,817m <sup>3</sup>

### 3.2.2 Flood Wall at Marsh Lane

The function of the flood wall structure at Marsh Lane is to tie into the proposed flood embankment (see previous section) and prevent coastal flooding caused by tidal inundation along a section of coastline where there is insufficient space to construct an embankment. An overview of the design details for this structure is listed below:

- The c.130m flood wall will consist of sheet piling to the defined defence level of 3.82mOD with a concrete strip foundation to support the cladding on both sides.
- The sheet piling will be completed with coping detail along the crest.
- Based upon preliminary ground investigation work, the toe depth is likely to be in the region of -10mOD. This should be confirmed at the detailed design phase.
- Facing panels or cladding can be implemented if required to give the appearance of a concrete or masonry wall.

- Back drainage will be installed at the dry side of the piled flood wall.

### 3.2.3 Fishtail groyne structures

To limit the loss of beach re-nourishment material along Portrane beach and to provide wave protection to the coast, the Proposed Development includes the construction of seven fishtail groyne structures along c. 1.3km of the beachfront. An overview of the design details for these structures is listed below:

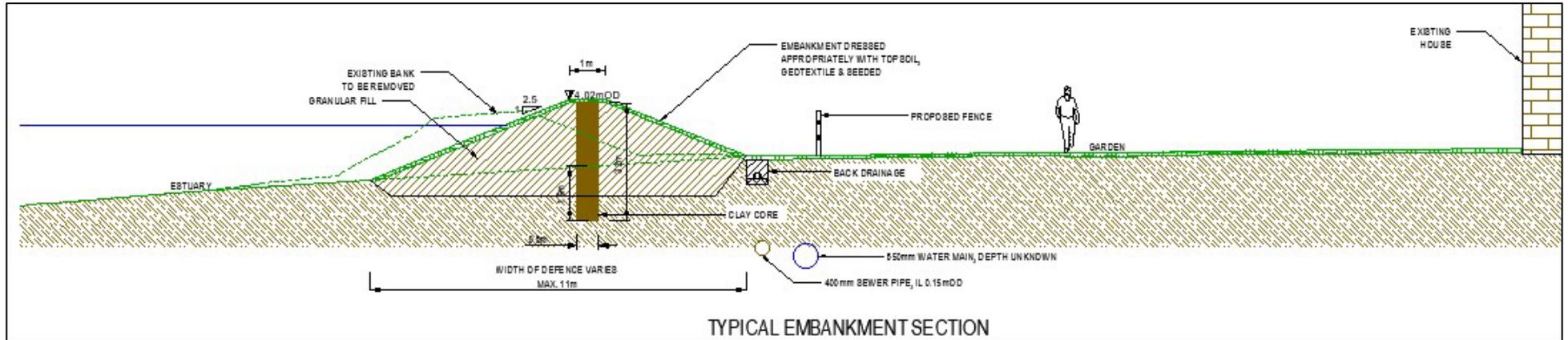
- Each groyne structure will extend seaward for approximately 70m, before splitting into a “fishtail” or a “Y-shape”. Each groyne will then extend seaward for an additional c.40m at a 120° angle.
- The core of the c. 70 trunk of each groyne will be constructed by re-using the existing seabee units which are already on the beach.
- The landward edge of each groyne structure will be constructed 10m seaward of the coastline to facilitate pedestrian access along the upper foreshore.
- The seabee units will be placed on a bedding layer and a 0.3 – 1.0T underlayer, separated from the beach using a heavy-duty geotextile.
- A single layer of 0.3 – 1.0T rock armour will be placed over the Seabee units at a slope of 1:1.5.
- The fishtail structures will be constructed exclusively of rock fill and rock armour (i.e., no seabee units).
- The filter layer of each fishtail structure will be placed onto and wrapped in a heavy-duty geotextile.
- The crest level of each groyne structure will be constructed to c.4.25mOD at the shoreline and slope to c.2.85mOD at the seaward side of the fishtails.
- The fishtails will be constructed with a consistent crest level of c.2.85mOD.

The total footprint of the seven groyne structures equates to c.13,615m<sup>2</sup>, whilst approximately 42,000T of rock armour/core material will be required to construct the seven groynes (subject to detailed design).

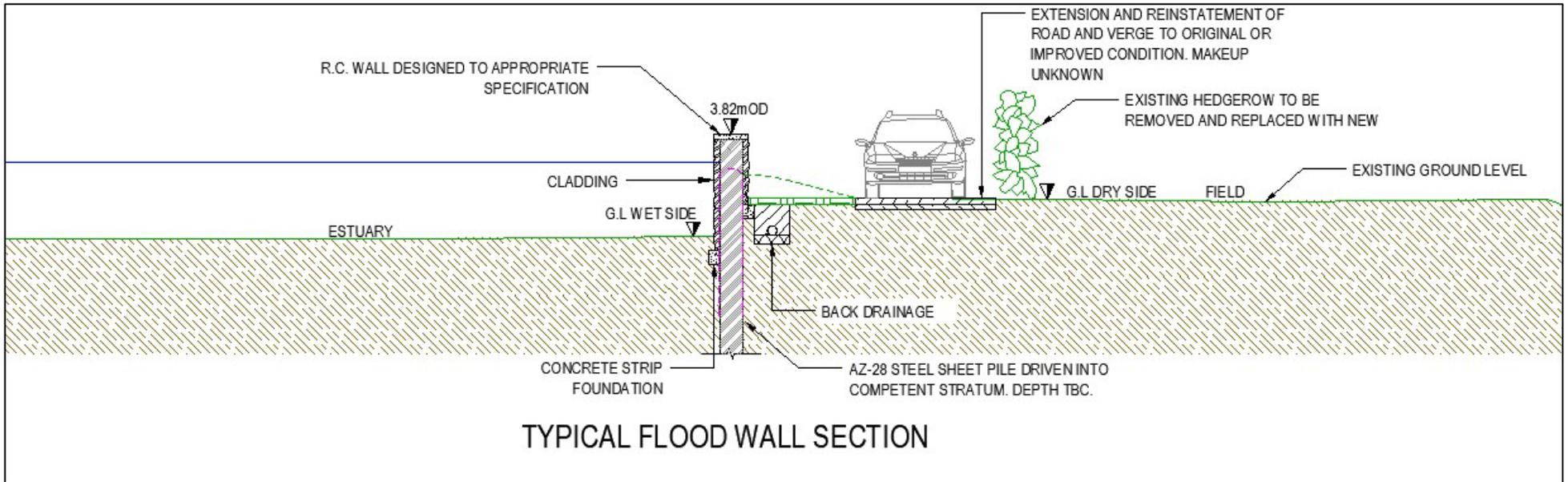
### 3.2.4 Beach re-nourishment

Upon completion of the groyne structures, the sub-cell areas will be filled with beach nourishment material imported from a licenced marine aggregate extraction site (presently assumed to be Liverpool Bay). Based on present-day beach levels, it is envisaged that c.425,000m<sup>3</sup> of material will be required to achieve the proposed beach levels of c. 3.0mOD.

The nourished beach profile within each groyne sub-cell has been designed to provide a c.25m flat upper foreshore at c. 3.0mOD before sloping down to meet existing beach levels.



**Figure 3.5: Cross-section of a typical embankment at Marsh Lane and Burrow Road**



**Figure 3.6: Cross section of a typical flood wall at Marsh Lane**

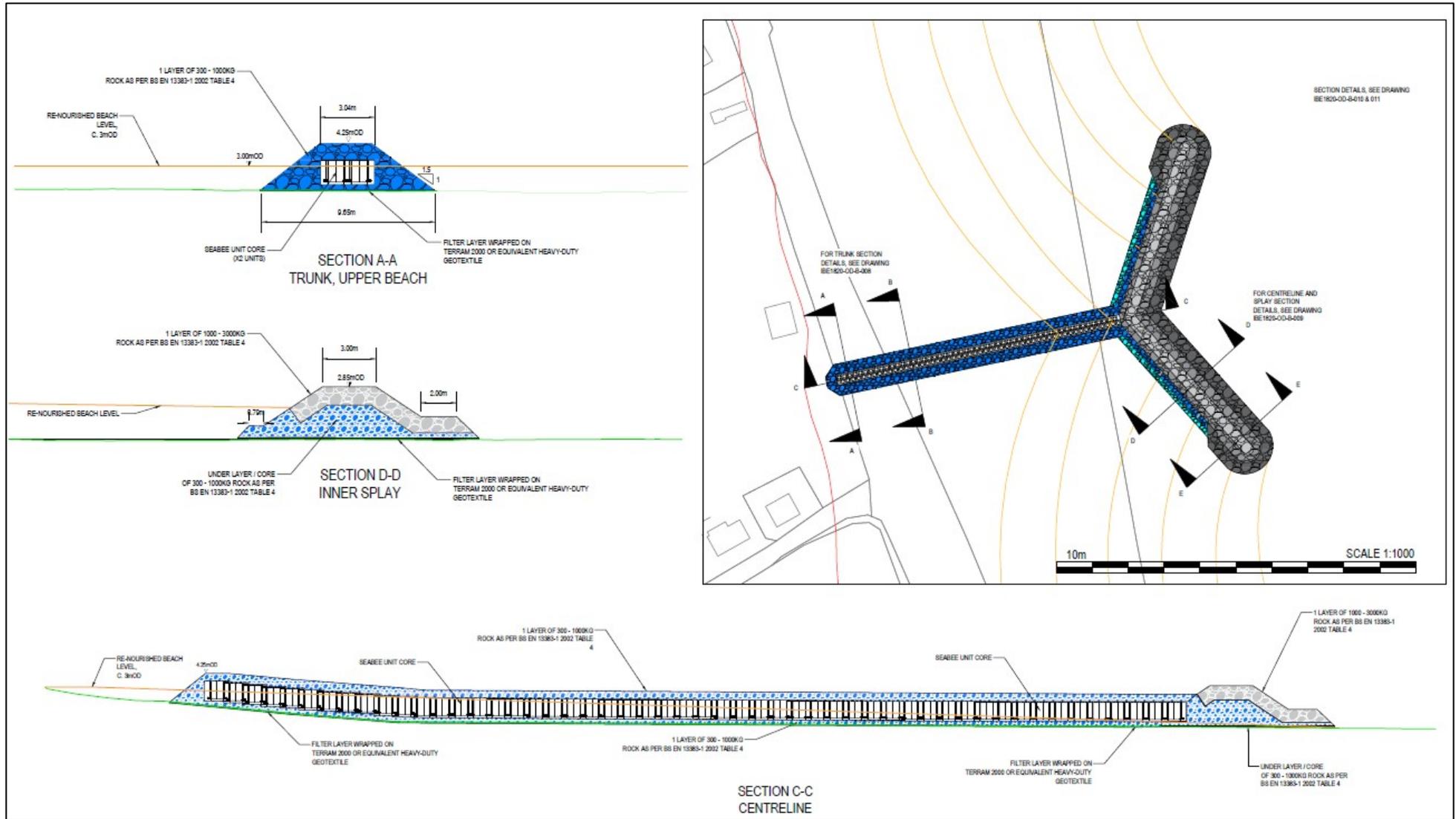


Figure 3.7: Cross section of a typical fish-tail groyne structure and beach nourishment level

## 3.3 Outline Construction Method Statement

The various defence elements of the Proposed Development will likely be delivered over several phases, however, the detail, duration, timing, and programme for each have not yet been confirmed. Key phases are likely to include advance works, construction, operations and future maintenance as outlined below in the following Sections.

### 3.3.1 Advance Works

Advanced works are likely to include, but not be limited to the following:

- Landowner and community liaison, particularly due to the requirement of temporary occupation of gardens at Burrow Road, and the use of roads for access. The progress of the works and working methods should be communicated to residents to avoid complaints, particularly activities such as vibratory piling or compaction.
- Diversion of utilities where required, including a water main and combined sewer, a CCTV camera, and overhead ESB cables.
- Preparation of site compounds – likely on existing made ground in various locations owing to the number of areas requiring coastal defence works. Where possible, storage of materials shall be outside of the SAC and SPA boundaries. Fuel and plant would be stored as per the requirements of the CEMP.
- Fencing of working areas to prevent public access and vandalism.
- Traffic management measures on live roads as necessary.
- Pedestrian traffic management measures/closing off of the area along the beach as necessary.

### 3.3.2 Construction of Flood Embankments

The outline method of construction for the flood embankments of Marsh Lane and Burrow Road is likely to be:

- Install temporary works as required to provide a dry working area,
- Strip and store topsoil for reuse, including removal of any soft spots (depending on the subgrade layer, a separator may have to be placed),
- Remove existing bunds or localised elevated ground features (particularly the existing bluff at Burrow Road),
- Provide temporary haul road as required for access,
- Import and store suitable clay core material by lorry and road. This will be stored within the designated compound areas and brought to required locations using an excavator and dumper,
- Excavate the core trench, place, and compact clay in layers to the sub-formation level,
- Excavate to and grade sub-formation level beyond the footprint, with horizontal benching on relatively flat ground or if necessary, stepping of the profile to resist sliding if the existing ground profile slope is greater than 1 in 5,
- Build-up embankment to crest level in compacted layers using appropriate granular fill to SHW Series 600,

- Trim and profile the shoulders of the slopes to meet the required gradient of 1 to 2.5,
- Place topsoil, sow with grass seed and place a suitable, biodegradable geotextile. The geotextile will protect the embankment from erosion until the establishment of vegetation,
- Excavate and install back drainage at the rear toe of the embankment (see Section 3.3.4),
- Install stock proof fencing as the embankments are to be located or partially located in agricultural land where grazing is likely; to prevent damage to the defences,
- Remove the haul road and reinstate the working area.

### 3.3.3 Construction of the Flood Wall

The outline method of construction for the flood wall at Marsh Lane is likely to be:

- Delivery of piles to the site by articulated lorry or similar along the access route and storage in the appropriate areas shown in drawing IBE1820-OD-B-002 in Appendix A. Piles will need to be stored in the working area before installation,
- Removal of the existing hedgerow between the lane and agricultural field, and establishment of a working area which will facilitate access for dumpers, excavators, concrete lorries and piling rigs. A stoned access route will be established within this area to provide a separate means of access for the residents along Marsh Lane and at the end of Marsh Lane.
- Install temporary works as required on the landside to maintain a minimum flood protection standard during the construction period,
- Establish a stable working platform from which the piling rig can operate. This will partially occupy Marsh Lane itself, in which space is very limited,
- Demolish and remove the existing wall on Marsh Lane, which is in poor condition and is likely to be damaged by vibration impacts,
- Set out the clutch line of piles,
- A crane will hoist piles vertically to be gripped and aligned by the piling rig before being driven to the required depth, and finish at the design top of wall level. A vibratory piling technique will be employed to mitigate noise and vibration impacts, as opposed to percussive methods,
- Construct the concrete capping beam to the top of the piles, involving shuttering, steel fixing and concrete pour,
- Install facing panels or cladding if required to give the appearance of a concrete or masonry wall,
- Excavation and installation of back drainage at the dry side of the piled flood wall,
- Removal and reinstatement of the temporary haul road and working area.

To avoid potential impacts to the nearby Atlantic Salt Meadow habitat in this area, construction plant will not be permitted access to the foreshore with all works instead being undertaken from landside. If necessary, access for labourers to the seaward site of the seawall can be temporarily facilitated by laying bog mats, or similar provisions, at the toe of wall. Bog mats should be lifted and laid with every tidal cycle as necessary.

Other considerations including cladding finish to the wall and coping stone details, connection details between the wall and embankment, and outfall details for the existing culvert under the road will be specified at the detailed design phase.

Drawing IBE1820-OD-B-005 in Appendix A contains details regarding the alignment and form of the proposed flood wall along Marsh Lane.

### 3.3.4 Implementing Back Drainage for Flood Defences

Each of the new flood defences will have some degree of cut-off to prevent excessive flow beneath the defences. Along with the above-ground barrier, this adversely restricts the ability of the land behind the defences to drain post-scheme construction.

To facilitate drainage and ensure the land behind the defences does not become waterlogged, it will be necessary to construct a series of land drains behind the defences. These will consist of perforated pipes bedded in no fines granular material and laid parallel to the defence line at the rear toe. Precast concrete manholes or plastic inspection chambers will be provided at regular intervals to facilitate access for maintenance or changes in direction. At suitable locations, the outfalls of the back drain will discharge to the estuary. The outlet pipework will therefore have to pass either beneath embankments or through walls as applicable, with non-return valves installed to prevent backflow.

In the case of the embankments, the outlet pipework will be laid during embankment construction and will have a "collar" which will key into the clay core and prevent a flow path from forming along the line of the drainage pipe. Careful compaction of clay/shoulder material will also be required to minimise this risk.

In the case of piled walls, outlet pipework will be cored through at suitable locations once they have been installed.

### 3.3.5 Construction of Fishtail Groyne Structures

The construction methodology of each fishtail groyne structure will involve the following:

- All rock armour material which is currently estimated at c. 42,000T (subject to detailed design) will be transported from a quarry (currently anticipated to be at Arklow) using Large Good Vehicles (LGVs) in 20T loads. Upon arrival at the site, material will be offloaded and stored within the adjacent compound facility.
- Material will then be transported from the compound material and placed onto the beach by a suitable-sized excavator / offroad dump truck,
- An excavator/offroad dump truck will be used to place a c. 200mm filter layer and 0.30 – 1.0T rock armour underlayer onto heavy-duty geotextile across the footprint of the groyne trunk, starting landward and working seawards,
- Concrete Seabee units which are already on the beach will be lifted and re-positioned along the groyne trunk in an interlocking fashion using an excavator,
- A single layer of 0.3 – 1.0T rock armour will be placed over the Seabee units at a slope of 1:1.5 using a suitable-sized excavator / offroad dump truck,
- The fishtail sections of the groyne will be constructed in a similar fashion, placing a single layer of primary 1 – 3T rock armour over the bedding and 0.3 – 1.0T underlayer and core layers to achieve the design crest level and elevations using a suitable sized excavator / offroad dump trucks.

The duration of works will be highly dependent on yield production rates at the elected quarry, but assuming material can be stockpiled on site, it is envisaged that each groyne will take c. three weeks to construct (subject to tide and weather conditions).

It is therefore expected to take c.28 working weeks to complete the construction of all seven fishtail groyne structures subject to tidal restrictions and assuming that works can be undertaken outside of normal working hours when required. However, it is envisaged that this work will be undertaken by two squads in a c. 17 week period in order to comply with relevant environmental constraints.

Subject to quarry production rates, it is expected that rock armour will be delivered to the site at an approximate rate of three trucks per hour throughout an anticipated eight-hour working day. This equates to c. 90 days of rock armour related works based on a six-day working week.

### 3.3.6 Beach re-nourishment campaign

Upon completion of the groyne structures, the sub-cell areas will be filled with imported beach nourishment material. The construction methodology for this element is outlined below.

- Supporting equipment required for the beach re-nourishment elements including flanged shore pipeline sections, dry plant and ancillary kit will be transported to the site by road, using approved routes and offloaded within a compound or a secure area at the beach,
- The sinker pipeline will be brought in 12m lengths to a suitable location using road transport, where it will be welded into the required length before being floated and laid on the seabed,
- A mooring point, acting as the connection between the dredger and sinker pipeline will be located on the seabed in a water depth of approximately 10m CD, allowing for the safe mooring of the dredger over all states of the tide, and will consist of a length of floating pipeline connected to the steel 'sinker' pipe positioned on the seabed,
- The sinker pipeline will be connected to the steel shore pipeline on the beach, with additional 12m lengths of pipeline added as the nourishment progresses and the design profile is achieved,
- It is envisaged that a maximum frontage of 650m can be completed before the sinker pipe has to be relocated to a second position to complete the works. This equates to two individual operations to place/move the sinker pipe,
- Upon setup of ancillary equipment as described above, a fully laden trailer suction hopper dredger (TSHD) will sail to Portrane Beach from the licensed nourishment extraction area (presently assumed to be Liverpool Bay),
- Upon arrival, the TSHD will couple to the connection point, fluidise the material within the hopper and pump it to shore,
- Once on the beach, the material will be profiled using GPS-equipped dry plant (dozers), with the shore pipeline extended as each section of the beach is completed. Once discharged the dredger will uncouple and return to the licenced marine excavation area to dredge the next load,

- It is envisaged that the TSHD will operate “non-tidally”, i.e., working in the most efficient manner to reduce losses. This will introduce a requirement for 24hr working on the beach during unloading operations.

Based on a delivery rate of 95,000m<sup>3</sup> per week, it is envisaged that all c.425,000m<sup>3</sup> of material could be transported to Portrane Beach within c. 6 weeks (accounting for losses during the discharge and measurement processes).

## 3.4 Construction Management and Constraints

### 3.4.1 Site Compound and Working Areas

To facilitate the storage of materials and accommodate welfare facilities and site offices it will be necessary to provide sufficient site compounds and working areas within the proximity of the proposed construction works. These would preferably be located adjacent to the main work areas and must be secured adequately. Temporary works will also be required in some areas to prevent the tide from infiltrating the works zone each day during construction.

At Burrow Road, RPS propose the area of land directly south of the proposed embankment location for a site compound. At the Marsh Lane site, the proposed compound area is to the north of the defence with access directly off Burrow Road. These site compound areas and access routes are illustrated in Figure 3.1.

Adequate working room is required to ensure that the Proposed Scheme can be built safely with full consideration of the movement of plant, transportation, and storage of materials.

At Burrow Road, working room within the site is restricted on the dry side of the defence due to the private lands of the residents, with a strip of approx. 4m width alongside the proposed embankment toe. On the seaward side, an offset of 15m from the proposed embankment toe into the estuary has been proposed to minimise encroachment onto the foreshore. Whilst some working within the estuary cannot be avoided, no construction plant will be permitted direct access to the foreshore area. Access for labourers to foreshore can be temporarily facilitated by laying bog mats, or similar provisions. Bog mats should be lifted and laid with every tidal cycle as necessary.

At Marsh Lane, the working area is restricted to the dry side of the proposed defences, in order to limit land take and minimise long-term impacts to the protected salt meadow habitat in the estuary. Whilst some working within the estuary cannot be avoided, no construction plant will be permitted access to the foreshore area seaward of the defence line. Access for labourers to the seaward site of the seawall can be temporarily facilitated by laying bog mats, or similar provisions, at the toe of wall. Bog mats should be lifted and laid with every tidal cycle as necessary.

For the construction of the coastal elements (i.e., groyne structures and beach nourishment), the proposed compound area is within a recreational green space located directly adjacent to Pipers Takeaway. This site has previously been used as a compound and storage area during the construction of the temporary erosion measures that are currently in place on the beach.

As the working areas are greenfield or estuarine in nature, stripping of topsoil or sand deposits and stoning is required as necessary to provide a temporary haul road to facilitate plant movement. Heras fencing panels, or similar as appropriate, will need to be erected as a site security measure for the duration of the works in terrestrial areas. Upon completion of the works, site compounds and temporary working areas will be re-topsoiled and/or reinstated to the existing condition.

### 3.4.2 Access Routes for Construction

All terrestrial plant and materials will be brought to Burrow Road via the R126. This will require plant movements on public roads for the duration of the works and therefore consideration must be given to this in the Contractor's traffic management plan. With appropriate controls and good contractor working practices, this can be achieved without significant risk, but it must be thoroughly considered in terms of construction methodology, timeframes, and cost.

### 3.4.3 Management of Materials and Plant

Within the confines of the working areas, plant movements will be linear in nature. Materials including clay, sheet piles, reinforcement steel, concrete, shuttering, pipework, and topsoil will require transportation up and down these areas from the construction access points, depending on the location of the defence. This may require stoning of these areas to provide adequate haul roads during all weather conditions.

Due to working within the estuary boundary and proximity to properties, it will be necessary to ensure all machinery is in good condition and well maintained to minimise oil leaks and noise to the adjacent properties as far as possible.

There is one location proposed for the storage of materials at each site. These are the site compound areas as illustrated in Figure 3.1. It is envisaged that these will be used for storage of materials that may include topsoil, clay, reinforcement steel, drainage pipes and sheet piles until needed for construction. From there, materials will be transported to the relevant section of defence utilising a range of plant via the constructed haul roads.

In addition to these designated storage areas, it may be necessary to store materials within the working area immediately before using them for construction. The Contractor may also wish to store stripped topsoil in these locations which would reduce the number of site movements associated with double-handling topsoil. However, these activities will be limited as far as reasonably practicable in working areas that lie within the Rogerstown Estuary SAC and SPA boundary, both at Burrow Road and Marsh Lane, furthermore no material storage will take place within vulnerable Annex I habitat associated with the SAC.

### 3.4.4 Working Within the Estuary

Works within Rogerstown Estuary are unavoidable. Temporary works will be required to prevent coastal waters from interacting with works activities throughout the duration of the scheme. The design of temporary work to ensure the method of temporary flood protection is stable and avoids seepage will be the responsibility of the appointed Contractor.

### 3.4.5 Long-Term Operations and Maintenance

Given that the flood elements of the Proposed Scheme are hard defences there are no unusual or specialist maintenance or operational activities envisaged. A description of envisaged maintenance activities for the flood elements of the Scheme is detailed below.

- **Walls** – maintenance associated with these will be minimal. Inspections in accordance with standard asset management procedures are likely to be the main activities. Dealing with vandalism in terms of graffiti or damage to coping stones (if provided) can be an issue.
- **Embankments** – these will need regular inspection and should be mowed at least twice annually to prevent the growth of significant vegetation. Inspection activities will need to look for the presence of animal burrowing or damage from livestock although fencing of the defences, where located within agricultural fields should prevent the latter. Access to embankments is easily achieved for both inspection and maintenance purposes.

- **Drainage elements** – non-return valves will need to be checked regularly to ensure they are working as they form a key aspect of the Scheme function. These will be designed in such a way as to provide safe access. This can be within a manhole on the defended side of the defences rather than at the point of the outfall to the river. Back drainage will need to be checked for blockage and rodded if necessary. Manholes/inspection chambers will be provided to enable this to happen. These manholes will be located on private property including residential gardens and agricultural land.

As the beach nourishment element of the coastal scheme on the beach is predominantly a “soft” nature-based solution, sediment material will be gradually lost from between the groyne structures over time and particularly during storm conditions. As such, beach levels within these cells will gradually reduce over time and require periodic re-nourishment.

Whilst the frequency of re-nourishment will be subject to prevailing weather conditions, the physical characteristics of the nourishment material and the detailed design of the groyne structures, it is expected that the beach will require re-nourishment approximately every 5-10 years. The magnitude of re-nourishment will be subject to the rate of losses during the intervening period but is expected to range between 50 – 75% of the initial nourishment volume.

## **4 STAGE 1 SCREENING APPRAISAL FOR APPROPRIATE ASSESSMENT**

A screening exercise must be undertaken by the competent authority to determine whether, firstly, the plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by the first sentence of Article 6(3).

In addition, the provisions of national legislation, such as Regulation 42 of the 2011 Regulations make clear that screening for appropriate assessment of an application for consent for Proposed Development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Proposed Development, individually or in combination with another plan or project is likely to have a significant effect on the European site.

### **4.1 Directly Connected with or Necessary to the Management of the Site**

The proposed development is proposed by the local authority as a solution to ongoing coastal erosion and flood risk, and primarily intended to provide coastal flood defence to properties at the Burrow, although it will also afford enhanced erosion protection to coastal and shoreline habitats as a result of the measures. As such, the Proposed Development is not considered to be directly connected with or necessary to the management of any European Site.

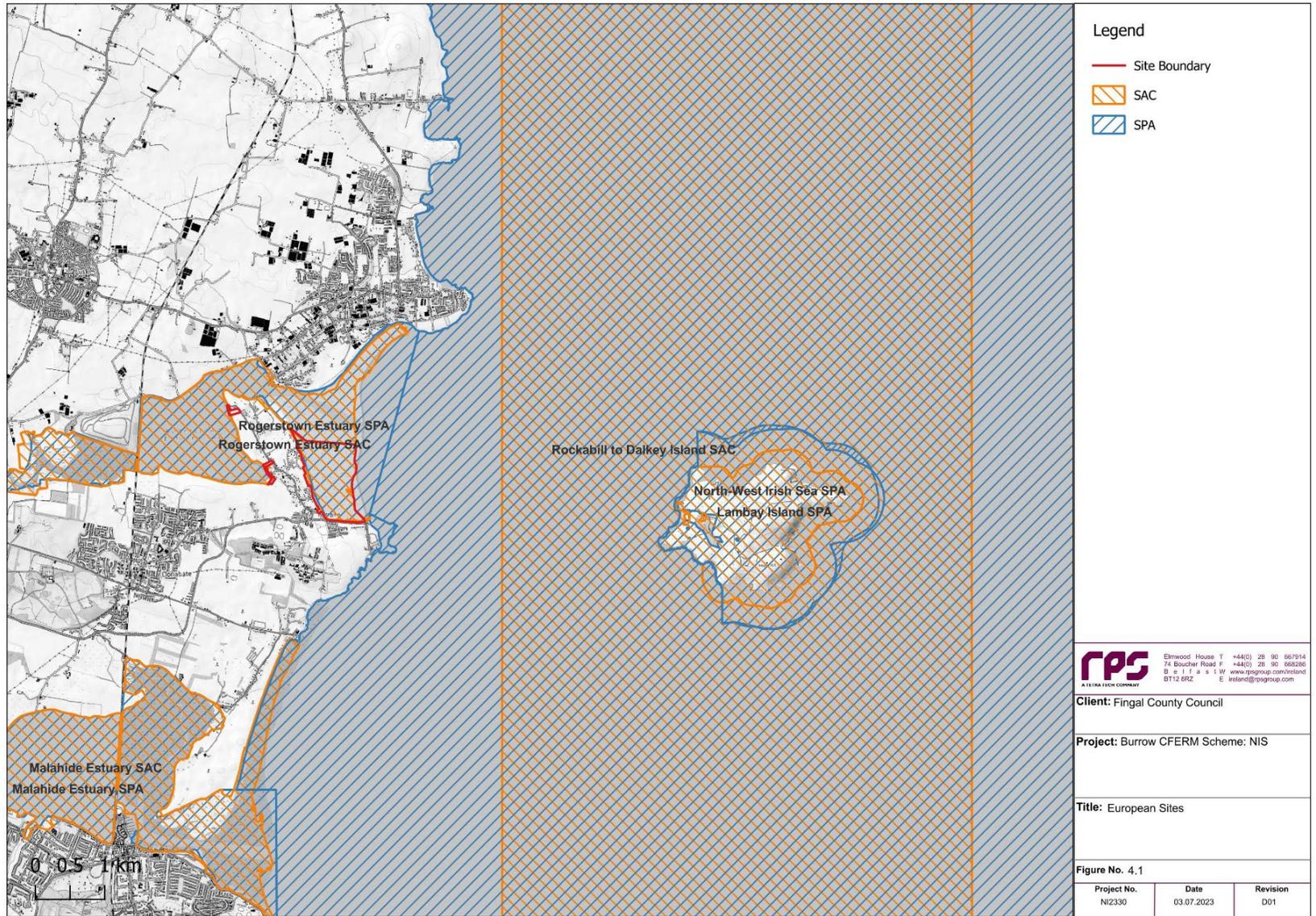
### **4.2 European Sites in proximity to the Proposed Development**

This screening assessment must consider European sites designated under European Council Directives 92/43/EEC and 2009/147/EC. The Proposed Development must be screened against those European sites in order to appraise whether it is likely to have a significant effect on the site.

The most up-to-date Conservation Objectives for the European sites under consideration, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites are provided in Table 4.1.

The information contained in these tables is based on publicly available data on these European Sites and their Conservation Objectives, sourced from NPWS in September 2023.

Relevant candidate SACs ("cSACs"), SACs and SPAs are described in Table 4.1 are illustrated in Figure 4.1.



**Figure 4.1: European Sites considered in the Screening Assessment**

**Table 4.1: Qualifying Interests and Conservation objectives of European sites considered**

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed project																																				
IE000208	Rogerstown Estuary SAC	<p><b>Conservation Objectives Specific Version 1.0 (14/08/13)</b> To maintain the favourable conservation condition of the 7 no. Annex I habitat types in the SAC, as defined by a range of attributes and targets.</p> <p><b>Annex I Habitats</b></p> <ul style="list-style-type: none"> <li>Estuaries [1130]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Hectares</td> <td>The permanent habitat area (268ha) is stable or increasing, subject to natural processes.</td> </tr> <tr> <td>Community Extent</td> <td>Hectares</td> <td>Maintain the extent of the <i>Zostera</i>-dominated community and the <i>Mytilus edulis</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community Structure: <i>Zostera</i> density</td> <td>Shoots/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Zostera</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community structure: <i>Mytilus edulis</i> density</td> <td>Individuals/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Mytilus edulis</i>-dominated community, subject to natural processes</td> </tr> <tr> <td>Community Distribution</td> <td>Hectares</td> <td>Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i>, <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Mudflats and sandflats not covered by seawater at low tide [1140]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Hectares</td> <td>The permanent habitat area (370ha) is stable or increasing, subject to natural processes</td> </tr> <tr> <td>Community Extent</td> <td>Hectares</td> <td>Maintain the extent of the <i>Zostera</i>-dominated community and the <i>Mytilus edulis</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community Structure: <i>Zostera</i> density</td> <td>Shoots/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Zostera</i>-dominated community, subject to natural processes.</td> </tr> <tr> <td>Community structure: <i>Mytilus edulis</i> density</td> <td>Individuals/m<sup>2</sup></td> <td>Conserve the high quality of the <i>Mytilus edulis</i>-dominated community, subject to natural processes</td> </tr> <tr> <td>Community Distribution</td> <td>Hectares</td> <td>Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed</td> </tr> </tbody> </table>	Attribute	Measure	Target	Habitat Area	Hectares	The permanent habitat area (268ha) is stable or increasing, subject to natural processes.	Community Extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the <i>Mytilus edulis</i> -dominated community, subject to natural processes.	Community Structure: <i>Zostera</i> density	Shoots/m <sup>2</sup>	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes.	Community structure: <i>Mytilus edulis</i> density	Individuals/m <sup>2</sup>	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Community Distribution	Hectares	Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed sediment with <i>Tubificoides benedii</i> , <i>Hediste diversicolor</i> and <i>Peringia ulvae</i> community complex.	Attribute	Measure	Target	Habitat Area	Hectares	The permanent habitat area (370ha) is stable or increasing, subject to natural processes	Community Extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the <i>Mytilus edulis</i> -dominated community, subject to natural processes.	Community Structure: <i>Zostera</i> density	Shoots/m <sup>2</sup>	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes.	Community structure: <i>Mytilus edulis</i> density	Individuals/m <sup>2</sup>	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Community Distribution	Hectares	Conserve the following community types in a natural condition: Sand to coarse sediment with <i>Nephtys cirrosa</i> and <i>Scolecopsis squamata</i> community complex; Estuarine sandy mud to mixed	N/A Works will take place within the SAC boundary.
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		<p>Vegetation composition: typical species and sub-communities      Percentage cover at a representative number of monitoring stops      Maintain the presence of species-poor communities dominated by marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>).</p>																												
		<p>Vegetation composition: negative indicator species      Percentage cover      Negative indicator species (including non-natives) to represent less than 5% cover.</p>																												
		<ul style="list-style-type: none"> <li>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</li> </ul>																												
		<table border="1"> <thead> <tr> <th>Attribute</th> <th>Measure</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Habitat Area</td> <td>Hectares</td> <td>Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush – 3.24ha, Portrane – 5.13ha.</td> </tr> <tr> <td>Habitat Distribution</td> <td>Occurrence</td> <td>No decline or change, subject to natural processes.</td> </tr> <tr> <td>Physical structure: functionality and sediment supply</td> <td>Presence/ absence of physical barriers</td> <td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions.</td> </tr> <tr> <td>Vegetation structure: zonation</td> <td>Occurrence</td> <td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.</td> </tr> <tr> <td>Vegetation structure: Bare ground</td> <td>Percentage cover</td> <td>Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.</td> </tr> <tr> <td>Vegetation structure: Sward height</td> <td>Centimetres</td> <td>Maintain structural variation within sward.</td> </tr> <tr> <td>Vegetation composition: typical species and sub-communities</td> <td>Percentage cover at a representative number of monitoring stops</td> <td>Maintain range of sub-communities with typical species listed in Ryle et al. (2009).</td> </tr> <tr> <td>Vegetation composition: negative indicator species (including <i>Hippophae rhamnoides</i>)</td> <td>Percentage cover</td> <td>Negative indicator species (including non-natives) to represent less than 5% cover.</td> </tr> </tbody> </table>	Attribute	Measure	Target	Habitat Area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush – 3.24ha, Portrane – 5.13ha.	Habitat Distribution	Occurrence	No decline or change, subject to natural processes.	Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions.	Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	Vegetation structure: Bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.	Vegetation structure: Sward height	Centimetres	Maintain structural variation within sward.	Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Ryle et al. (2009).	Vegetation composition: negative indicator species (including <i>Hippophae rhamnoides</i> )	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover.	
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		Vegetation composition: scrub/trees Percentage cover No more than 5% cover or under control																
IE004015	Rogerstown Estuary SPA	<p><b>Conservation Objectives Specific Version 1.0 (20/05/13)</b>                      To maintain the favourable conservation condition of –</p> <ul style="list-style-type: none"> <li>• 11 no. overwintering species in the SPA, as defined by 2 no. attributes and targets; and</li> <li>• wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as defined by 1 no. attribute and target.</li> </ul> <p><b>Special Conservation Interests</b></p> <ul style="list-style-type: none"> <li>• Wintering Waterbirds including: Greylag goose (<i>Anser anser</i>) [A043], Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046], Shelduck (<i>Tadorna tadorna</i>) [A048], Shoveler (<i>Anas clypeata</i>) [A056], Oystercatcher (<i>Haematopus ostralegus</i>) [A130], Ringed Plover (<i>Charadrius hiaticula</i>) [A137], Grey Plover (<i>Pluvialis squatarola</i>) [A141], Knot (<i>Calidris canutus</i>) [A143], Dunlin (<i>Calidris alpina</i>) [A149], Black-tailed Godwit (<i>Limosa limosa</i>) [A156] and Redshank (<i>Tringa totanus</i>) [A162].</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Target</th> <th>Measure</th> </tr> </thead> <tbody> <tr> <td>Population trend</td> <td>Percentage change</td> <td>Long term population trend stable or increasing</td> </tr> <tr> <td>Distribution</td> <td>Range, timing and intensity of use of areas</td> <td>There should be no significant decrease in the range, timing or intensity of use of areas by the relevant species other than that occurring from natural patterns of variation.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Wetland and Waterbirds [A999]</li> </ul> <table border="1"> <thead> <tr> <th>Attribute</th> <th>Target</th> <th>Measure</th> </tr> </thead> <tbody> <tr> <td>Wetland habitat area</td> <td>hectares</td> <td>The permanent area occupied by the wetland habitat should be stable and not significantly reduced, other than that occurring from natural patterns of variation.</td> </tr> </tbody> </table>	Attribute	Target	Measure	Population trend	Percentage change	Long term population trend stable or increasing	Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by the relevant species other than that occurring from natural patterns of variation.	Attribute	Target	Measure	Wetland habitat area	hectares	The permanent area occupied by the wetland habitat should be stable and not significantly reduced, other than that occurring from natural patterns of variation.	N/A Works will take place within the SPA boundary
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IE004236	North-West Irish Sea cSPA	<p><b>Conservation Objectives yet to be published.</b></p> <ul style="list-style-type: none"> <li>• Common Scoter (<i>Melanitta nigra</i>) [A065]</li> <li>• Red-throated Diver (<i>Gavia stellata</i>) [A001]</li> <li>• Great Northern Diver (<i>Gavia immer</i>) [A003]</li> <li>• Fulmar (<i>Fulmarus glacialis</i>) [A009]</li> <li>• Manx Shearwater (<i>Puffinus puffinus</i>) [A013]</li> <li>• Shag (<i>Phalacrocorax aristotelis</i>) [A018]</li> <li>• Cormorant (<i>Phalacrocorax carbo</i>) [A017]</li> <li>• Little Gull (<i>Larus minutus</i>) [A177]</li> </ul>	0.25km															

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed project																		
		<ul style="list-style-type: none"> <li>• Kittiwake (<i>Rissa tridactyla</i>) [A188]</li> <li>• Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>• Common Gull (<i>Larus canus</i>) [A182]</li> <li>• Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]</li> <li>• Herring Gull (<i>Larus argentatus</i>) [A184]</li> <li>• Great Black-backed Gull (<i>Larus marinus</i>) [A187]</li> <li>• Little Tern (<i>Sterna albifrons</i>) [A195]</li> <li>• Roseate Tern (<i>Sterna dougallii</i>) [A192]</li> <li>• Common Tern (<i>Sterna hirundo</i>) [A193]</li> <li>• Arctic Tern (<i>Sterna paradisaea</i>) [A194]</li> <li>• Puffin (<i>Fratercula arctica</i>) [A204]</li> <li>• Razorbill (<i>Alca torda</i>) [A200]</li> <li>• Guillemot (<i>Uria aalge</i>) [A199]</li> </ul>																			
IE003000	Rockabill to Dalkey Island SAC	<p><b>Conservation Objectives Specific Version 1.0 (07/05/13)</b>                      To maintain the favourable conservation condition of the one no. Annex I habitat type in the SAC, as defined by three no. attributes and targets; and a single Annex II species in the SAC, as defined by two no. attributes and targets.</p> <p><b>Annex I Habitats</b></p> <ul style="list-style-type: none"> <li>• Reefs [1170]</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Attribute</th> <th style="text-align: left;">Measure</th> <th style="text-align: left;">Target</th> </tr> </thead> <tbody> <tr> <td>Habitat area</td> <td>Hectares</td> <td>The permanent area stable or increasing, subject to natural processes.</td> </tr> <tr> <td>Habitat distribution</td> <td>Occurrence</td> <td>No decline, subject to natural processes.</td> </tr> <tr> <td>Community structure</td> <td>Biological composition</td> <td>Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.</td> </tr> </tbody> </table> <p><b>Annex II Species</b></p> <ul style="list-style-type: none"> <li>• <i>Phocoena phocoena</i> (Harbour Porpoise) [1351]</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Attribute</th> <th style="text-align: left;">Measure</th> <th style="text-align: left;">Target</th> </tr> </thead> <tbody> <tr> <td>Access to suitable habitat</td> <td>Number of artificial barriers</td> <td>Species range within the site should not be restricted by artificial barriers to site use.</td> </tr> </tbody> </table>	Attribute	Measure	Target	Habitat area	Hectares	The permanent area stable or increasing, subject to natural processes.	Habitat distribution	Occurrence	No decline, subject to natural processes.	Community structure	Biological composition	Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.	Attribute	Measure	Target	Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	2.0km
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		<p>Vegetation composition: typical species and sub-communities      Percentage cover at a representative sample of monitoring stops      Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).</p>																			
		<p>Vegetation composition: negative indicator species      Percentage      Negative indicator species (including non-natives) to represent less than 5% cover.</p>																			
		<p>Vegetation composition: bracken and woody species      Percentage      Cover of bracken (<i>Pteridium aquilinum</i>) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%.</p>																			
		<p><b>Annex II Species</b></p> <ul style="list-style-type: none"> <li>• Grey seal (<i>Halichoerus grypus</i>) [1364]</li> </ul>																			
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IE000204	Lambay Island SPA	<p><b>Conservation Objectives Specific Generic (12/10/22)</b>                      To maintain or restore the favourable conservation condition of 10 no. bird species listed as special conservation interests in the SPA including:</p> <ul style="list-style-type: none"> <li>• Fulmar (<i>Fulmarus glacialis</i>) [A009] - Breeding;</li> <li>• Cormorant (<i>Phalacrocorax carbo</i>) [A017] - Breeding;</li> <li>• Shag (<i>Phalacrocorax aristotelis</i>) [A018] - Breeding;</li> <li>• Greylag goose (<i>Anser anser</i>) [A043] – Wintering;</li> <li>• Lesser black-backed gull (<i>Larus fuscus</i>) [A183] – Breeding;</li> <li>• Herring gull (<i>Larus argentatus</i>) [A184] – Breeding;</li> <li>• Kittiwake (<i>Rissa tridactyla</i>) [A188] – Breeding;</li> <li>• Guillemot (<i>Uria alalge</i>) [A199] – Breeding;</li> <li>• Razorbill (<i>Alca torda</i>) [A200] – Breeding; and</li> <li>• Puffin (<i>Fratercula arctica</i>) [A204] – Breeding.</li> </ul>	4.2km
IE004014	Rockabill SPA	<p><b>Conservation Objectives Specific Version 1.0 (08/05/13)</b>                      To maintain the favourable conservation condition of –</p> <ul style="list-style-type: none"> <li>• One no. overwintering species in the SPA, as defined by 2 no. attributes and targets; and</li> <li>• Three no. breeding tern species in the SPA, as defined by 6 no. attributes and targets.</li> </ul> <p><b>Special Conservation Interests</b></p> <ul style="list-style-type: none"> <li>• Purple sandpiper (<i>Calidris maritima</i>) [A148]</li> </ul>	7.5

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<ul style="list-style-type: none"> <li>Common tern (<i>Sterna hirundo</i>) [A193]</li> </ul>																																																
Attribute	Measure	Target																																														
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline.																																														
Productivity rate: fledged young per breeding pair	Mean number	No significant decline.																																														

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed project																					
		<table border="1"> <tr> <td>Distribution: Breeding colonies</td> <td>Number, location, area (ha)</td> <td>No significant decline.</td> </tr> <tr> <td>Prey biomass available</td> <td>Kilograms</td> <td>No significant decline.</td> </tr> <tr> <td>Barriers to connectivity</td> <td>Number, location, shape, area (ha)</td> <td>No significant increase.</td> </tr> <tr> <td>Disturbance at breeding site</td> <td>Level of impact</td> <td>Human activities should occur at levels that do not adversely affect the breeding common tern population.</td> </tr> </table>	Distribution: Breeding colonies	Number, location, area (ha)	No significant decline.	Prey biomass available	Kilograms	No significant decline.	Barriers to connectivity	Number, location, shape, area (ha)	No significant increase.	Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population.										
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## 4.3 Establishing an Impact Pathway

The possibility of significant effects is considered in this SISAA report using the source-pathway-receptor model. 'Source' is defined as the individual elements of the proposed works that have the potential to affect the identified ecological feature (or receptor). 'Pathway' is defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' is defined as the Special Conservations Interests (for SPAs) or Qualifying Interests (of SACs/cSACs) for which conservation objectives have been set for the European sites under consideration (refer to Table 4.1). Each element can exist independently however an effect is created when there is a linkage between the source, pathway and receptor. Possible effects are discussed under four themes:

- Habitat loss;
- Water quality and habitat deterioration;
- Altered coastal processes;
- Underwater noise and disturbance; and
- Aerial noise and visual disturbance.

## 4.4 Potential Effects

### 4.4.1 Habitat Loss

The proposed work areas lie within two European sites, namely the Rogerstown Estuary SAC and the Rogerstown Estuary SPA. The work areas also lie in proximity a number of further European sites including the Rockabill to Dalkey island SAC, Lambay Island SAC, Lambay Island SPA and the Rockabill SPA.

#### 4.4.1.1 Rogerstown Estuary SAC

The Proposed Development at the Burrow will involve the construction of a 190m long embankment at the end of Burrow Road and the construction of a 130m long sheet-piled flood wall and 200m embankment along Marsh Lane. These works will largely take place within the terrestrial environment. A large proportion of the proposed wall and embankment length lies within the boundary of the Rogerstown Estuary SAC. This includes areas of scrub, recolonising hardstanding, hardstanding, areas of dense bracken and largely dry meadows / grassy verges habitat which lie along the western shore of the Burrow. In addition, areas of Annex I saltmarsh, perennial vegetation of stony banks and intertidal mud and sandflats and estuarine habitats of which Atlantic salt meadows [1330], mudflats and sandflats not covered by sea water at low tide [1140] and Estuaries [1130] are included as qualifying interests of the SAC and will be affected by the proposed flood wall and embankments on the western shore of the Burrow.

The Proposed Development will also involve the construction of seven fishtail groynes along a 1.3km length of the western coastline of the Burrow and associated beach renourishment. The footprint of these structures will be within areas of intertidal mudflats and estuarine habitat, with some limited areas of shingle and gravel banks which are representative of Annex I habitat: 1220 Perennial vegetation of stony banks. All areas of mixed sediment shores and intertidal estuarine habitat are considered to be representative of mudflats and sandflats not covered by sea water at low tide [1140] and Estuaries [1130] which are included as qualifying interests of the SAC.

Areas of Annex I habitat within the footprint of the proposed flood walls, embankments, fishtail groynes and beach renourishment will be permanently lost as a result of the construction. Further areas of the habitat are likely to be temporarily lost or adversely impacted as a result of temporary construction effects within the proposed working area, which is considerably larger than the delivered footprint of the proposed infrastructure.

Table 4.2 sets out approximate areas of each Annex I habitat which represents a qualifying interest of the Rogerstown Estuary SAC which will be affected permanently and temporarily as a result of the construction phase of the Proposed Development.

Table 4.2: Construction Phase Impacts to Rogerstown Estuary Qualifying Annex I Habitats

Annex I Habitat	Approximate Development Footprint: Permanent Loss (ha)	Approximate Working Area: Temporary Impacts (ha)	Total Area Within the SAC Conservation Objectives (2013) (ha)	Percentage Area Permanently Affected [Temporarily Affected] (%)
Atlantic Salt Meadows (1330)	0.00016	0.18	37.2	0.00043 [0.48]
Mediterranean Salt Meadows (1410)	-	0.006	2.18	- [2.18]
Mudflats and sandflats not covered by seawater at low tide (1140)	1.36	13.01	370	0.37 [3.52]
Estuaries (1130)	-	-	268	-
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	-	0.02	2.56	- [0.78]
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	-	0.79	8.37	- [9.44]
Annual vegetation of drift lines [1210] (Non-qualifying)	0.0006	0.34	-	-
Perennial vegetation of stony banks [1220] (Non-qualifying)	-	0.062	-	-
Embryonic shifting dunes [2110] (Non-qualifying)	-	-	-	-

On the basis of the information presented in Table 4.2, it is envisaged that the Proposed Development will give rise to permanent loss or temporary adverse impacts to significant areas of Annex I habitats which are qualifying interests of the SAC. It is noted that the majority of the areas of intertidal mudflat set out as potentially subject to temporary impacts, lying within the proposed working area, will not be subject to any particular effects with these portions of the working area representing the areas in which the dredge vessel and associated sinker pipeline for beach renourishment will be temporarily located.

Likely significant effects upon the Rogerstown Estuary SAC as a result of habitat loss therefore cannot be excluded at the screening stage.

#### **4.4.1.2 Rogerstown Estuary SPA**

The boundary of the Rogerstown Estuary SPA is largely concurrent with that of the Rogerstown Estuary SAC and as such it is envisaged that impacts to habitats which underpin the value of the SPA site for birds will be broadly consistent with those predicted in respect of that site.

As set out above, in respect of the Rogerstown Estuary SAC, the proposals will give rise to temporary and permanent losses to areas of saltmarsh and intertidal mud and sand flat habitat, which would also result in an overall decrease to the available areas of foraging and roosting habitat for the SCI bird populations of the SPA.

Likely significant effects upon the Rogerstown Estuary SPA as a result of habitat loss therefore cannot be excluded at the screening stage.

#### **4.4.1.3 Other European Sites**

The Proposed Development will not involve works within any further European sites which lie within relative proximity to the proposed working area including the North-Irish Sea cSPA, Rockabill to Dalkey Island SAC, Lambay Island SAC, Lambay Island SPA or Rockabill SPA.

Likely significant effects upon any of these European sites as a result of habitat loss can be excluded at the screening stage. This is the case in the absence of mitigation measures.

### **4.4.2 Water Quality and Habitat Deterioration**

The proposed development, which will involve significant works within and in close proximity to areas of marine and intertidal habitat, will have potential to give rise to water quality and habitat deterioration effects upon aquatic habitats and associated species during the construction phase of the Proposed Development.

#### **4.4.2.1 Rogerstown Estuary SAC**

The Proposed Development will involve significant works within QI intertidal and marine habitats within the SAC. These include the creation of a flood embankment and the construction of groynes and associated beach nourishment.

These works will give rise to the risk of pollution and sedimentation effects upon the aquatic environment arising through the use of construction equipment within and in proximity to marine and intertidal habitats, the use of concrete and other substrates in the construction of embankments and flood walls and the storage of such materials, petrochemical fuels and other potential pollutant substances within proximity to the proposed work areas.

The proposed beach renourishment process will involve the pumping of large quantities of sand “slurry” mixture to within the delivered groyne structures. These activities are predicted to give rise to sediment plumes within the adjacent marine and intertidal waters, arising largely from the initial pumping of this material while in suspension, prior to quick settlement on the shore or seabed.

Likely significant effects upon the Rogerstown Estuary SAC as a result of water quality and habitat deterioration effects therefore cannot be excluded at the screening stage.

#### **4.4.2.2 Rogerstown Estuary SPA**

As set out above, the Proposed Development will have potential to give rise to significant water quality and habitat deterioration effects upon intertidal and marine habitats within the Rogerstown Estuary SAC, which shares a largely concurrent boundary with the SPA.

It is considered that such potential effects would also have potential to give rise to significant effects upon the food resources of SCI bird populations of the SPA, in addition to limited potential for environmental toxicity and displacement effects.

Likely significant effects upon the Rogerstown Estuary SPA as a result of water quality and habitat deterioration effects therefore cannot be excluded at the screening stage.

#### **4.4.2.3 North-West Irish Sea cSPA**

The Proposed Development will involve works within the marine environment within relative proximity (within 250m) of the North-West Irish Sea cSPA.

It is considered that while some significant dilution of pollutants, contaminants and sediment plumes arising as a result of the proposed works would occur within intervening areas of marine waters there is insufficient certainty that such dilution effects would be sufficient to rule out potential significant effects upon the cSPA.

Likely significant effects upon the North-West Irish Sea cSPA as a result of water quality and habitat deterioration effects therefore cannot be excluded at the screening stage.

#### **4.4.2.4 Rockabill to Dalkey Island SAC**

The Proposed Development will involve works within the marine environment within relative proximity to the Rockabill to Dalkey Island SAC. It is noted however that this designated site is separated from the Proposed Development by 2km of marine waters within the Irish Sea.

On that basis it is considered that the proposals, would only have potential to give rise to relatively localised water quality and habitat deterioration effects associated with construction phase works, this would have no potential to give rise to any likely significant or even measurable changes to water quality within the boundary of the SAC.

The SAC is partially designated on account of the supported populations of mobile harbour porpoise. While populations of this QI species could be present within areas of marine habitat within relative proximity to the proposed development, there is no evidence to suggest that these areas are of particular importance for this species and they are likely to be present in these areas on an occasional basis only, however on a precautionary basis the potential for significant effects has not been ruled out.

Likely significant effects upon the Rockabill to Dalkey Island SAC as a result of water quality and habitat deterioration effects therefore cannot be excluded at the screening stage.

#### **4.4.2.5 Rockabill SPA**

The Proposed Development, which is separated from the SPA by a significant length of marine waters of the Irish Sea, would not have potential to give rise to any significant water quality and habitat deterioration effects within the boundary of the SPA boundary itself. It is noted however that areas of estuarine and marine waters in close proximity to the proposed working area are utilised by foraging populations of terns which are considered likely to represent individuals associated with the Rockabill SPA which is well within the known mean foraging ranges for each of these species (Woodward et al. 2019). These foraging populations of terns utilise areas which are within close proximity to the proposed working area and as such may be potentially affected by water quality and habitat deterioration effects arising as a result of the Proposed Development, including sediment plumes associated with proposed beach nourishment.

Likely significant effects upon the Rockabill SPA as a result of water quality and habitat deterioration effects therefore cannot be excluded at the screening stage.

#### **4.4.2.6 Other European Sites**

The Proposed Development will be significantly spatially and hydrologically separated from other European Sites within the wider area. It is not considered that the proposed development will have any potential to give rise to measurable impacts upon these more distant European Sites.

Likely significant effects upon further European Sites, including the Lambay Island SPA and SAC, as a result of water quality and habitat deterioration effects are excluded at the screening stage.

### **4.4.3 Underwater Noise and Disturbance**

As described in Section 3, some aspects of the Proposed Development will require activities in the marine environment including activities producing underwater noise, including: sheet piling to construct the proposed

flood wall in proximity to Marsh Lane and the construction of proposed groyne structures and the movement and use of a dredge vessel within the marine environment within the proposed working area.

These activities carry a very small inherent risk of noise induced effects upon some marine species as a result of underwater acoustic energy being released into the marine environment. The purpose of the screening assessment is to determine whether or not such risks can be excluded.

It is noted that QI Annex I habitats are not sensitive to effects associated with underwater noise and vibration, as such it is considered that there is no potential for the Proposed Development to give rise to likely significant effects upon the Rogerstown Estuary SAC, as a result of underwater noise or vibration. Furthermore such effects are highly localised and have no potential to act on distant European Sites including the Lambay Island SPA and other more distant SACs and SPAs.

Underwater noise is not a persistent effect, and once the noise source ceases noise levels drop very quickly to pre-existing levels. The natural underwater soundscape of the Rogerstown Estuary and adjacent areas of Irish Sea is not silent - biological sounds from fish and marine mammals are mixed with sounds from waves and surface noise; current flow and turbulence; rain and wind/storm noise; and noise from shipping and leisure craft activities. The ambient noise levels in coastal and inshore water, bays and harbours are subject to huge variation.

While the Proposed Development may give rise to underwater noise and vibrational effects associated with the installation of sheet piled flood walls in proximity to the estuary, it is considered that intervening bedrock, mud and other overburden would give rise to significant attenuation of such effects. It is considered unlikely that appreciable levels of underwater noise or vibration would arise as a result of the proposals sufficient to create disturbance to SCI bird populations associated with the Rogerstown Estuary SPA. All such SCI birds are not species which spend significant periods underwater and as such are considered to be fairly oblivious to the effects of activities generating underwater noise. There is a lack of scientific understanding of the use of underwater sound by diving birds and the extreme lack of scientific data on the underwater hearing capabilities of such birds, with evidence of responses to underwater auditory stimuli in birds being only recently discovered (Hansen et. al 2017). Given the lack of evidence indicating strong behavioural responses in birds to underwater auditory stimuli it is considered that this group are likely to be fairly resilient to such effects.

On the basis of the above it is considered that the Proposed Development would not give rise to likely significant underwater noise or vibrational disturbance effects upon the Rogerstown Estuary SPA or any further SPAs within the wider area, for which the above rationale applies.

#### **4.4.3.1 Rockabill to Dalkey Island SAC**

Rockabill to Dalkey Island SAC is designated on account of the supported areas of Annex I habitat: Reefs in addition to the supported populations of Annex II species: harbour porpoise.

Populations of harbour porpoise for which the site is designated are known to occur throughout the SAC. Harbour porpoise are also likely to be present within marine habitat in close proximity to the proposals, including within the estuary and close to the western shore of the Burrow on at least an occasional basis. Records of harbour porpoise held by NBDC include 13 records from within the bay between Rush and Portrane, the most recent of which being from 2020. No records are held by NBDC for the species from within the estuary itself.

The Proposed Development will involve works with significant potential to give rise to underwater noise and vibrational disturbance to estuarine waters which may occasionally support the species, principally through proposed sheet piling which will be used to construct the proposed sea wall at Marsh Lane, in addition to noise associated with the movement and use of dredge equipment required in order to facilitate beach renourishment works.

Harbour Porpoise use sound for foraging, navigation, social activities and predator detection. Changes in underwater noise therefore have the potential to interrupt these behaviours. The peak frequency of echolocation pulses produced by Harbour Porpoise is 120–130kHz, corresponding to their peak hearing sensitivity although hearing occurs throughout the range of ~1 and 180kHz (Southall et al 2007). A range of activities emit sound that falls within the hearing sensitivities of porpoise, including shipping, pile driving, Acoustic Deterrent Devices (ADDs) and military activities. The exact frequency, intensity and longevity of the sound will determine the

response. The impact on the porpoise is also mediated through individual behaviour, and perhaps quality of its immediate habitat, at the time of exposure.

In the absence of further information it is considered that the Proposed Development has potential to give rise to significant adverse impacts to harbour porpoise populations of the Rockabill to Dalkey Island SAC through underwater noise and vibrational disturbance.

Likely significant effects upon the Rockabill to Dalkey Island SAC as a result of underwater noise and vibrational effects therefore cannot be excluded at the screening stage.

#### **4.4.3.2 Lambay Island SAC**

The Lambay Island SAC is designated on account of the supported populations of seal including grey seal *Halichoerus grypus* and harbour seal *Phoca vitulina* and is separated from the Proposed Development by 4.2km of marine waters.

Grey and harbour seals have been recorded as largely tolerant to underwater noise (J. Parsons in G.D. Green et al. 1985) with pinnipeds generally being resilient to the effects of regular high intensity underwater noise with localised avoidance recorded in association with underwater noise of up to and greater than 190dB (Harris et al. 2001).

Seals are known to utilise the estuary and marine waters within proximity to the Proposed Development on an occasional basis (with a total of two records of grey seal and a single record of common seal held by NBDC. Furthermore seals were recorded within the estuary on a few occasions during bird surveys undertaken of the site. It is considered likely that these seals are associated with the Lambay Island SAC.

On the basis that these species are not known to be particularly sensitive to the effects of underwater noise and vibration, in addition to the relatively limited effects which are to predicted to arise as a result of the Proposed Development it is considered that there will be no significant effects of underwater noise and vibration effects upon the Lambay Island SPA will occur.

Likely significant effects upon the Lambay Island SAC as a result of underwater noise and visual effects therefore can be excluded at the screening stage in the absence of further analysis or the application of mitigation measures.

#### **4.4.4 Aerial Noise and Visual Disturbance**

As described in Section 3, some aspects of the Proposed Development will require activities producing aerial noise and visual disturbance including the movement of plant and construction operatives to construct proposed flood wall in proximity to Marsh Lane and the construction of proposed groyne structures and the movement and use of a dredge vessel within the marine environment within the proposed working area.

These activities carry a potential risk of giving rise to disturbance and displacement effects upon sensitive qualifying interests of nearby European Sites. The purpose of the screening assessment is to determine whether or not such risks can be excluded.

It is noted, as set out above in respect of underwater noise and vibration, that QI Annex I habitats are not sensitive to effects associated with aerial noise and visual disturbance, as such it is considered that there is no potential for the Proposed Development to give rise to significant effects upon the Rogerstown Estuary SAC, via such effects. Furthermore such effects are highly localised and have no potential to act on distant European Sites including the Lambay Island SAC and other more distant SACs and SPAs with the exception of where mobile QI or SCI species which live above the water line and utilise the site or its surroundings as functionally linked habitat.

Given the aquatic nature of the Annex II QI species for which a number of nearby European sites are designated, it is considered that the Proposed Development would have no potential to give rise to significant aerial noise and visual disturbance effects upon either the Rockabill to Dalkey Island SAC or Lambay Island SAC both of which are designated on account of the supported marine mammal populations which are not considered to be vulnerable to the effects of aerial noise and visual disturbance.

#### 4.4.4.1 Rogerstown Estuary SPA

Surveys undertaken to inform this application have shown that areas of the Rogerstown Estuary SPA within close proximity to the proposed working area, are of importance to wintering SCI bird populations in variable but relatively high numbers including significant proportions of the SPA populations. Aerial noise or visual disturbance within the working area would have potential to give rise to construction phase disturbance and subsequent displacement of bird populations within the SPA. Longer term disturbance within the proposed works area would however give rise to an effective temporary loss of the relevant areas for wintering bird populations, with potential for such effects to act in-combination with other sources of disturbance across the wider estuary.

Likely significant effects upon the Rogerstown Estuary SPA as a result of noise and visual effects therefore cannot be excluded at the screening stage.

#### 4.4.4.2 North-West Irish Sea cSPA

The North-West Irish Sea cSPA is designated on account of a range of supported wintering and breeding bird populations of foraging seabirds which have potential to be present foraging within the proposed working area. Surveys undertaken to inform this application have shown that areas of marine habitat in close proximity to the proposed working area do support occasional use by SCI species of this cSPA, for foraging and loafing.

Likely significant effects upon the Lambay Island SPA as a result of noise and visual effects therefore cannot be excluded at the screening stage, in the absence of further analysis or the application of mitigation measures.

#### 4.4.4.3 Rockabill SPA

Surveys undertaken to inform this application have shown that areas of marine habitat within close proximity to the proposed working area, are of importance to foraging tern populations which are a breeding SCI of the nearby Rockabill SPA, in variable and relatively low numbers. These birds are considered to represent individuals which originate within or are otherwise associated with the SPA populations as the site lies well within the known mean foraging ranges for each of the respective tern species, Roseate Tern, Common Tern and Arctic Tern ((Woodward et al. 2019).

Likely significant effects upon the Rockabill SPA as a result of noise and visual effects therefore cannot be excluded at the screening stage, in the absence of further analysis or the application of mitigation measures.

#### 4.4.4.4 Lambay Island SPA

Lambay Island SPA is designated on account of a range of supported wintering and breeding bird populations which have potential to be present foraging within the proposed working area. Surveys undertaken to inform this application have shown that areas of marine habitat in close proximity to the proposed working area do support occasional use by SCI species of this SPA, for foraging and loafing.

Likely significant effects upon the Lambay Island SPA as a result of noise and visual effects therefore cannot be excluded at the screening stage, in the absence of further analysis or the application of mitigation measures.

### 4.5 In-Combination Effects

Article 6(3) of the Habitats Directive and Irish national law requires that in-combination effects with other plans or projects are considered. The significance of any identified combined effects of the proposed development and other past, present or reasonably foreseeable future plans or projects must also be evaluated. On this basis, the planning portal for Fingal County Council and the An Bord Pleanála portal were searched for other projects within the locality with potential to act in-combination with the Proposed Development.

No developments with potential to act in-combination with the Proposed Development were noted with the exception of the parallel application for proposed coastal defence measures at the Rush site, on the other side of the Estuary (north side) from the Proposed Development.

### 4.5.1 Rush: Coastal Defence Scheme

The Proposed Development (the Burrow CFERM scheme) has been designed, assessed and submitted for development consent in parallel to another application for a proposed coastal defence scheme at Rush. The Rush scheme will also involve significant works taking place within the boundary of the Rogerstown Estuary SAC and Rogerstown Estuary SPA.

The Proposed Development at Rush (the Rush CFERM scheme) is split into three areas: along Channel Road and South Shore Road and also within the Linkside area. The Rush CFERM scheme consists of the following main elements:

- Construction of a c.1,055m long flood wall between the western extent of Channel Road and along South Shore Road.
- A c.30m long blockwork wall to consolidate the flood protection between the western extent of Channel Road and the last residential property in this area.
- An alteration of existing ground levels at the western extent of Channel Road to consolidate flood protection and to facilitate the potential future development of a cycle path between Rush and Balleally.
- Provision for flood gates / vehicular / pedestrian access at c.8 locations
- Potential utility diversions

Predicted impacts arising as a result of the proposed Rush CFERM scheme includes loss of small areas of qualifying interest habitats of the SAC including intertidal estuarine and mudflat habitats and small areas of Atlantic and Mediterranean salt meadows, at construction phase. Significant operational phase impacts to SCI habitats are not predicted to occur.

It is considered therefore that the Rush CFERM scheme would have potential to act in combination with the Burrow CFERM scheme in respect of all habitat loss effects predicted for Rogerstown Estuary SAC.

In regard to the Rogerstown Estuary SPA, cumulative loss of habitats within the SPA boundary, as discussed above in respect of the SAC, will give rise to synchronous loss of foraging habitat for wintering SCI bird populations. Associated in combination effects are thus predicted to arise for Rogerstown Estuary SPA as a result of the Rush CFERM scheme acting in combination with the Burrow CFERM scheme.

Furthermore, aerial noise and visual disturbance effects upon SCI bird populations of Rogerstown Estuary SPA will occur as a result of both schemes, in the absence of mitigation. This disturbance and associated displacement would also have potential to act cumulatively if the schemes were constructed concurrently and consequently give rise to a relatively greater cumulative disturbance and displacement effect with a greater limitation on the available undisturbed area of habitat for wintering populations of SCI bird species.

Other potential indirect impacts upon the Rogerstown Estuary SAC and SPA including water quality and habitat deterioration effects also have potential to act cumulatively with the Proposed Development.

Underwater noise and vibrational effects, associated with proposed flood wall construction for both schemes also has potential to act cumulatively.

## 4.6 Summary of Screening Appraisal

Table 4.3 summarises the outcome of the screening exercise for each European site considered.

Table 4.2: Screening Summary for European sites considered

Site Code	Site Name	Can the possibility of Likely Significant Effects be excluded at the Screening Stage of assessment?			
		Habitat Loss	Water Quality and Habitat Deterioration	Underwater Noise and Disturbance	Aerial Noise and Visual Disturbance
IE000208	Rogerstown Estuary SAC	✓	✓	✗	✗
IE004015	Rogerstown Estuary SPA	✓	✓	✗	✓
IE004236	North-West Irish Sea cSPA	✗	✓	✗	✓
IE003000	Rockabill to Dalkey Island SAC	✗	✓	✓	✗
IE000206	Lambay Island SAC	✗	✗	✗	✗
IE000204	Lambay Island SPA	✗	✗	✗	✓
IE004014	Rockabill SPA	✗	✓	✗	✓

## 5 NEXT STEPS

It is intended that the information presented in this SISAA shall be used by the Competent Authority to undertake a screening for appropriate assessment in accordance with the 2000 Act to assess, in view of best scientific knowledge, if that proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site.

From the information presented, this SISAA report has concluded that the possibility of likely significant effects upon six of the European sites scoped into the appraisal cannot be excluded in the absence of further evaluation and analysis and quite likely the application of mitigation measures, as a result of the proposed project alone and in combination with the other projects considered. This is summarised below:

- The possibility of likely significant **Habitat Loss** cannot be excluded for the Rogerstown Estuary SAC and Rogerstown Estuary SPA without further evaluation and analysis.
- The possibility of likely significant **Water Quality and Habitat Deterioration** cannot be excluded for the Rogerstown Estuary SAC, Rogerstown Estuary SPA, North-West Irish Sea cSPA, Rockabill to Dalkey Island SAC and Rockabill SPA without further evaluation and analysis.
- The possibility of likely significant **Underwater Noise and Disturbance** cannot be excluded for the Rockabill to Dalkey Island SAC without further evaluation and analysis.
- The possibility of likely significant **Aerial Noise and Visual Disturbance** cannot be excluded for the Rogerstown Estuary SPA, North-West Irish Sea cSPA, Lambay Island SPA and Rockabill SPA without further evaluation and analysis.

Having regard to the methodology employed and the findings, it is concluded that an appropriate assessment of the implications of the proposed development on the Rogerstown Estuary SAC, Rogerstown Estuary SPA, North-West Irish Sea cSPA, Rockabill to Dalkey Island SAC, Lambay Island SPA and Rockabill SPA is likely to be required, in view of their conservation objectives and in combination with any other relevant plans or projects.