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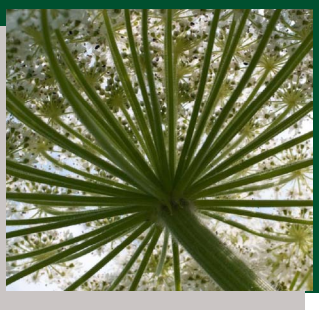

Carlow & Wexford Bridges Rehabilitation Contract

Refurbishment of Glebe Bridge WX-N11-003.00

Natura Impact Statement (NIS)

FINAL | OCTOBER 2016

ROD ROUGHAN & O'DONOVAN AECOM

Bonneagar Iompair Éireann Transport Infrastructure Ireland

Kildare County Council

National Roads Design Office.

County Carlow

Refurbishment of Glebe Bridge

Natura Impact Statement (NIS)

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Refurbishment of Glebe Bridge

Natura Impact Statement (NIS)

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1.0 INTRODUCTION

1.1 Background

Roughan & O'Donovan-AECOM Alliance (ROD-AECOM) has been appointed by Transport Infrastructure Ireland (TII) and the National Roads Design Office (NRDO) of Kildare County Council to undertake the design of refurbishment works to four bridges (three in Co. Carlow and one in Co. Wexford) as part of the Carlow & Wexford Bridges Rehabilitation Contract. This report provides a Nature Impact Statement (NIS) for the proposed works with regard to Glebe Bridge in Co. Wexford, hereafter referred to as "the Works". The Works are neither connected to nor necessary for the management of any Natura 2000 site. Stage 1: Screening for Appropriate Assessment (AAScr) was carried out to ascertain the likelihood of potentially significant effects on Natura 2000 sites arising from the Works.

During preparation of the Screening report, the statutory consultees, the National Parks & Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI), provided data on designated sites, habitats and species of conservation interest and population densities, where available. Of particular concern were potentially adverse direct, indirect or cumulative impacts on sites of European importance for nature conservation, *i.e*. Natura 2000 sites. The Works are in close proximity to the Slaney River Valley Special Area of Conservation (SAC) and the Wexford Harbour and Slobs Special Protection Area (SPA).

Due to the distance between the Works and the Special Conservation Interests (SCIs) of the Wexford Harbour and Slobs SPA, no pathways of risk from the Works to those SCIs were identified and the possibility of significant effects on this Natura 2000 site arising from the Works was, therefore, excluded. However, despite consideration that straightforward, generic best practice mitigation measures would be incorporated into the Works, the AAScr concluded that the possibility of significant effects on the Slaney River Valley SAC could not be ruled out. As a result of that conclusion and in accordance with Irish and European Union (EU) law, the assessment of the Works with regard to their effects on Natura 2000 sites has progressed to Stage 2: Appropriate Assessment (AA) with the preparation of this NIS.

1.2 Legislative Context

The European Communities (Birds and Natural Habitats) Regulations, 2011 transpose into Irish law Directive 2009/147/EC (the Birds Directive) and Council Directive 92/43/EEC (the Habitats Directive) and list habitats and species that are of international importance for conservation and require protection. This protection is afforded in part through the designation of sites that represent significant examples of habitats that support populations of listed species within a European context, known as Natura 2000 sites. Sites designated for bird species are classed as Special Protection Areas (SPAs) and sites designated for other protected species and/or habitats are classed as Special Area of Conservations (SACs). Together, SPAs and SACs comprise the Natura 2000 network of protected sites.

Bird species listed on Annex I of the Birds Directive (SCIs) and habitats and/or species listed on Annexes I and II, respectively, of the Habitats Directive (Qualifying Interests (QIs)) have full European protection in Natura 2000 sites. Species listed on Annex IV of the Habitats Directive are strictly protected wherever they occur, whether inside or outside the Natura 2000 network. Annex I habitats that occur outside of SACs are still considered to be of national and international importance and, under Regulation 27(4) (b) of the aforementioned Regulations, public authorities have a duty to avoid the pollution or deterioration of these habitats.

Article 6 of the Habitats Directive requires competent authorities, *i.e*. decision-making bodies with responsibility for planning, to carry out an AA of plans and projects that, alone and/or in combination with other plans and projects, are likely to have significant effects on Natura 2000 sites. This requirement is transposed into Irish law by Part 5: Regulation 42(1) of the aforementioned Regulations. SCIs/QIs in Natura 2000 sites are assigned COs of restoration or maintenance of their "favourable conservation condition", described by a set of Attributes with corresponding Targets that must be met if the CO for a given SCI/QI is to be achieved.

1.3 Requirement for an Assessment under Article 6

As per Part 5: Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations, 2011 (SI No. 477/2011), the competent authority has a duty to:

- Determine whether the proposed project is directly connected to or necessary for the management of one or more Natura 2000 sites; and, if not,
- Determine if the project is likely to have a significant effect on the Natura 2000 site(s), either individually or in combination with other plans or projects; and, if so,
- Make an AA of the implications of the activities for the Natura 2000 site(s) in view of the Conservation Objectives (COs) of the site(s).

As stated in Section 1.1, the Works are neither directly connected to nor necessary for the management of any Natura 2000 site and, therefore, AAScr was undertaken to determine the likelihood of significant effects on Natura 2000 sites. Likely significant effects could not be ruled with regard to the Slaney River Valley SAC and, consequently, the process progressed to full AA of the implications of the Works for that Natura 2000 site.

1.4 Stages of an Article 6 Assessment

The European Commission's *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2001) promotes a staged process, as set out below, the need for each stage being dependent on the outcome of the preceding stage.

1. Screening for Appropriate Assessment
2. Appropriate Assessment
3. Assessment of Alternative Solutions
4. Assessment where no alternative solutions exist and adverse impacts remain, *i.e*. the Imperative Reasons of Over-riding Public Interest (IROPIs) test, and compensatory measures.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. Stage 1 of the process is referred to as "Screening for Appropriate Assessment" and identifies whether the project is "likely to have a significant effect" upon any European site, *i.e*. any Natura 2000 site. Screening is undertaken without the inclusion of mitigation, except where it is an intrinsic element of the plan or project, as established by court rulings, *e.g*. Rossmore *v*. An Bord Pleanála (Ireland), Hart District Council *v*. Secretary of State for Communities & Local Government & Ors. (England and Wales) and Alternative A5 Alliance's Application for Judicial Review (Northern Ireland). If adverse effects are considered likely to be significant, potentially significant or uncertain, or if the Screening process becomes overly complicated, the process must proceed to Stage 2: AA, with the provision of an NIS.

Stage 2 includes detailed impact prediction and assessment of the likely effects on the Natura 2000 sites(s) in question and the proposal of specific mitigation measures, where necessary. If adverse impacts cannot be ruled out then the process continues to Stage 3 and assesses whether alternative solutions exist. If no alternatives exist and impacts on Natura 2000 sites are unavoidable, then a proposed plan or project can only be implemented where there are IROPIs, as detailed in Article 6(4) of the Habitats Directive.

1.5 Scope of the Natura Impact Statement

This report provides an NIS and is intended to address all issues regarding the Works and to allow An Bord Pleanála, as the competent authority, to carry out Stage 2: AA for the Project in compliance with Article 6(3) and (4) of the Habitats Directive.

The AAScr report was prepared in accordance with current guidelines (DEHLG, 2010) and provided the information required to establish whether or not the Works would be likely to have significant effects on Natura 2000 sites in the context of the COs of the SCIs/QIs for which they are designated. The report included the following details:

Description of the Works

- Location of the Works and distances from SCIs/QIs of Natura 2000 sites, including a map of the Works in relation to Natura 2000 boundaries;
- The size, scale and area of the Works in relation to Natura 2000 sites and projected level, class and frequency of activity; and,
- Details of construction works, including duration, materials and physical changes as detailed for the Works and any possible impacts that the Works may have on the defining structure and function of the Natura 2000 sites.

Potential impacts on Natura 2000 sites with respect to COs

- The potential impact of the proposed Works on the defining structure and function of the Natura 2000 sites.

Section 3.2.3 of the DEHLG (2010) guidance document states that the specific approach to Screening depends on the scale of likely impacts of the plan or project, the sensitivities of the ecological receptors potentially affected and the potential for in-combination effects, while cognisant of the Precautionary Principle (any unquantified impacts were treated as maximum foreseeable magnitude and any uncertain effects were treated as significant).

Taking into account all of the information gathered during the Screening process and adhering to the Precautionary Principle, potentially significant effects on the Slaney River Valley SAC arising from the Works were identified. This NIS, as part of Stage 2: AA, provides a more detailed assessment of the potential impacts identified in Stage 1 and proposes appropriate mitigation measures to minimise/eliminate these impacts.

1.6 Assessment Methodology

During the Screening process, information regarding design and construction sequence of the Works was gathered from Project Engineers. Information regarding the designation of habitats and species of conservation importance in the likely zone of impact was obtained from the NPWS. IFI does not have historical fisheries data relating to Edermine Stream, but was able to confirm that it supports salmonid and lamprey species.

Site visits by suitably qualified ecologists from ROD-AECOM were carried out during February and April 2016 to determine baseline ecological conditions at the site of the Works and to determine the proximity of the Works to SCIs/QIs of Natura 2000 sites and map the extent of invasive alien species (IAS) in the vicinity.

In addition, the following documents comprised the main sources of information used during the Screening process and preparation of this NIS:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Official Journal of the European Communities, *L206/7*;
- DEHLG (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin;
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive). Official Journal of the European Union, *L20/7*;
- EC (2000) *Managing European Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC*. Environment Directorate-General of the European Commission;
- EC (2001) *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission;
- European Communities (Birds and Natural Habitats) Regulations, 2011 (SI No. 477/2011);

- NPWS (2010) *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular Letter NPWS 1/10 & PSSP 2/10;
- NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland. Volume 2 & 3: Article 17 Assessments*. Department of Arts, Heritage and Gaeltacht, Dublin;
- SNH (2006) *Guidance for Competent Authorities when dealing with proposals affecting SAC freshwater sites*. Scottish Natural Heritage, Perth;
- Chanin, P. (2003) *Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series* 10. English Nature, Peterborough;
- Hendry, K. & Cragg-Hine, D. (2003) *Ecology of the Atlantic salmon*. *Conserving Natura 2000 Rivers Ecology Series* 7. English Nature, Peterborough;
- King, J.J., Hanna, G. & Wightman, G.D. (2008a) Ecological Impact Assessment (EcIA) of The Effects of Statutory Arterial Drainage Maintenance Activities on Three lamprey species (*Lampetra planeri* Bloch, *Lampetra fluviatilis* L., and *Petromyzon marinus* L.). *Series of Ecological Assessments on Arterial Drainage Maintenance* 9. Environment Section, Office of Public Works, Headford;
- Maitland, P.S. (2003) Ecology of the River, Brook and Sea lamprey. *Conserving Natura 2000 Rivers Ecology Series* 5. English Nature, Peterborough; and,
- IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*. Inland Fisheries Ireland, Dublin.

2.0 DESCRIPTION OF THE PROJECT

2.1 Background and Location

Glebe Bridge (EIRSPAN structure no. WX-N11-003.00) is a single-span masonry arch bridge carrying the N11 national road across Edermine Stream at Irish Transverse Mercator (ITM) Grid Reference 698202 634600. The structure has been extended by the addition of a single-span reinforced concrete structure to the east of the original arch. The masonry arch has a square span of 3.685 m and an overall width of 11.66 m. The concrete structure has a span of 3.05 m and an overall length of 27.36 m. The out-to-out width of the structure is 39.02 m. The findings of the Principal Inspection (NRA, 2015) stated that the structure was in poor condition, with some significant defects to the structure, notably:

- The embankments were found to be in fair condition with erosion of the river bank observed over an 11 m length;
- A number of significant circumferential cracks (up to 40 mm wide) were observed extending from abutment to abutment via the arch barrel; and,
- A number of significant cracks were observed in the reinforced concrete abutments.

ROD-AECOM has been appointed to carry out the design of the Works, which are required to address these deficiencies in the bridge structure, as well as the environmental assessments required to allow the Works to proceed. The Edermine Stream System drains mixed pasture and arable farmland south of Enniscorthy and discharges into the River Slaney. Streams in the system are tree-lined along much of their length and have been subject to canalisation in some places.

2.2 Detailed Description of the Works

The following activities are proposed as part of the refurbishment Works:

- Repairs/reshaping and provision of rock armour to the downstream embankments that have been eroded/scoured away;
- Repairs to cobbled riverbed where it has broken up c. 2 m downstream of the bridge, including the installation of a rock ramp system constructed from 4–5 rock ramp bed check weirs in the river channel over a 2–3 m length at this location;
- Repointing/pressure-grouting of wide cracks in the arch barrel;
- Resin-injection of cracks in concrete section of structure;
- Installation of grouted tie-back anchors at the downstream end of the structure to prevent the outlet spandrel wall (headwall) from overturning (this will involve coring through the wall and inserting an anchor through which grout can be pumped); and,
- Vegetation clearance on the embankment above the masonry arch section of bridge.

The Works will commence in October 2016. Elements of the Works that do not require in-stream activities will be undertaken at this time. In-stream activities will be required as part of the Works in order to install the new rock ramp and bank erosion protection and to gain access underneath the bridge. The in-stream elements of the Works will commence in July 2017 and will conclude within 16 weeks. Drawings of the Works are included in Appendix A. Tracked coring plant may be required at the masonry end for the installation of tie rods and pattress plates.

Vegetation removal will be necessary for site access and construction at overgrown sections of the Works. Under Section 40 of the Wildlife Acts, 1976–2012, in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided, an exemption is granted from restrictions in regard to clearance of vegetation. However, if vegetation removal is required during the restricted period (1st March to 31st August), a site inspection by a suitably qualified ecologist prior to and during clearance is considered best practice to ensure reasonable efforts are made to comply with other requirements of the Wildlife Acts and allow works to proceed.

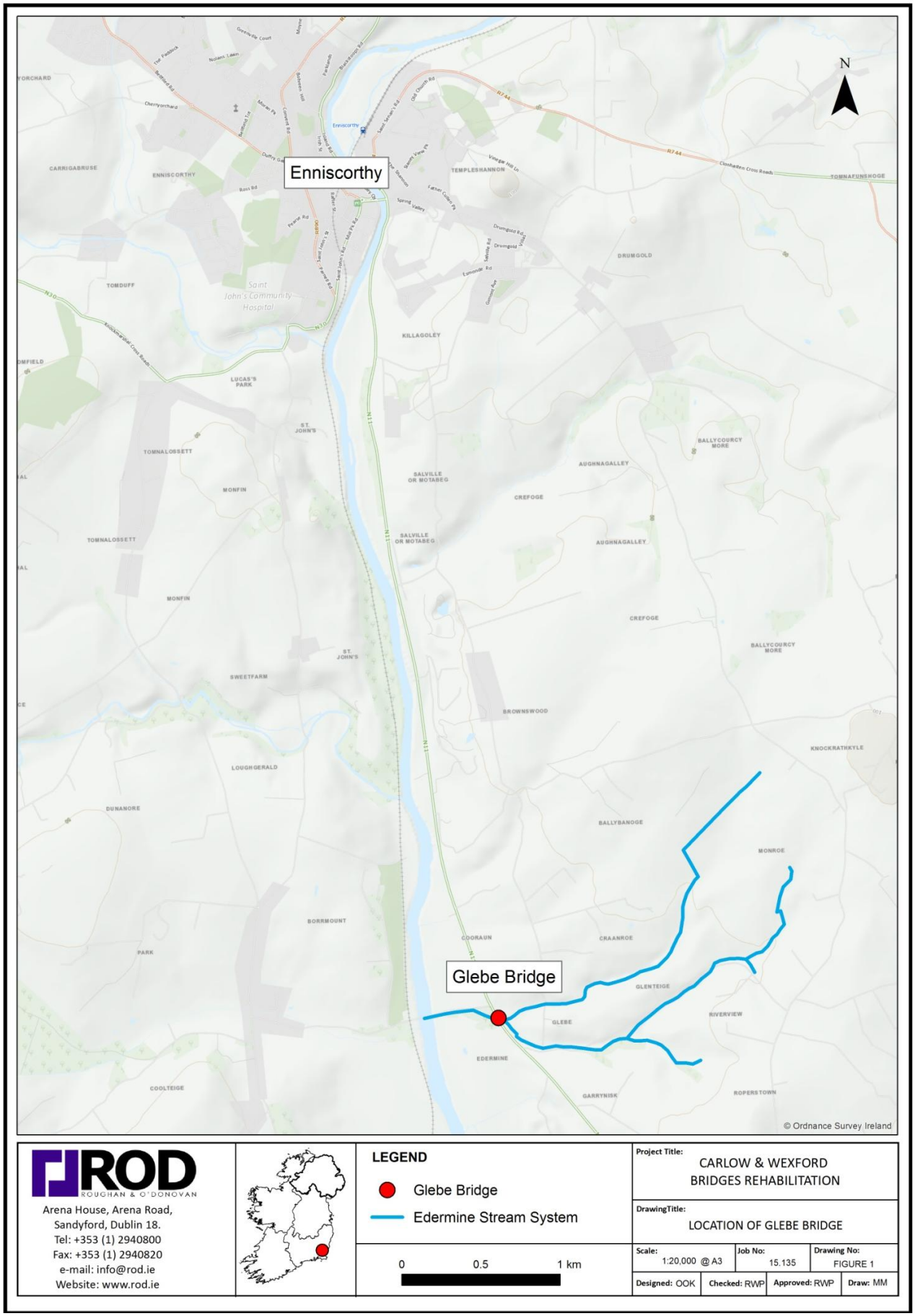


Figure 1. Location of the Works.

2.3 Receiving Environment

In order to determine the ecological baseline, site visits were conducted by suitably qualified ecologists on 16th February (ROD-AECOM, 2016a) and 1st April (ROD-AECOM, 2016b) 2016. These inspections included a preliminary assessment of the bridge structure with regard to its potential to support roosting Bats according to Collins (ed.) (2016) and an appraisal of the riverine habitat downstream of the bridge with regard to habitat suitability to support European Otter *Lutra lutra* and White-clawed Crayfish *Austropotamobius pallipes*. The methodology used to assess aquatic habitats at the bridge was based on the River Habitat Survey (RHS) developed by the Environment Agency for England and Wales (EA, 2003). Terrestrial habitats were categorised according to Fossitt (2000). The site was inspected for the presence of both aquatic and terrestrial IAS on the 1st April 2016 (ROD-AECOM, 2016b). Summaries of the findings of each of the studies insofar as they are relevant to the AA process are provided in the paragraphs below.

ROD-AECOM (2016a) *Carlow & Wexford Bridges Rehabilitation Contract. Refurbishment of Glebe Bridge WX-N11-003.00. Ecological Impact Assessment (EcIA).*

Suitable habitat to support Atlantic salmon *Salmo salar* and potentially, lamprey species (*Petromyzon marinus* and *Lampetra* spp.). Impacts upon these habitats are possible and, thus, close consultation with the relevant authorities throughout the planning and construction stages are recommended. It was found that there is suitable habitat for White-clawed Crayfish *Austropotamobius pallipes* but there is unlikely to be any significant loss of physical habitat suitable for this species as a result of the Works. In order to comply fully with the provisions of the Habitats Directive and European Communities (Birds and Natural Habitats) Regulations, 2011, a Cumulative Impact Assessment must be carried out so as to assess the potential for significant effects to arise from the works in combination with other plans and projects.

ROD-AECOM (2016b) *Carlow & Wexford Bridges Rehabilitation Contract. Refurbishment of Glebe Bridge WX-N11-003.00. Invasive Alien Species Risk Assessment.*

Five stands of Japanese Knotweed *Fallopia japonica* were identified on the site, some of which may be impacted upon by the Works and/or access to the site. Cherry Laurel *Prunus laurocerasus* was abundant throughout the site and single examples of Montbretia and *Rhododendron* were identified in the wider area. In order to minimise the risk to the Slaney River Valley SAC and Wexford Harbour and Slobs SPA from IAS, an IAS Management Plan shall be prepared detailing the Works area and access routes, impacted stands of IAS and the relevant control measures to be put in place.

3.0 NATURA 2000 SITES

3.1 Proximity to Natura 2000 Sites

Section 3.2.3 of DEHLG (2010) states that defining the likely zone of impact (ZOI) for AAScr and the approach used will depend on the nature, size, location and the likely effects of the plan or project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by an activity are the physical distance from the activity to the site, the sensitivities of the ecological receptors and the potential for in-combination effects.

The Works require in-stream activities, which will take place at a distance of 125 m from the River Slaney SAC. Site preparation and construction were considered to be potential sources of risk for direct, indirect and cumulative effects. Any sensitive water bodies and watercourses with hydrological connectivity to Natura 2000 sites were considered to be pathways of risk. Therefore, the ZOI in this case has been defined as the limit of potential hydrological impact (extent of the catchment). Receptors were considered to be the QIs of Natura 2000 sites.

River sub-basin limits (sourced from the Environmental Protection Agency (EPA)) were used to define the likely ZOI. ArcView software using publicly available Ordnance Survey Ireland (OSi) maps and NPWS shapefiles were used to identify the boundaries of Natura 2000 sites occurring in proximity to the Works (Table 1; Figure 2). It was determined that two Natura 2000 sites, *i.e*. the Slaney River Valley SAC and Wexford Harbour and Slobs SPA, occur within the likely ZOI. Figure 2 shows the location of the Works and their likely ZOI in relation to Natura 2000 sites.

Table 1 Proximity of the Works to Natura 2000 sites

Natura 2000 site	Site description	Closest proximity
Slaney River Valley SAC [000781] Area: 6,020.48 ha	The Slaney River Valley comprises the freshwater stretches of the River Slaney (a major river that drains much of the south-east region) as far as the Wicklow Mountains flowing through the Counties of Wicklow, Wexford and Carlow. The tidal and freshwater boundary of the River Slaney is defined as the Old Bridge in Enniscorthy under Section 10 of the Fisheries (Consolidation) Act, 1959. However, IFI advise there is no saline influence at Enniscorthy and that this is the case for some distance downstream until Mackmine Bridge.	125 m
Wexford Harbour and Slobs SPA [004076] Area: 5,982.0 ha	Wexford Harbour and Slobs SPA incorporates the lowermost part of the estuary of the River Slaney and extents upstream as far as 700 m south of Enniscorthy. The site is divided between the natural estuarine habitats of Wexford Harbour and the reclaimed polders known as the North and South Slobs. This site is internationally important for several species of waterfowl and is one of the top three sites in the country for numbers and diversity of wintering birds.	450 m

Figure 2. Location of Natura 2000 sites in the likely zone of impact.

3.2 Risk to Special Scientific Interests/Qualifying Interests

In Ecological and Environmental Impact Assessment, for an impact to occur there must be a risk enabled by having a "source", *e.g*. construction works site, a "receptor", *e.g*. an SAC or other ecologically sensitive feature, and a pathway between the source and the receptor, *e.g*. a watercourse. The risk of the impact does not automatically mean that it will occur or that it will be significant. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature of the risk and degree exposure to it and the characteristics of the receptor.

The Slaney River Valley SAC is a Natura 2000 site selected for the following habitats and species listed on Annexes I and II of the Habitats Directive [* denotes "priority" QIs in danger of disappearing from the EU]; [numbers in square brackets are Natura 2000 codes]:

Table 2 QIs of the Slaney River Valley SAC. Source: NPWS (2013), unless specifically referenced

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Estuaries [1130]	0.5 km	The estuary is the downstream part of a river valley, subject to the tide and extending from the limit of brackish waters. River estuaries are coastal inlets where there is generally a significant freshwater influence. Muddy to sandy substrates are the most common estuarine substrates in an Irish context and this is reflected by the biological communities occurring therein. 19 SACs are designated for estuaries in the Member State. It is estimated that a total of 67,400 ha of 1130 occurs within the Natura 2000 network. This habitat forms *c*. 50.0% (3,010 ha) of the Slaney River Valley SAC, equivalent to *c*. 4.5% of the entire national Natura 2000 contribution for this QI. The overall conservation status of this habitat is considered to be Inadequate and "improving". The major pressures on Irish estuaries include pollution to surface waters, fishing and harvesting of aquatic resources and bottom culture.	**Yes – Given the proximity of the Site to this QI, potential pathways of risk are considered to exist between the Works and the QI.**
Mudflats and sandflats not covered by seawater at low tide [1140]	10.0 km	This habitat is found exclusively between the low water and mean high water marks. It is often part of the Annex I habitats Large shallow inlets and bays and Estuaries but can occur independently. The fundamental building block of this habitat is sediment ranging from around 1 µm to 2 mm. The finer silt and clay sediments are dominant in mud flats and the larger sand fractions are associated with areas exposed to significant wave energy. The fine sediment of mudflats is most often associated with rivers. Biological communities found in this habitat are very similar to those found in Estuaries. 42 SACs are designated for this QI in the Member State. It is estimated that a total of 53,700 ha of 1140 occurs within the Natura 2000 network. This habitat forms *c*. 20.0% (1,204 ha) of the Slaney River Valley SAC, equivalent to *c*. 2.2% of the entire national Natura 2000 contribution for this QI. The overall conservation status of this habitat is considered to be Inadequate and "improving". The major pressures on this habitat in Ireland include pollution to surface waters, fishing and harvesting of aquatic resources and bottom culture.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out.

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	0.5 km	The description of 3260 is broad, covering rivers from upland bryophyte and macroalgal-dominated stretches, to lowland depositing rivers with pondweeds and starworts. Selection of SACs for this habitat in Ireland has used this broad interpretation. Thus, it must be recognised that a number of sub-types of this habitat exist in Ireland. 21 SACs are designated for Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Member State. It is estimated that a total of 3,246 ha of 3260 occurs within the Natura 2000 network. This habitat forms *c*. 4.0% (240.82 ha) of the Slaney River Valley SAC, equivalent to *c*. 7.4% of the entire national Natura 2000 contribution for this QI. The overall conservation status of this habitat is considered to be Inadequate and "declining" due to numerous pressures, including pollution of surface waters from agricultural, forestry and industrial sources, as well as modification of hydrological regimes.	**Yes – Given the proximity of the Works to this QI, potential pathways of risk are considered to exist between the Works and the QI.**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	6.2 km	Old sessile oak woods are defined in the interpretation manual of EU habitats as "acidophilous *Quercus petraea* woods, with low, low-branched, trees, with many ferns, mosses, lichens and evergreen bushes". Three indicative species are listed: *Quercus petraea*, *Ilex aquifolium* and *Blechnum* ssp. (*sic*). A wider interpretation that also includes woods with *Q*. × *rosacea* and *Q*. *robur* may also be used. 40 SACs are designated for Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in the Member State. It is estimated that a total of 3,899 ha of 91A0 occurs within the Natura 2000 network. This habitat forms *c*. 1.0% (60.2 ha) of the Slaney River Valley SAC, equivalent to *c*. 1.5% of the entire national Natura 2000 contribution for this QI. The overall conservation status of this habitat is considered to be Bad and "improving".	No – Given the distance between this QI and the Works, no complete impact source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out.
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]*	2.1 km	Alluvial Forests occur on heavy soils that are periodically inundated by the annual rise of river levels, but which are otherwise well drained and aerated during low water. The herbaceous layer includes many large species such as *Filipendula ulmaria*, *Angelica sylvestris* and *Carex acutiformis*, vernal species such as *Ranunculus ficaria* and *Anemone nemorosa*, and other indicative species such as *Carex remota*, *Lycopus europaeus*, *Urtica dioica* and *Geum rivale* are also listed. There are also gallery forests of tall Willows (*Salicion albae*) in which tree roots are almost continuously submerged. 25 SACs are designated for Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) in the Member State. It is estimated that a total of 1,046 ha of 91E0 occurs within the Natura 2000 network. This habitat forms *c*. 1.0% (60.2 ha) of the Slaney River Valley SAC, equivalent to *c*. 5.8% of the entire national Natura 2000 contribution for this QI. The overall conservation status of this habitat is considered to be Bad and "improving".	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out.

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029]	The only viable population is located in the Derreen River, upstream of Hacketstown (Moorkens, 1995). The closest proximity to the Works is cited at the confluence of the River Derry at Ballyshonock *c.* 23 km upstream of Enniscorthy (Moorkens, 2000).	The Freshwater Pearl Mussel is a large, long-lived (100+ years) mollusk that is found in low-nutrient, soft to neutral rivers and, sometimes, lakes throughout the Northern Hemisphere. The larval stage is parasitic, hosted on the gills of salmonids, but is not harmful to the host. After this stage, they drop off their hosts and burrow into the substrate where they mature for a period of 7 to 15 years before emerging at the riverbed. Pearl Mussel populations have declined by over 90% across Europe during the 20th Century, mostly due to harvesting. This species is listed in the Irish Red Data Book as Critically Endangered and is listed on Annex II and V of the Habitats Directive and protected under the Wildlife Act, 1976. 19 SACs are designated for the Freshwater Pearl Mussel in the Member State. 93.5% of the Pearl Mussel population in the Member State occurs within the Natura 2000 network. Population size within the Slaney River Valley SAC is estimated at 3,000 individuals, accounting for < 0.03% of the national population. The SAC is nonetheless considered to be of "good value" for the conservation of Pearl Mussel. The overall conservation status of the species is considered Bad and "declining", with major pressures/threats including anthropogenic alterations to hydrology, groundwater abstraction, siltation, diffuse and point-source pollution and restructuring of land holding.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out.
Sea lamprey (*Petromyzon marinus*) [1095]	Spawning recorded in the main channel of the Slaney near Enniscorthy (King & Linnane, 2004). Considered to be in immediate proximity.	The Sea lamprey is a primitive anadromous fish species. Adults live at sea as external parasites on host fish. Migration to fresh water occurs in spring and spawning in June/July. Hatching of ammocoetes takes place within days and the immature lamprey swims or drifts downstream until it encounters an area of fine sediment into which it can burrow. Transformation to the adult stage occurs in late summer and young adults migrate downriver in late autumn/winter. Non-migratory forms have also been noted. Barriers to migration are seen as major negative impacts on this species and it is listed in the Irish Red Data Book as Near Threatened. Sea lampreys are protected under Annex II of the Habitats Directive and under the OSPAR Convention. 12 SACs are designated for the Sea lamprey in the Member State, containing all 467 km of the national resource of suitable freshwater habitat. An extrapolated estimate of the spawning population for Sea lamprey within the main channel of the River Slaney was determined by King & Linnane (2004) as 74–148 individuals. This population is considered to account for less than 2% of the national population. The SAC is nonetheless considered to be of "good value" for the conservation of Sea lampreys. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including canalisation and barriers to migration.	**Yes – Given the proximity of the Works to various life stages of this QI, potential pathways of risk are considered to exist between the Works and the QI.**

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Brook lamprey (*Lampetra planeri*) [1096]	Spawning recorded in the main channel of the Slaney near Enniscorthy (King & Linnane, 2004). Considered to be in immediate proximity.	The brook lamprey is the smallest of the three lampreys recorded in Ireland. It is non-parasitic and non-migratory as an adult, living its entire life in freshwater. Adults spawn in spring and, after hatching, the ammocoetes drift or swim downstream before encountering areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn and die. Brook lampreys are protected under Annex II of the Habitats Directive and listed in the Irish Red Data Book as "least concern". 10 SACs are designated for this species in the Member State, containing 71 hectads (10 km grid squares) of the national resource of 753 hectads in which this species occurs. This population is considered to account for less than 2% of the national population. The SAC is nonetheless considered to be of "good value" for the conservation of brook lampreys. The overall conservation status of the species is considered Favourable, with main pressures/threats including dredging and removal of sediments.	**Yes – Given the proximity of the Works to various life stages of this QI, potential pathways of risk are considered to exist between the Works and the QI.**
River lamprey (*Lampetra fluviatilis*) [1099]	Spawning recorded in the main channel of the Slaney near Enniscorthy (King & Linnane, 2004). Considered to be in immediate proximity.	The river and brook lamprey are indistinguishable as larvae, living as filter feeders in sediment. The mature adult forms are clearly distinguishable on the basis of body size. This species is listed in the Irish Red Data Book as "least concern" and is protected under Annex II and V of the Habitats Directive. 10 SACs are designated for this species in the Member State. It is considered to account for less than 2% of the national population. The SAC is nonetheless considered to be of "good value" for the conservation of river lamprey. The overall conservation status of the species is considered to be Favourable. Major pressures/threats to river lampreys include both diffuse and point-source pollution, invasive species, dredging and barriers to migration.	**Yes – Given the proximity of the Works to various life stages of this QI, potential pathways of risk are considered to exist between the Works and the QI.**
Twaite Shad (*Alosa fallax*) [1103]	No spawning locations known in the River Slaney. Occurrence of other life-stages unlikely close proximity to the Works.	The Twaite Shad is a large member of the herring family living in the lower reaches of estuaries or at sea as adults, feeding on juvenile fish and on crustaceans. Adult fish travel upriver in Irish estuaries and spawn at the upper tidal reaches in a series of rivers in the southeast. Eggs are fertilised externally and either drop to the bed or float in the water column. The eggs hatch after a short period and young can reach up to 100 mm by the end of the first year. Irish Twaite Shad may live in estuarine waters for at least 2 years before going to sea. Twaite Shad are listed in the Irish Red Data Book as Vulnerable and are protected under Annex II and V of the Habitats Directive. 4 SACs are designated for this species in the Member State. A study of Twaite Shad density in the River Slaney recorded low numbers within the lower catchment and estuary of Twaite Shad from the estuary, according to King & Linnane (2004). The population size is considered to account for between 2% and 15% of the national population. The SAC is considered to be of "excellent value" for the conservation of Twaite Shad. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including invasive species, fishing and inbreeding.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out.

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Atlantic salmon (*Salmo salar*) [1106]	Immediate	The Atlantic salmon is an anadromous species indigenous to the North Atlantic. salmon use rivers to reproduce and as nursery areas during their juvenile phase. Adults spend 1 to 3 years at sea where growth rates are much greater. The Irish population generally comprises fish that spend two winters in freshwater before going to sea in April-June. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer. Smaller numbers spend two winters at sea, returning mainly in spring. A small proportion of the adult population returns to sea post-spawning and can spawn again. *Salmo salar* is listed in the Irish Red Data Book as Vulnerable. It is protected under Annex II and V of the Habitats Directive (in fresh water only) and under the OSPAR Convention. 26 SACs are designated for this species in the Member State, containing between 97,643 and 146,464 individuals of the national population of 244,107. Population size within the Slaney River Valley SAC is approximately 1,331, according to Paul Johnston Associates (2010). It is considered to account for less than 2% of the national population. The SAC is nonetheless considered to be of "excellent value" for the conservation of salmon. The overall conservation status of the species is considered Inadequate but "stable", with major pressures/threats including agricultural intensification, disposal of household/recreational facility waste, poaching and pollution due to agriculture, forestry, household sewage and waste waters.	**Yes – Given the proximity of the Works to this QI, potential pathways of risk are considered to exist between the Works and the QI.**
European Otter (*Lutra lutra*) [1355]	Considered to be immediate	The Otter is a large carnivore with a long, slim body, short legs with webbed feet and a tapered tail. Adult males can reach 1 m in length and 10 kg in weight. Dramatic declines occurred in many European populations during the latter half of the 20th Century. As a result, Otter became extinct in several countries. However, Ireland has remained a strong-hold for the species. Otter are protected under Annex II and IV of the Habitats Directive and under the Wildlife Act, 1976. The species is listed in the Irish Red Data Book as Near Threatened and a Regulation 39 Threat Response Plan has been drawn up to protect it (NPWS, 2009). 45 SACs are designated for this species in the Member State, estimated to support 468–660 of the country's 7,218–10,186 breeding females. The most recent estimate of population size within the Slaney River Valley SAC is determined as 71, according to Reid *et al.* (2013). It is considered to be less than 2% of the national population. The SAC is nonetheless considered to be of "excellent value" for the conservation of Otter. The overall conservation status of the species is considered Favourable, with road mortalities constituting the major pressure at present.	**Yes – Given the proximity of the Works to this QI, potential pathways of risk are considered to exist between the Works and the QI.**

Qualifying Interest (QI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Qualifying Interest (QI)?**
Common (Harbour) Seal (*Phoca vitulina*) [1365]	> 15 km	The Harbour Seal is the smaller of the two species of true seal that regularly breed on the Irish coast and is also distinguished by its preferential use of more sheltered bays and estuaries, often near human settlements, in which it occupies established haul-out sites. In Ireland, the species occurs in estuarine, coastal and fully marine areas, but individuals occasionally travel several kilometres upriver. Harbour Seals are protected under Annexes II and IV of the Habitats Directive and under the Wildlife Acts, 1976-2012. 13 SACs are designated for this species in the Member State. The Slaney River Valley SAC is considered to have a permanent population of between 16 and 27 individuals, 20 of which are reproducing. While this is considered to account for less than 2% of the national population, the SAC is still considered to be of "good value" for the conservation of harbour seals. The overall conservation status of the species is considered to be Favourable. The main pressures/threats for harbour seals are fishing/harvesting of aquatic resources and seismic exploration/explosions.	No – Given the distance between the Works and this QI, no potential pathways of risk were identified. Furthermore, the distance of at least 500 m from the Works to suitable foraging habitat for Harbour Seal is sufficient to exclude the possibility of significant disturbance to this species.

The Wexford Harbour and Slobs SPA is a Natura 2000 site selected for the following bird species listed on Annex I Birds Directive [numbers in square brackets are Natura 2000 codes]:

Table 3 SCIs of the Wexford Harbour and Slobs SPA. Sources: Colhoun & Cummins (2013), NPWS (2013b) and Eionet (2015), unless specifically referenced.

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Little Grebe (*Tachybaptus ruficollis*) [A004]	3.5 km	The little grebe has a wide global distribution, with a breeding range extending across Europe, central/southern Asia and central/southern Africa, to Japan and Papua New Guinea in the east. Outside the breeding season, the species prefers open, although sheltered waters on coasts and estuaries. Current national population estimate are 1,490 wintering individuals. 6 SPAs are designated for this species in the Member State.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Great Crested Grebe (*Podiceps cristatus*) [A005]	14 km	Some great crested grebes move immediately after breeding to large lakes and reservoirs and certain coastal areas to moult. An increase in the European population has been recorded. In winter, Great Crested Grebes show a marked shift from inland waters to the sea, although on the continent large numbers remain on inland lakes. In normal winters, Ireland supports birds from continental western Europe. Current national population estimates are 1560 wintering individuals. 9 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 100 individuals.	
Cormorant (*Phalacrocorax carbo*) [A017]	3.5 km	Outside the breeding season (August to February), some Cormorants remain in the vicinity of their colonies, while others move to sheltered, coastal or inland locations – mostly south and east of their breeding sites. Ringing analyses (Wernham *et al*., in press) show that Cormorants from Ireland move to continental Europe. There is significant movement of coastal breeding birds inland in winter. Overall its European population is classed as secure with a long term increasing trend in the Member State. Current national population estimates are 5211 wintering individuals. 22 SPAs are designated for this species in the Member State. The baseline population size for Wexford Harbour and Slobs SPA is 177 individuals.	
Grey Heron (*Ardea cinerea*) [A028]	3.5 km	Grey Heron are widespread throughout Ireland in inland and coastal wetlands. Current national population estimates are 1,870 wintering individuals. 4 SPAs are designated for this species in the Member State.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Bewick's Swan (*Cygnus columbianus bewickii*) [A037]	14 km	The main European wintering grounds of Bewick's Swan are in lowland areas of northern Europe, from Denmark, through the Low Countries to northern France, Britain and Ireland. Bewick's Swans winter on shallow freshwater lakes, marshes or slow-moving rivers near or adjacent to extensive grasslands liable to flooding. In Ireland, they feed predominantly on permanent wet grassland and, in the past, brackish coastal lagoons. In recent decades this species has increasingly taken to foraging on agricultural land, especially waste root crops, grain stubbles and winter cereals. In general, they feed by day and return to wetland areas to roost overnight. They are highly gregarious and often occur in flocks of several hundreds. Current national wintering population estimates from several sources are inconsistent; 79 individuals (NPWS/Eionet); 150 individuals (Colhoun & Simmons, 2013) given the significant (94%) population decline over the last 25 years. 3 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA was cited as 231 individuals at designation however recent I-WeBS counts are 14 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Whooper swan (*Cygnus cygnus*) [A038]	14 km	Ringing recoveries indicate that the majority of Whooper Swans originate from the Icelandic breeding stock. Whooper swans overwinter on freshwater lakes and marshes and, in western Europe especially, on low agricultural land, generally in coastal areas. Current national wintering population estimates are 14,530 individuals. 22 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 120 individuals.	
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	14 km	Brent geese have a circumpolar distribution breeding in the extreme high Arctic in all northern countries. The range extends from Greenland to Svalbard and northern Russia, continuing through Alaska to the Canadian Arctic Archipelago. The Canadian breeding population winters almost entirely in Ireland. The distribution in Ireland is wholly coastal, with large estuaries and areas of intertidal mudflats with fine sediments preferred. Current national wintering population estimates are 36,380 individuals. 24 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,380 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Shelduck (*Tadorna tadorna*) [A048]	14 km	The global range of the Shelduck extends discontinuously east from western Europe, through central Asia to south to Iran and Pakistan. In late summer, major aggregations gather to moult. Many Irish birds move to the Helgoland Bight of the Wadden Sea, with very large numbers occurring in this area from mid-July to the end of August. Increases are reported in the breeding populations of most European countries. Current national wintering population estimates are 11,760 individuals. 17 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 359 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Wigeon (*Anas penelope*) [A050]	14 km	In winter, Wigeon undertake significant migrations south and south-west to winter on the coasts of Europe. Wintering areas are discontinuous, but occur especially on Atlantic coasts, the shores of the Mediterranean and Black Sea, some inland areas of North Africa and the Middle East. In winter, Wigeon are highly gregarious, and occur in large, mobile flocks that rapidly move to other areas should conditions change for the worse. Wigeon is largely a coastal species, feeding on mud-flats, coastal flooded grassland and saltmarsh pastures. The north-west European population has steadily increased since the early 1970s, despite some fluctuations in this overall trend. Current national wintering population estimates are 62,980 individuals. 25 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 2,800 individuals.	
Teal (*Anas crecca*) [A052]	3.5 km	Teal have a wide global distribution across Eurasia and North America, breeding in boreal regions on both continents, especially within taiga and steppe regions but also extending north into the low Arctic. The species is migratory on both continents, moving south in autumn from northern breeding areas to more southerly wintering grounds. Non-breeding Teal are widespread throughout Ireland, favouring areas of shallow water on estuarine coastal lagoons, coastal and inland marshes, and flooded pastures and ponds. Teal are highly susceptible to the consequences of periods of severe winter weather and often show significant dispersal to warmer areas. Current national wintering population estimates are 29,050 individuals. 21 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,002 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Mallard (*Anas platyrhynchos*) [A053]	14 km	Mallards are widespread throughout Europe in both breeding and non-breeding seasons, being absent only from high montane regions and the Russian low Arctic. They tolerate human presence, often occurring on artificial waterbodies in close proximity to man. In winter they also occur commonly in estuaries and along sheltered coasts, but avoid offshore waters. Although the Mallard is migratory, it does not normally move in large numbers to Ireland from the continent during cold winters, although a large influx has been noted in winter. Current national population estimates are 15,400 pairs. 9 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 3,035 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Pintail (*Anas acuta*) [A054]	14 km	Pintail has a widespread global distribution across North America and north Eurasia. In Europe, Pintail is a rare breeding bird, occurring in a few suitable wetland areas. Most birds occurring in winter migrate from more northern and eastern breeding areas in Fennoscandia and Russia. European distribution in winter is predominantly coastal, and Pintail form large flocks on brackish coastal lagoons, in estuaries and deltas, and on large inland lakes. Current national wintering population estimates are 1,280 individuals. 11 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 67 individuals.	
Scaup (*Aythya marila*) [A062]	14 km	Scaup breeds at high latitudes across northern Eurasia and North America, and winters in temperate coastal waters along both coasts of North America, north-west Europe, the Black and Caspian Seas and east Asia. In winter, Scaup are found mainly in areas of soft-shore coastlines, often in brackish area. They are also found on lagoons, estuaries, sheltered bays and shallow marine waters, as well as inland seas, and – infrequently – large lakes. Current national wintering population estimates are 820 individuals. 5 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 354 individuals.	
Goldeneye (*Bucephala clangula*) [A067]	14 km	The Goldeneye has a wide breeding distribution across northern Eurasia and North America, mainly within the taiga zone. During the winter, this species favours coastal areas in the northern part of its range and large rivers, lakes, reservoirs and coastal lagoons further south. In Europe, Goldeneye migrate south and west from their northern breeding areas in continental Eurasia to winter on the southern coasts of Norway, the western Baltic, and the southern North Sea. Current national wintering population estimates are 6,040 individuals. 6 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 126 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Red-breasted Merganser (*Mergus serrator*) [A069]	14 km	Red-breasted Mergansers are globally distributed at northern latitudes across northern Eurasia, Greenland and North America. In winter, birds migrate to coastal waters in the North and Baltic Seas, along Atlantic coasts, as well as further south to the Mediterranean, Black and Caspian Seas. In Britain and Northern Ireland, winter flocks are usually small. During the winter, this species favours brackish or saline waters, preferring shallow, protected coasts, estuaries, bays and lagoons with an abundance of small fish and aquatic invertebrates. Current national population estimates are 1,550 wintering individuals. 10 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 153 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Hen Harrier (*Circus cyaneus*) [A082]	14 km	Hen Harriers have a widespread global distribution. Across much of this range, Hen Harriers are migratory, moving south from northerly breeding areas outside the nesting period. In the Palearctic, migrants winter in southern parts of Europe, the Middle East and through southern areas of central and eastern Asia. In southern and western Europe, however, the species has a scattered breeding distribution – probably reflecting past and current patterns of persecution and land-use change. Current national population estimates are 269-349 wintering individuals. 8 SPAs are designated for this species in the Member State.	
Coot (*Fulica atra*) [A125]	3.5 km	Coots have a wide global distribution. In temperate and sub-tropical regions, Coots are resident, but populations in northern and eastern Europe move south to winter from the North Sea south to the Middle East, as well as in parts of North Africa. Coots generally favour large, still or slow-moving eutrophic or mesotrophic waterbodies, such as lakes, ponds, gravel pits, canals, slow-moving rivers, open marshes, and lagoons. Populations of Coot in many areas of Europe have shown marked fluctuations due to hard weather, but overall the species has expanded its range since the late 19th century. Current national population estimates are 18,270 wintering individuals. 12 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 353 individuals.	
Oystercatcher (*Haematopus ostralegus*) [A130]	14 km	The global distribution of Oystercatchers is quite discontinuous. In Iceland and northern Europe, they breed largely in coastal areas, while occurrence is more continuous in lowland areas of Ukraine and Russia, extending to parts of central Asia. Oystercatchers breeding in Europe and central Asia generally move south to winter in coastal areas elsewhere in Europe, the Middle East, and east and west Africa. Current national population estimates are 45,480 wintering individuals. 16 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,090 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Golden plover (*Pluvialis apricaria*) [A140]	14 km	The global distribution of Golden Plovers is very much restricted to boreal regions of the western Palearctic, with only a small extension further east. Golden Plovers generally breed between 60^{o} –70^{o} N, although nesting occurs significantly further south in Britain and Ireland (being the southernmost extent of the global range). Generally, within southern parts of the range the distribution is discontinuous. In winter, birds migrate south and westwards, with localised wintering occurring from North Africa and Iberia, east through the Mediterranean Basin to the Middle East and the shores of the Caspian Sea. Large numbers winter in Britain and Ireland, France and the Low Countries. Current national population estimates are 99,870 wintering individuals. 36 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 5,590 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Grey plover (*Pluvialis squatarola*) [A141]	14 km	Grey Plovers have a very restricted global distribution. They have an almost circumpolar breeding range, occurring in the high Arctic from the Kanin Peninsula east to the Bering Sea. In North America, they occur from Alaska to the western side of Baffin Island. Globally, there are five recognised biogeographic populations. Of these, birds occurring in Europe belong to the East Atlantic Flyway population which comprises those breeding in the western Russian high Arctic. These birds winter from the Wadden Sea, along the Atlantic coasts of Europe south to West Africa. Current national population estimates are 2,850 wintering individuals. 21 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 848 individuals.	
Lapwing (*Vanellus vanellus*) [A142]	3.5 km	Lapwings have a wide global distribution throughout the temperate regions of Eurasia, from Britain, Ireland and Iberia in the west, to the Pacific coast of Russia at the Sea of Japan in the east. In Scandinavia, breeding extends north but through most of the range Lapwings breed further south. Lapwings breed in all European countries, although within the Mediterranean Basin their distribution is highly localized. Across most of the range, Lapwings are highly migratory, moving south at the end of the breeding season to winter. Recent declines in the breeding population have been reported in many parts of north-west Europe. Current national population estimates are 88,580 wintering individuals. 23 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 10,387 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Knot (*Calidris canutus*) [A143]	14 km	Knots are found in many regions of the world, although they are highly localised within each region. The breeding distribution is circumpolar, with the species nesting in the high Arctic. After the breeding season, they migrate through temperate coastal regions in the northern hemisphere to wintering grounds in the southern hemisphere. They undertake some of the longest migrations of any bird species. Current national wintering population estimates are 22,120 individuals. 13 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 252 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Sanderling (*Calidris alba*) [A144]	14 km	The Sanderling is a very high-Arctic breeding wader with a circumpolar breeding distribution. Its range extends from the northernmost parts of the Canadian Arctic archipelago, through north and north-eastern Greenland to the Taimyr Peninsula and islands off the north coast of Siberia. The birds that winter in western Europe are thought to mostly originate from Siberia. Since circa 1986, Sanderling numbers at the mostly estuarine WeBS sites have fluctuated considerably. Current national wintering population estimates are 5,280 individuals. 15 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 105 individuals.	
Dunlin (*Calidris alpina*) [A149]	14 km	Dunlin have a wide global distribution around the Arctic, and are found in nearly all Arctic regions. In Europe, they also extend south to temperate regions where they are found in wetland habitats. Breeding Dunlin are characteristic of moorland and upland habitats and this is reflected in the species' breeding distribution. Current national wintering population estimates are 44,380 individuals. 23 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,772 individuals.	
Black-tailed Godwit (*Limosa limosa*) [A156]	14 km	Black-tailed Godwits have a markedly discontinuous global breeding distribution, restricted to Eurasia. Breeding occurs from Iceland in the west, to central Siberia. The species is migratory, moving at the end of the breeding season to winter locally in the Mediterranean basin, in sub-Saharan Africa, as well as through northern India and coastal areas of south-east Asia and Australia. Breeding sites are highly localized. Breeding distribution of Black-tailed Godwits has become fragmented. Current national wintering population estimates are 18,080 individuals. 25 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 647 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Bar-tailed Godwit (*Limosa lapponica*) [A157]	3.5 km	The Bar-tailed Godwit breeds in Arctic regions of Eurasia, from northern Scandinavia, through high latitudes of Russia to the west coast of Alaska. It winters in north-western Europe south to southern Spain and Portugal. Bar-tailed godwits are almost entirely coastal in their winter habits, feeding mainly on worms both on sandy and muddy shores. As a mid- to high-Arctic nesting species, significant between-year population changes might be expected as a consequence of variation in weather and predation pressures on breeding areas. Current national wintering population estimates are 11,890 individuals. 24 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 647 individuals.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
Curlew (*Numenius arquata*) [A160]	3.5 km	The breeding distribution of Curlew is globally restricted to the temperate and boreal regions of Europe and Asia. The species breeds from Ireland and Britain in the west, across continental Europe to the Russian far east. In winter, Curlews migrate south from their breeding areas and occur widely, though sparsely on southern hemisphere coasts in the northern winter. Despite its recent expansion into lowland agricultural habitats, the species is still more abundant in uplands and northern regions where there are extensive areas of moorland and rough grazing. Current national wintering population estimates are 27,830 individuals. 19 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,301 individuals.	
Redshank (*Tringa totanus*) [A162]	3.5 km	The Eastern Atlantic Flyway population of the nominate race of Redshank winters from the North Sea countries through the western part of the Mediterranean to West Africa. Both totanus and robusta Redshank populations are classified as declining. At least some of this decline is attributable to changes in agricultural practices and loss of important wetland sites. Current national wintering population estimates are 19,400 individuals. 21 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 249 individuals.	
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	3.5 km	The black-headed gull is the most widely distributed seabird breeding in Ireland, with similar numbers breeding inland as on the coast. The majority of the breeding population is resident throughout the year. Black-headed gulls breed throughout the middle latitudes of the Palaearctic and have recently formed a breeding outpost in north eastern North America. Habitats such as wetlands, bogs, marshes and artificial ponds are favoured breeding sites, but dry areas adjacent to water are also used. Current national wintering population estimate is 1,617 individuals. 19 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 1,274 individuals.	

Special Conservation Interest (SCI)	Closest proximity	Extent and character	Do potential pathways of risk exist between the Works and Special Conservation Interest (SCI)?**
Lesser Black-backed Gull (*Larus fuscus*) [A183]	14 km	The Lesser Black-backed Gull has a restricted global breeding range that extends from Iceland east to the Taimyr peninsula and south to Portugal. In the eastern part of the range, the Lesser Black-backed Gull is an Arctic breeding bird, occurring largely in inland areas above the Arctic Circle and especially along major river valleys. In western Europe, Lesser Black-backed Gulls have a largely coastal breeding distribution with colonies occurring only short distances from the coast. The Lesser Black-backed Gull has expanded its range and abundance during much of the 20th century. More recently, some populations have been showing signs of decline though in Ireland numbers have increased. Current national population estimates are 10,363 wintering individuals. 14 SPAs are designated for this species in the Member State.	No – Given the distance between this QI and the Works, no complete source-pathway-receptor chain could be identified. Potential impacts are not anticipated and are, therefore, screened out. Irish Wetland Bird Survey (I-WeBS) records identify the species to be present 14 km downstream of the Site. Highly unlikely SCI will be within proximity.
little tern (*Sterna albifrons*) [A195]	14 km	The little tern has a widely scattered global distribution. Its distribution is essentially coastal. The Irish population is mainly found on the west and south-east coasts. The greatest threat to little tern colonies is from human disturbance. Blown sand is also a significant factor causing nest losses. It is believed that little terns declined at many British colonies during the latter part of the 19th century, but then recovered to reach a peak in the 1920s or early 1930s. Thereafter, a renewed serious decline was recorded in 1967. Current national wintering population estimates are 346 individuals. 8 SPAs are designated for this species in the Member State.	
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	14 km	White-fronted geese have a circumpolar distribution, breeding from the eastern Russian Arctic, 4,500 km west to the Bering Strait. They breed discontinuously in Alaska and across high Arctic Canada, as well as in west Greenland. The population of Greenland White-fronted geese is small and their world range limited. Current national wintering population estimates are 12,173 individuals. 29 SPAs are designated for this species in the Member State. The baseline population size in the Wexford Harbour and Slobs SPA is 9,353 individuals.	

3.3 Screening Matrix

Each SCI/QI in each Natura 2000 site is assigned a CO of either restoration or maintenance of its "favourable conservation condition", as described by a set of Attributes with corresponding Targets that must be met if the specific CO for that SCI/QI is to be achieved. The restoration to and maintenance in favourable conservation condition of habitats and species within Natura 2000 sites contributes to the overall conservation status of those habitats and species at a national and European level. Favourable conservation condition is described in more generic terms below.

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 structures and functions necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and,
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- 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.

Site-specific COs for the Slaney River Valley SAC and the Wexford Harbour and Slobs SPA have been published by the NPWS and are listed in full in Appendix B. Where potential pathways of risk exist between the Works and QIs (see Tables 2 and 3), these are examined in view of the relevant COs in the Screening Matrix in Tables 4 and 5. A likely effect of a plan or project is deemed to be significant effect if it corresponds to an adverse impact on any of the COs for the Natura 2000 site. A plan or project has insignificant effects if those effects are inconsequential to the achievement of the site's COs.

Table 4 Screening matrix for COs and detailed attributes and targets of the Slaney River Valley SAC

QI code	Conservation Objective	Attribute	Target	Potential Likely Significant Effect (LSE)
1130	To maintain the favourable conservation condition of Estuaries in the Slaney River Valley SAC	Habitat area	Permanent area stable or increasing, subject to natural processes	No LSE – There is no pathway by which the Works could reduce or limit the permanent area of this habitat type.
		Community distribution	Maintained in or restore to a natural condition: Mixed sediment community complex; Estuarine muds dominated by polychaetes and crustaceans community complex; and, Sand dominated by polychaetes community complex	No LSE – The Works are highly unlikely to significantly alter the condition or distribution of these estuarine community types.
3260	To maintain the favourable conservation condition of watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Slaney River Valley SAC	Habitat distribution	No decline, subject to natural processes	No LSE – There is no pathway by which the Works could lead to a reduction in the distribution of these watercourses.
		Habitat area	Area stable at 12.6 km or increasing, subject to natural processes	No LSE – The Works will not lead to any reduction in habitat area, owing to their scale and distance from the habitat boundary.
		Hydrological regime: river flow	Maintain appropriate hydrological regimes	No LSE – Owing to their small scale, the Works will not affect the hydrological regime.
		Hydrological regime: tidal influence	Maintain natural tidal regime	No LSE – There is no pathway by which the Works could affect tidal influence at the site.
		Substratum composition: particle size range	For the tidal sub-type, the substratum of the channel must be dominated by particles of sand to gravel, with silt at the river margins	No LSE – Owing to their small scale, the Works are unlikely to affect particle size range.
		Water quality: nutrients	The concentration of nutrients in the water column must be sufficiently low to prevent changes in species composition or habitat condition	No LSE – Owing to their small scale, the Works are unlikely to affect nutrient concentrations.
		Vegetation composition: typical species	Typical species of the relevant habitat sub-type reach favourable status	No LSE – The Works will not affect vegetation composition in terms of typical species.
		Floodplain connectivity: area	The area of active floodplain at and upstream of the habitat must be maintained	No LSE – Owing to their scale, the Works will not impact on the area of the floodplain.
1095	To restore the favourable conservation condition of Sea lamprey in the Slaney River Valley SAC	Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No LSE – Owing to the incorporation of a rock ramp as a major element of the Works, it is anticipated that passage of lamprey at Glebe Bridge will be increased.

QI code	Conservation Objective	Attribute	Target	Potential Likely Significant Effect (LSE)
		Population structure of juveniles	At least 3 age/size groups present	No LSE – There will be no significant effect on population structure as a result of the Works.
		Juvenile density in fine sediment	Juvenile density at least 1 m^{-2}	No LSE – There will be no significant change to juvenile density as a result of the Works.
		Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds; improved dispersal of spawning beds into areas upstream of barriers	**LSE – Direct physical damage to potential/suitable spawning beds as a result of the Works. In addition, no historical data on which to base an accurate assessment.**
		Availability of juvenile habitat	More than 50% of sites sampled in 3rd order (or greater) channels downstream of spawning sites positive for juvenile habitat	No LSE – The Works will not result in a decrease in the availability of juvenile habitat.
1096	To restore the favourable conservation condition of Brook lamprey in the Slaney River Valley SAC	Distribution	Access to all water courses down to 1st order streams	No LSE – Owing to the incorporation of a rock ramp as a major element of the Works, it is anticipated that passage of lamprey at Glebe Bridge will be increased.
		Population structure of juveniles	At least 3 age/size groups present	No LSE – There will be no significant effect on population structure as a result of the Works.
		Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2 m^{-2}	No LSE – There will be no significant effect on the density of juveniles as a result of the Works.
		Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	**LSE – There is likely to be direct physical damage to potential/suitable spawning beds as a result of the Works. There are no historical data on which to base an accurate assessment.**
		Availability of juvenile habitat	More than 50% of sites sampled in 2nd order (or greater) channels downstream of spawning sites positive for juvenile habitat	No LSE – The Works will not result in a decrease in the availability of juvenile habitat.
1099	To restore the favourable conservation condition of River lamprey in the Slaney River Valley SAC	Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No LSE – Owing to the incorporation of a rock ramp as a major element of the Works, it is anticipated that passage of lamprey at Glebe Bridge will be increased.
		Population structure of juveniles	At least 3 age/size groups present	No LSE – There will be no significant effect on population structure as a result of the Works.
		Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2 m^{-2}	No LSE – There will be no significant effect on the density of juveniles as a result of the Works.

QI code	Conservation Objective	Attribute	Target	Potential Likely Significant Effect (LSE)
		Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	**LSE – There is likely to be direct physical damage to potential/suitable spawning beds as a result of the Works. There are no historical data on which to base an accurate assessment.**
		Availability of juvenile habitat	More than 50% of sites sampled in 2nd order (or greater) channels downstream of spawning sites positive for juvenile habitat	No LSE – The Works will not result in a decrease in the availability of juvenile habitat.
1106	To restore the favourable conservation condition of Atlantic salmon in the Slaney River Valley SAC	Distribution: extent of anadromy	100% of river channels down to 2nd order accessible from estuary	No LSE – Owing to the incorporation of a rock ramp as a major element of the Works, it is anticipated that passage of salmon (if it currently exists) at Glebe Bridge will be increased.
		Number of adult spawning fish	Conservation Limit for each system consistently exceeded	No LSE – The Works will not significantly affect the numbers of spawning adult fish in the SAC.
		Fry abundance	Maintain or exceed mean catchment-wide 0+ fry abundance threshold (17 fry per 5-min sample)	No LSE – Owing to the scale of the Works, they are unlikely to affect mean catchment-wide fry abundance.
		Smolt abundance	No significant decline	No LSE – The Works are unlikely to significantly affect out-migrating smolt abundance.
		Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	**LSE – The Works may lead to a decline in the number or distribution of redds upstream of Glebe Bridge. There are no historical data on which to base an accurate assessment.**
		Water quality	At least Q4 at all sites sampled by EPA	No LSE – Appropriate site management will ensure that there will be no change to water quality as a result of the Works.
1355	To restore the favourable conservation condition of European Otter in the Slaney River Valley SAC	Distribution	No significant decline	No LSE – ROD-AECOM (2016a) found no natural features likely to be used by Otter for breeding or resting within 150 m of Glebe Bridge. There will be no significant decline in the distribution of Otters as a result of the Works.
		Extent of terrestrial, freshwater and marine habitat	No significant decline	No LSE – There will be no significant decline in Otter habitat as a result of the Works.
		Couching sites and holts	No significant decline	No LSE – There will be no significant loss of couching sites or holts as a result of the Works.
		Fish biomass available	No significant decline	No LSE – Available fish biomass will not be significantly affected as a result of the Works.

QI code	Conservation Objective	Attribute	Target	Potential Likely Significant Effect (LSE)
		Barriers to connectivity	No significant increase	No LSE – There will be no significant increase in barriers to connectivity as a result of Works. These are considered short-term and restricted to daylight hours.

Table 5 Screening matrix for COs and detailed attributes and targets of the Wexford Harbour and Slobs SPA

SCI codes	Conservation Objective	Targets	Potential likely significant effect (LSE)
A004, A017, A028, A052, A053, A125, A142, A160, A179	To maintain the favourable conservation condition of the species in Wexford Harbour and Slobs SPA Attributes: Population Trend and Distribution	• Long-term population trend stable or increasing • There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	No LSE – The study area is not in direct proximity to areas used by significant concentrations of QIs. The scope of temporary refurbishment Works on disturbance to QIs at this location are likely to be trivial and inconsequential with regard to an impact on the long-term population trends of QIs within the site or result in a significant decrease in their numbers or the range of areas used.

3.4 Abiotic Changes to the Site

In addition to identifying pathways of risk between the Works and the SCIs/QIs of the Natura 2000 sites (Tables 2 and 3) and assessing the likely significant effects of the Works on the sites' COs (Tables 4 and 5), it was deemed prudent, considering that the River Slaney and its tributaries constitute the major structural element of the sites, to assess the possibility of abiotic changes to the river arising from the Works. This was undertaken following guidance from Scottish Natural Heritage (SNH) on dealing with proposals affecting freshwater SACs (SNH, 2006) and the results are shown in Table 6 below.

Table 6 Likely direct and indirect effects of elements of a project or plan that could trigger progression to Stage 2 (AA). Modified from SNH (2006).

Direct effects	Likelihood
Will the qualifying feature be disturbed, damaged, destroyed, altered or lost to any extent as a result of the Works?	**Yes**
Indirect effects	**Likelihood**
River flow	
Will the Works affect the flow?	**Yes**
Will the velocity be changed or the flow diverted?	**Yes**
Will the quantity of water be affected?	No
Will the flow regime change so that the river responds more quickly?	No
Will summer flows be changed (altering water temperatures and oxygen levels) or will winter floods be altered?	No
Channel substrate	
Will the Works affect the substrate?	**Yes**
Will there be physical damage/disturbance to the habitat structure?	**Yes**
Will the diversity of channel morphology be reduced?	**Yes**
Will the Works affect the river sediments?	**Uncertain**
Will the Works lead to changes in the nature of river bed sediments?	**Uncertain**
Water quality	
Will the Works affect water quality?	No
Will oxygen levels be altered?	No
Will water chemistry be changed?	No
Is there additional risk of accidental pollution?*	Yes*
Will the Works increase the water turbidity?	No
Will water temperature be changed?	No

*It is considered that straightforward generic best practice mitigation (IFI, 2016) will be incorporated into construction-phase elements of the Project to avoid "additional risk of accidental pollution".

4.0 CONCLUSIONS OF STAGE 1 (SCREENING)

On the basis of the Screening assessment above and in applying the Precautionary Principle, indicators of significance show that there is the potential for localised short-term or long-term interference with the Slaney River Valley Special Area of Conservation. It has been concluded that potentially significant or uncertain effects on Qualifying Interests and their respective Conservation Objectives are likely to arise from the construction and operational phases of the proposed refurbishment works to Glebe Bridge. Conversely, it has been concluded that there are unlikely to be any significant effects on the Special Conservation Interests of the Wexford Harbour and Slobs Special Protection Area.

4.1 Progression to Stage 2 (Appropriate Assessment)

The Screening determined that an Appropriate Assessment of the Works is required as it cannot be excluded, on the basis of objective information, that the Works, either on their own or in combination with other plans and projects, will not have a significant effect on the Slaney River Valley Special Area of Conservation.

The rationale for such a determination has regard to the structure and function of features of interest at Natura 2000 sites, notably in this case that:

- Areas of habitat important for the survival of the Qualifying Interests within the River Slaney SAC will be modified, fragmented, destroyed or isolated; and,
- A potentially meaningful proportion of the Qualifying Interests of the River Slaney SAC may be impacted through loss, damage or deterioration in habitat quality.

Therefore, the process must proceed to Stage 2: Appropriate Assessment (with the provision of a Natura Impact Statement).

As it can be concluded that there are unlikely to be such effects on the Wexford Harbour and Slobs Special Protection Area, Stage 2: Appropriate Assessment (with the provision of a Natura Impact Statement) shall not be required with regard to this Natura 2000 site.

4.2 Purpose of the Natura Impact Statement

The Natura Impact Statement shall identify, in light of the best scientific knowledge in the field, all aspects of the Works that have the potential, either individually or in combination with other plans and projects, to affect the Slaney River Valley Special Area of Conservation in the context of its Conservation Objectives. In order to facilitate the competent authority (in this case, An Bord Pleanála) in its Appropriate Assessment of the proposed Works, the Natura Impact Statement must contain complete, precise and definitive findings and include an examination, analysis, evaluations, findings, conclusions and a final determination.

5.0 IMPACT PREDICTION

5.1 Types of Impacts Arising from the Works

Potential significant impacts on habitats and species of conservation importance for Natura 2000 sites screened in during Stage 1 are examined, analysed and evaluated in this section. The types of impact identified, *e.g*. direct and indirect impacts, short- and long-term impacts, construction- and operational-phase impacts *etc*. arising from the Works are assessed in light of the COs set out for the QIs of those Natura 2000 sites.

Significant short-term impacts are predicted on a number of QIs for which the Slaney River Valley SAC is designated through the proposed works. These predicted impacts fall into four categories:

- Damage and disturbance or loss of habitat;
- Habitat degradation, e.g. sedimentation;
- Temporary barriers to connectivity; and,
- Short-term disturbance (*e.g*. noise, vibration and visual).

Significant long-term impacts are predicted on QIs of the River Slaney SAC are also anticipated to arise during the operational-phase of the Works, in the absence of mitigation. These predicted impacts fall into three categories:

- Permanent loss of habitat; and,
- Additional barriers to connectivity.

Sections 5.2–5.4 provide a detailed analysis and evaluation of each of these predicted impact types with regard to their likely effects on the QIs of the Slaney River Valley SAC, in light of their COs, and, consequently, the ability of the site to maintain its structure and function.

5.2 Predicted Impacts on Sea lamprey and Brook/River lamprey

Physical and chemical barriers to migration from the sea/estuaries and lower reaches of rivers to upstream spawning sites pose significant threats to all three lamprey species found in Britain and Ireland (Maitland, 2003). The creation of new barriers to the migration of lamprey in Natura 2000 catchments constitutes a significant negative effect on the function of the network. In-stream works and poorly designed watercourse crossings can act as significant barriers to the movement of lamprey (King *et al*., 2008a). In-stream excavations and other construction activities can also impact on lamprey through increases in suspended solids, disturbance and smothering of spawning beds and juvenile habitat (King *et al*., 2008a).

One element of the Works deemed likely to have significant effects on the COs for lamprey species in the River Slaney SAC is the modification of the riverbed downstream of the bridge. Dewatering and excavation of the stream below the bridge does not pose an additional barrier to migration as it will be timed, in consultation with IFI, to avoid the main lamprey migration period. In the absence of appropriate mitigation measures, significant effects on this species through damage/disturbance to individuals are anticipated during the Works.

During an on-site meeting between ROD-AECOM and IFI, juvenile brook/river lamprey were observed immediately downstream of the bridge (IFI, pers. comm.). Disturbance to suitable spawning and juvenile habitat is likely as a result of the Works.

Construction also creates the potential for habitat degradation downstream of the construction site through accidental input of sediment and/or construction material(s) into the watercourse. Pressure-grouting and resin-injection pose particular threats to the quality of the freshwater environment as the materials used are highly alkaline and, thus, can cause harm to fish. In addition, it is not always possible to predict if/where these materials will leak through cracks and fissures in the bridge structure into the watercourse during injection. However, IFI (2016) contains best practice guidelines in relation to this issue and their inclusion in the Methods Statement will prevent any significant impacts of sedimentation/pollution on habitat quality.

Works during the construction phase, have the potential to lead to direct mortality of individuals (migrating/spawning adults or intra-gravel larvae) if they are not removed prior to dewatering and also provides for a temporary loss of habitat and barrier to migration for the duration of the works. The short-term habitat loss and barrier to migration, however, are not considered to be significant impacts given the provision of an adequate fish rescue campaign which is integral to the Works methodology.

Therefore, it is considered that the construction and operation of the Project, in the absence of appropriate mitigation measures, would be likely to have significant direct and indirect negative impacts on Sea lamprey and brook/river lamprey in close proximity and with connectivity to the Slaney River Valley SAC.

5.3 Predicted Impacts on Atlantic salmon

As with lamprey species, anthropogenic barriers to migration are one of the most significant threats to the long-term viability of Atlantic salmon populations in many river catchments (Hendry & Cragg-Hine, 2003) and, consequently, the function of the Natura 2000 network with regard to the conservation of this species. Such barriers can be either physical, *e.g*. weirs or bridge aprons, or chemical, *e.g*. pollution, and the magnitude of their effects can be dependent on factors such as timing (King, 2007). In-stream works can act as barriers to migration and can also lead to other impacts, such as increases in suspended solids, removal of pools and disturbance to individuals in the intra-gravel life stage (King, 2007).

During the construction phase, habitat important for Atlantic salmon in Edermine Stream will be dewatered and excavated to allow the laying of the bed reinforcement and rock ramp units. This constitutes a temporary loss of habitat and barrier to connectivity for the duration of the works. The short-term habitat loss and migration barrier, however, are not considered to be significant impacts as the construction will take place outside of the main migration period.

Given the extensive in-stream activities included as part of the Works, disturbance to early life-stages, *i.e*. parr and smolts, during the Works is predicted, in the absence of appropriate mitigation measures, to lead to significant effects on salmon.

Construction also creates the potential for habitat degradation downstream of the construction site through accidental input of sediment and/or construction material(s) into the watercourse. As with lamprey species, pressure-grouting and resin-injection are of particular concern with regard to the pollution of Edermine Stream and harm to Atlantic salmon in the event that grout and/or resin leak through the structure and into the stream during injection. However, it is predicted that the best practice control measures outlined in IFI (2016) and to be included in the Method Statement will prevent any significant impacts of sedimentation/pollution on habitat quality.

Therefore, it is considered that the construction and operation of the Works, in the absence of appropriate mitigation measures, would be likely to have significant direct and indirect negative impacts on Atlantic salmon in close proximity and with direct connectivity to the River Slaney SAC, thereby constituting a potentially significant indirect threat the function of the site, as defined by its COs.

5.4 Summary of Predicted Impacts

The impacts predicted on the QIs of the Slaney River Valley SAC arising from the Works, as detailed above, are summarised in Table 7 below.

Table 7 Predicted Impacts on the QIs of the Slaney River Valley SAC arising from the Woks

Species	Construction-phase Impacts				Operational-phase Impacts		
	Habitat loss	Habitat degradation	Barrier(s) to connectivity	Disturbance	Habitat loss	Barrier(s) to connectivity	Disturbance
Sea lamprey and Brook/River lamprey	Yes*	Yes*	Yes*	**Yes**	No	No	No
Atlantic salmon	Yes*	Yes*	Yes*	**Yes**	No	No	No

*Temporary impacts that will not give rise to significant effects given adherence to best practice control measures and restrictions on in-stream activities from 1st October to 30th June, inclusive (IFI, 2016).

6.0 CONSIDERATION OF POTENTIAL CUMULATIVE IMPACTS

6.1 Legislative Context

A key requirement of the Habitats Directive is to determine whether the Project is likely to have a significant effect when considered in combination with other plans and projects. The main driver for addressing plans in combination is to ensure that cumulative effects are captured. For example, the effects of a plan on water quality may be insignificant when considered alone, but when combined with the effects of increased pollution from other plans or projects, may lead to significant adverse impacts on site integrity. To that end, the "in-combination test" is about addressing "cumulative effects".

Determining which plans and projects to consider requires a pragmatic approach given the nature and scale of development; proximity to Natura 2000; and the potential pathways of risk. Current best practice and available guidance suggests a staged approach, as follows:

- if it can be clearly demonstrated that the plan will not result in any effects at all that are relevant to European site integrity, then the plan should proceed without considering the in-combination test requirement in the Screening further; or,
- if there are identified effects arising from the plan, even if they are perceived as minor and not likely to have a significant effect on the European site alone, then these effects must be considered in combination with the effects arising from other plans and projects.

Individual elements of a project or plan for which there is predicted be no effects at all or inconsequential effects on the European site or because those elements are too general in nature do not require an in-combination assessment since, clearly, they will either have no cumulative effects or cumulative effects cannot be identified.

In the case of the proposed Works at Glebe Bridge, especially the replacement of the existing riverbed with a rock ramp fish pass, the Works provide for potentially significant adverse effects on species listed as QIs of the River Slaney SAC. Therefore, an assessment of the potential cumulative impacts of the Project with other plans or projects in the likely zone of impact must be undertaken.

6.2 Sources of Information

In order to identify other plans and projects under construction or committed to in the Wexford County Development Plan 2013–2019 (WCC, 2012) within the likely zone of impact of the Works, searches of the following documents and websites were carried out:

- *Draft Wexford County Development Plan 2013–2019* (WCC, 2012)
- *iMAPs – Maps of Wexford* <https://maps.wexford.ie/imaps/> (WCC, 2016)
- *Road Scheme Activity* <http://www.tii.ie/projects/road-schemes/> (TII, 2016)
- *Projects* <http://www.eirgridgroup.com/the-grid/projects/> (EirGrid, 2016)

The results of these searches and the likely cumulative impacts of the Works with plans and projects identified thereby are discussed in detail in the following sections.

6.3 Water and Wastewater Services Projects

The Enniscorthy Main Drainage Scheme Stage 3 involves upgrading the existing wastewater treatment plant and the associated sewer network to treat effluent from Enniscorthy town and its environs. As this project will have no negative impact on water and general habitat quality in the River Slaney or the Edermine Stream System (Barry & Partners, 2007), it is concluded that there will be no cumulation of effects with the proposed Works.

No other water or wastewater services projects were identified within or in close proximity to the likely zone of impact of the proposed Works in the search of the documents and websites listed above or in general web searches.

6.4 National Roads Projects

A review of the interactive map of current road schemes on the TII website (TII, 2016) found one scheme within the likely zone of impact of the proposed Works: the M11 Gorey to Enniscorthy Scheme. This scheme includes *c*. 28 km of new motorway from the end of the Gorey Bypass to the townland of Scurlockbush, south of Enniscorthy. It also includes an 8 km bypass (N30) to the west of Enniscorthy and a 4 km link road that will connect the N80 to the new M11. It will bypass Ferns, Camolin and Enniscorthy and incorporate a new crossing of the River Slaney north of Enniscorthy. The southern end of the scheme will pass *c*. 1.2 km to the east of the proposed Works and will cross watercourses (streams and drainage ditches) that form part of the Edermine Stream System.

The scheme is likely to require the diversion and culverting of a number of small watercourses connected to Edermine Stream. This potentially provides for impacts on lamprey species and Atlantic salmon through direct disturbance, loss of spawning beds and habitat degradation downstream through sedimentation and pollution. However, owing to the very small size of those streams and unsuitability of drainage ditches for spawning, it is deemed unlikely that the scheme will have any significant effects through disturbance to individuals or loss of spawning beds. Furthermore, as established in case law (see Section 1.4), it is reasonable to assume that generic best practice control measures will be employed in the construction of the scheme and that this will prevent any significant effects on watercourses through either sedimentation or pollution. As no significant impacts on the lamprey species and Atlantic salmon in the Edermine Stream system arising from the M11 Gorey to Enniscorthy Scheme can be identified, the possibility cumulative impacts of the scheme with the proposed Works can be excluded at this stage.

No other national road schemes were identified within or in close proximity to the likely zone of impact of the proposed Works either through searches of the TII and Wexford County Council websites or general web searches.

6.5 Energy Infrastructure Projects

Neither the Draft County Development Plan (WCC, 2012) nor EirGrid's website contained any commitment to realising major energy infrastructure projects within the likely zone of impact or a 15 km radius of the proposed Works. Furthermore, no wind farms or other major renewable energy projects were identified within the likely zone of impact (WCC, 2012).

6.6 Planning Applications

A search of *iMAPs – Maps of Wexford* (WCC, 2016) found no plans or projects of a nature or of a sufficient scale such that they would have the potential to give rise to cumulative impacts with the Works. All of the planning applications found were for small-scale developments such as extensions to private dwellings and installations of septic tanks.

6.7 Conclusion

This cumulative impact assessment has not identified any water and/or wastewater services, national roads or energy infrastructure projects or plans or projects of any other kind that would be likely to give rise to significant effects in combination with the Works. As it has been determined that there are unlikely to be any significant adverse effects arising from the cumulation of the Works with any other project or plan or any combination of other projects or plans, no specific measures are proposed to mitigate for any such impacts.

7.0 MITIGATION OF IMPACTS

The significant impacts predicted in Section 5.0 require appropriate mitigation measures to be minimised such that they will not lead to significant effects on the Slaney River Valley SAC in light of its COs. Section 7.0 recommends mitigation measures for each of the QIs considered likely to be affected by the Works. The measures outlined in the following sections are recommended in light of significant effects likely to arise from the Works where impacts are predicted.

7.1 Mitigation for Sea lamprey and Brook/River lamprey

The impact of temporary habitat loss for sea lamprey and brook/river lamprey during the construction phase has the potential to give rise to significant effects on these three species. However, provided that works are restricted to the period from 1st July to 30th September, as stipulated by IFI (2016) and outlined in NRA (2008), any effect of such short-term habitat loss on lamprey species will be insignificant. Furthermore, prior to construction, electrofishing shall be undertaken to remove any individuals from the area to be dewatered.

The short-term impact of the additional barrier to migration/connectivity for sea lamprey and brook/river lamprey resulting from the dewatering and overpumping of Edermine Stream in order to facilitate the construction of the rock ramp pass is deemed unlikely to have a significant effect on these species given that it will not be in place during the migration period. Therefore, no specific mitigation measures other than standard best practice (IFI, 2016) are required in the case of this effect.

The potential for habitat degradation through input of sediment and/or construction material(s) into Edermine Stream during the Works shall be managed by strict adherence to standard best practice guidance, *i.e*. IFI (2016) and NRA (2008). Particular attention shall be paid to Section 10.4 of IFI (2016), which states the following: "During grout injection, at least one member of a repair crew should be closely monitoring for grout losses both upstream and downstream of the structure. Portable pH monitoring facilities should always be available and staff trained in its use."

There are not predicted to be any significant long-term effects on any of the three lamprey species as a result of the Works. Therefore, no specific measures to mitigate for long-term effects on these species are proposed.

7.2 Mitigation for Atlantic salmon

There will be a barrier to migration of Atlantic salmon during the time that Edermine Stream will be dewatered to facilitate construction. However, given that the works will be restricted to the period from 1st July to 30th September, inclusive, this is unlikely to give rise to a significant effect on this species as the works period is during the period of least sensitivity for migrating fish. Furthermore, before the stream is dewatered, electrofishing shall be undertaken to remove any individuals from the area prior to commencement of in-stream activities. This will have the additional mitigating effect of preventing any mortality of juvenile salmon present in the stream at the time of construction.

The potential for habitat degradation through input of sediment and/or construction material(s) into Edermine Stream during the Works shall be managed by strict adherence to standard best practice guidance, *i.e*. IFI (2016) and NRA (2008). As for lamprey species, particular attention shall be paid to Section 10.4 of IFI (2016).

There are not predicted to be any significant long-term effects on Atlantic salmon as a result of the Works. Therefore, no specific measures to mitigate for any long-term effects on these species are proposed.

7.3 Mitigation for Sedimentation/Erosion

In light of the potential abiotic changes to Edermine Stream as a result of sedimentation and erosion during the construction stage (see Table 6), it is considered prudent to require the

Contractor to prepare and implement a Construction Erosion and Sediment Control Plan (CESCP). This plan shall include the following elements:

1. Limiting of site works to the minimum area and timescale required to undertake the necessary elements of the Works;
2. Formulation of a Dust Minimisation Plan for the Works;
3. Direction of site drainage through a settlement facility prior to discharge and provision of temporary facilities to trap any accidental spillage;
4. A Method Statement for the Works to be submitted to IFI to ensure that the proposed methods satisfy fisheries requirements;
5. Promotion of awareness of the importance of site management and the freshwater environment amongst site personnel; Toolbox talks to be given by a qualified ecologist to all contractor personnel.
6. Restriction of topsoil stripping near Edermine Stream to dry weather conditions;
7. Pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents *etc*. to be completed in the dry;
8. Storage of oils, fuel, chemicals, hydraulic fluids *etc*. to be located at least 100 m from the stream on an impervious base within a bund and appropriately secured; and,
9. All machinery operating near the stream to be steam-cleaned in advance of Works and routinely checked to ensure no leakage of oils or lubricants and all fuelling of machinery to be undertaken a minimum of 100 m from watercourses.

It is considered that the implementation of such a CESCP will mitigate against any residual adverse effects arising from the Works on the integrity of the Slaney River Valley SAC in terms of its structure and function.

8.0 CONCLUSIONS

The Natura Impact Statement has shown, in light of the best scientific knowledge in the field, that the proposed refurbishment works at Glebe Bridge, individually but not in combination with other plans or projects, provide for localised short- and long-term interference with the Slaney River Valley Special Area of Conservation. It has been concluded that, in the absence of appropriate mitigation measures, significant adverse effects on the Qualifying Interests of the Slaney River Valley Special Area of Conservation and their respective Conservation Objectives are likely to arise from the refurbishment works.

The likely significant effects of the proposed Works on the Slaney River Valley Special Area of Conservation are limited to input of sediment and/or construction material(s) and short-term (construction-phase) disturbance of the following Qualifying Interests of the site:

- Sea lamprey *Petromyzon marinus*;
- Brook lamprey *Lampetra planeri*;
- River lamprey *Lampetra fluviatilis*; and,
- Atlantic salmon *Salmo salar*.

The Natura Impact Statement has proposed appropriate mitigation measures intended to eliminate these effects or, where this is not possible, to minimise these effects such that they can no longer be judged to be significant. These measures include:

- Removal of individuals of those species listed above by electrofishing from the area to be dewatered prior to the commencement of construction; and,
- Implementation of a Construction Erosion and Sediment Control Plan.

Any residual effects remaining after the implementation of the mitigation measures proposed have been assessed as being insignificant in light of the site's Conservation Objectives.

Having had due regard to all current guidance on the assessment of plans and projects that would be likely to have significant effects on Natura 2000 sites and having prepared the Screening for Appropriate Assessment report and this Natura Impact Statement, it has been concluded that the proposed refurbishment works and installation of a rock ramp fish pass at Glebe Bridge, either on their own or in combination with other plans and projects and given strict adherence to best practice guidelines and implementation of the mitigation measures proposed, would be unlikely to give rise to any direct or indirect significant effects on the Slaney River Valley Special Area of Conservation or any other Natura 2000 site for nature conservation.

9.0 REFERENCES

Barry & Partners (2007) *Enniscorthy Main Drainage Stage 3: Environmental Impact Statement – Vol. 1*. Report by J.B. Barry & Partners Ltd., Dublin for Wexford County Council, Wexford.

Chanin, P. (2003) Ecology of the European Otter. *Conserving Natura 2000 Rivers Ecology Series* 10. English Nature, Peterborough.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Official Journal of the European Communities, *L206/7*.

DEHLG (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin.

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive). Official Journal of the European Union, *L20/7*.

EC (2000) *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission.

EC (2001) *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission.

EC (2007) *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 European Commission.

Eionet (2015) *Population status and trends at the EU and Member State levels: 2008–2012. Article 17 Assessments* <http://bd.eionet.europa.eu/article17/> [Accessed 16/12/2015]. European Topic Centre on Biological Diversity.

EirGrid (2016) *Projects* <http://www.eirgridgroup.com/the-grid/projects/> [Accessed 22/08/2016]. EirGrid Group, Dublin.

European Communities (Birds and Natural Habitats) Regulations 2011. *SI No. 477/2011*.

Fossitt, J. (2000) *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.

Foster-Turley, P., Macdonald, S.M. & Mason C.F. (eds.) (1990) *Otters: An Action Plan for their Conservation*. International Union for the Conservation of Nature and Natural Resources (Species Survival Commission) Otter Specialist Group.

Hendry, K. & Cragg-Hine, D. (2003) Ecology of the Atlantic salmon. *Conserving Natura 2000 Rivers Ecology Series* 7. English Nature, Peterborough.

IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*. Inland Fisheries Ireland, Dublin.

King, J.J. and Linnane, S.M. (2004) The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs. *Irish Wildlife Manuals* 14. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

King, J.J. (2007) Ecological Impact Assessment (EcIA) in relation to Atlantic salmon in Special Areas of Conservation and potential for impact of OPW's channel maintenance work. *Series of Ecological Assessments on Arterial Drainage Maintenance* 3. Environment Section, Office of Public Works, Headford.

King, J.J., Hanna, G. & Wightman, G.D. (2008a) Ecological Impact Assessment (EcIA) of The Effects of Statutory Arterial Drainage Maintenance Activities on Three lamprey species (*Lampetra planeri* Bloch, *Lampetra fluviatilis* L., and *Petromyzon marinus* L.). *Series of Ecological Assessments on Arterial Drainage Maintenance* 9. Environment Section, Office of Public Works, Headford.

Maitland, P.S. (2003) Ecology of the River, Brook and Sea lamprey. *Conserving Natura 2000 Rivers Ecology Series* 5. English Nature, Peterborough.

Moorkens, E.A. (1995) *Mapping of proposed SAC rivers for* Margaritifera margaritifera*. Volumes 1 & 2.* Unpublished report for National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

Moorkens, E.A. (2000) Conservation Management of the Freshwater Pearl Mussel *Margaritifera margaritifera*. Part 2: Water Quality Requirements. *Irish Wildlife Manuals* 9. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2009) *Threat Response Plan: Otter (2009-2011)*. National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

NPWS (2010) *Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Department of Environment, Heritage and Local Government, Dublin.

NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland*. Volumes 2 & 3: Article 17 Assessments. Department of Arts, Heritage and the Gaeltacht, Dublin.

NPWS (2016) *Online Map Viewer* <http://webgis.npws.ie/npwsviewer/> [Accessed 05/12/2015]. Department of Arts, Heritage and Gaeltacht, Dublin.

NRA (2006) *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*. National Roads Authority, Dublin.

NRA (2008) *Guidelines for Crossing Watercourses during the Construction of National Road Schemes*. National Roads Authority, Dublin.

Paul Johnston Associates (2010) *Review of the River Slaney salmon Fishery with Proposed Measures for Conservation and Recovery*. Report for Slaney River Trust, Greystones and Inland Fisheries Ireland, Dublin.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. and Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. *Irish Wildlife Manuals* 76. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

ROD-AECOM (2016a) *Carlow & Wexford Bridges Rehabilitation Contract. Refurbishment of Glebe Bridge WX-N11-003.00. Ecological Impact Assessment (EcIA).* Report by Roughan & O'Donovan-AECOM Alliance for Kildare County Council.

ROD-AECOM (2016b) *Carlow & Wexford Bridges Rehabilitation Contract. Refurbishment of Glebe Bridge WX-N11-003.00. Invasive Alien Species Risk Assessment.* Report by Roughan & O'Donovan-AECOM Alliance for Kildare County Council.

RHWSP and Scott Cawley (2013) *M11 Gorey to Enniscorthy Scheme: Environmental Impact Statement – Vol. 1 (Non-technical Summary)*. Report by Ryan Hanley-WSP Group Ltd., Galway and Scott Cawley Ltd., Dublin for Wexford County Council, Wexford.

Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Kilkenny.

SNH (2006) *Guidance for Competent Authorities when dealing with proposals affecting SAC freshwater sites*. Scottish Natural Heritage, Perth.

TII (2016) *Road Scheme Activity* <http://www.tii.ie/projects/road-schemes/> [Accessed 22/08/2016]. Transport Infrastructure Ireland, Dublin.

WCC (2012) *Wexford County Development Plan 2013–2019 (Draft)*. Wexford County Council, Wexford.

WCC (2016) *iMAPs – Maps of Wexford* <https://maps.wexford.ie/imaps/> [Accessed 22/08/2016]. Wexford County Council, Wexford.

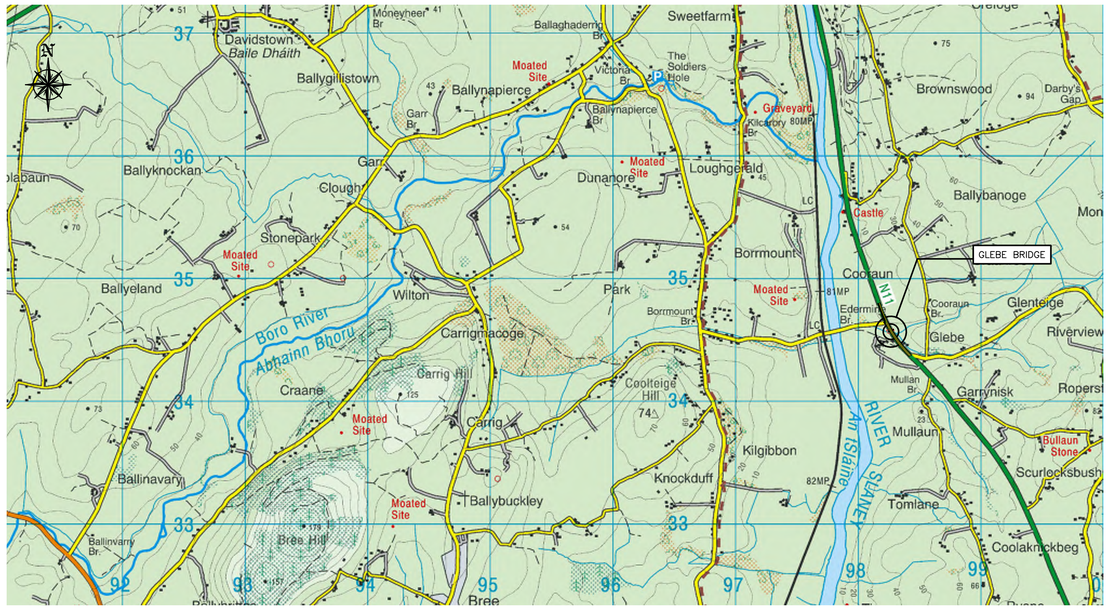
APPENDIX A
Drawings of the Works

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM AT MALIN HEAD.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. EXTENT OF SITE AND AREA PROVIDED BY THE EMPLOYER EXCLUDES AREA WHICH MAY BE TEMPORARY OCCUPIED SUBJECT TO TRAFFIC SAFETY AND MANAGEMENT AND DIVERSIONS.
5. THE CONTRACTOR IS REQUIRED TO PROVIDE ACCESS THROUGH THE EXTENT OF SITE AND AREA PROVIDED BY THE EMPLOYER IN ACCORDANCE WITH THE SPECIFICATION.
6. THE EXISTING POSITION AND LEVEL OF SERVICES SHOWN TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE PROTECTION TO EXISTING SERVICES.

LEGEND:

SITE EXTENT/AREA PROVIDED BY THE EMPLOYER



SITE LOCATION MAP
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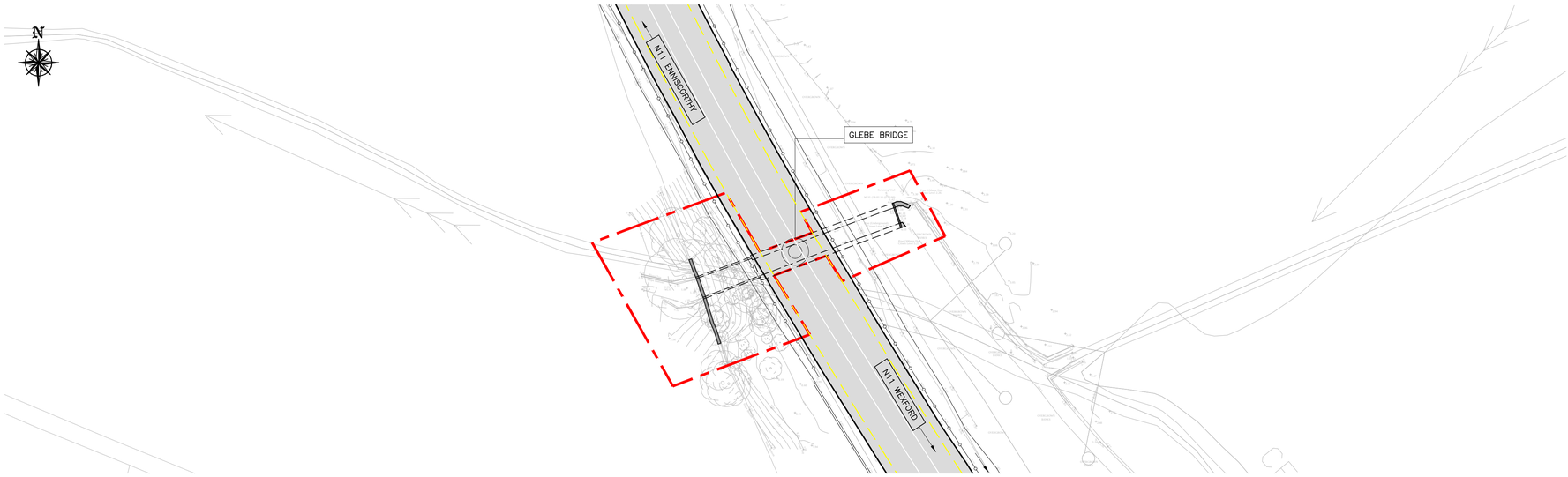
A3 SCALE 1:1000



SITE LAYOUT PLAN
A1 SCALE 1:500
A3 SCALE 1:1000

WEXFORD Co. Co. KILDARE Co. Co. CARLOW Co. Co.

No.	Revision	Date	By	Chk'd	App'd
T0	ISSUED FOR TENDER	29/07/16	OMF	PK	RMJ
	Stage		Date		App'd
	PRELIMINARY				
	APPROVAL				
	TENDER		JULY '16		RMJ
	CONSTRUCTION				

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Designed:	Checked:	Approved:	Status:
PK	RMJ	RMJ	TENDER

Project Title: CARLOW & WEXFORD BRIDGES REHABILITATION CONTRACT

Drawing Title: STRUCTURE No. 5 WX-N11-003.00 GLEBE BRIDGE LOCATION MAP & SITE LAYOUT PLAN

Drawn:	Job No:	Drawing No:	Rev:
OMF	15.135	100-ST05-001	T0
Scale: (A1) AS SHOWN	Date: JUNE 2016		

Jul 29, 2016 - 2:08pm Drawing Location: J:\2015\15135\Dwg\Detailed Design\Part 2\Change Order No. 1\Structure 5 Glebe Bridge\100-ST05-001.dwg

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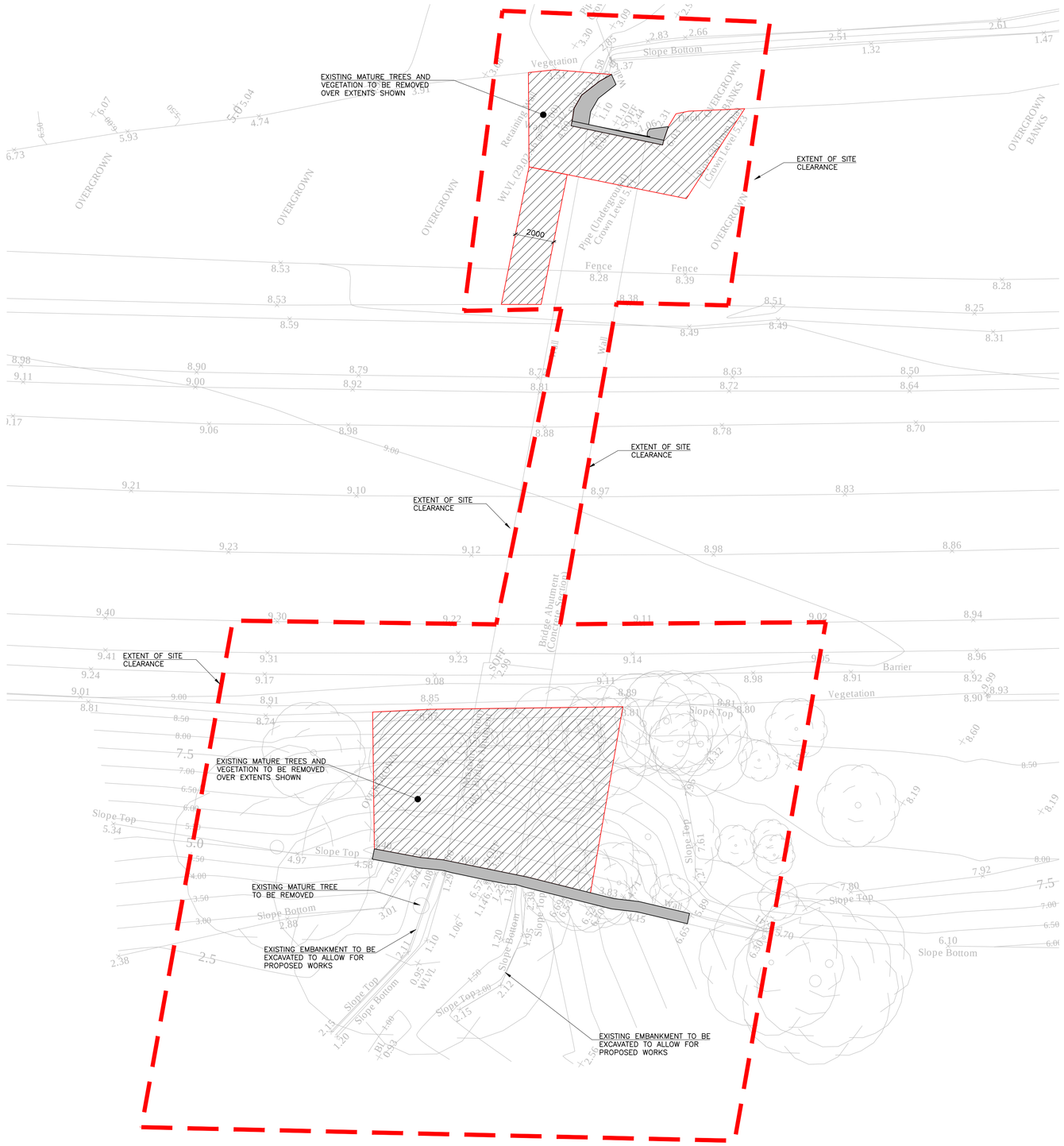

NOTES:

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2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM AT MALIN HEAD.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. WHERE EXISTING BOUNDARY WALLS AND FENCES ARE TO BE TAKEN DOWN TO ALLOW CONSTRUCTION OF PERMANENT WORKS TEMPORARY FENCING TO BE PROVIDED TO PREVENT UNAUTHORISED ACCESS TO SITE AREA AND PRIVATE LANDS.
5. THE CONTRACTOR IS REQUIRED TO PROVIDE ACCESS THROUGH THE EXTENT OF SITE IN ACCORDANCE WITH THE SPECIFICATION.
6. THE CONTRACTOR SHALL LIAISE WITH THE RELEVANT SERVICE PROVIDERS TO AGREE AND IMPLEMENT PROTECTION MEASURES AND DIVERSIONS.
7. WHERE EXISTING LIGHTING AND SIGNAGE IS TO BE TAKEN DOWN TO ALLOW CONSTRUCTION OF THE PERMANT WORKS EQUIVALENT TEMPORARY LIGHTING AND SIGNAGE TO BE PROVIDED FOR THE DURATION OF THE WORKS UNTIL PERMANENT LIGHTING AND SIGNAGE IS REINSTATED OR IN PLACE.

SITE CLEARANCE PLAN

A1 SCALE 1:125
A3 SCALE 1:250

KILDARE NATIONAL ROADS OFFICE
Transport Infrastructure Ireland
WEXFORD Co. Co.
KILDARE Co. Co.
CARLOW Co. Co.

No.	Revision	Date	By	Chk'd	App'd
T0	ISSUED FOR TENDER	29/07/16	OMF	PK	RMJ
	Stage		Date		App'd
	PRELIMINARY				
	APPROVAL				
	TENDER		JULY '16		RMJ
	CONSTRUCTION				

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Designed: PK | Checked: RMJ | Approved: RMJ | Status: TENDER

Project Title: CARLOW & WEXFORD BRIDGES REHABILITATION CONTRACT

Drawing Title: STRUCTURE No. 5 WX-N11-003.00 GLEBE BRIDGE SITE CLEARANCE

Drawn: OMF | Job No: 15.135 | Drawing No: 200-ST05-001 | Rev: T0

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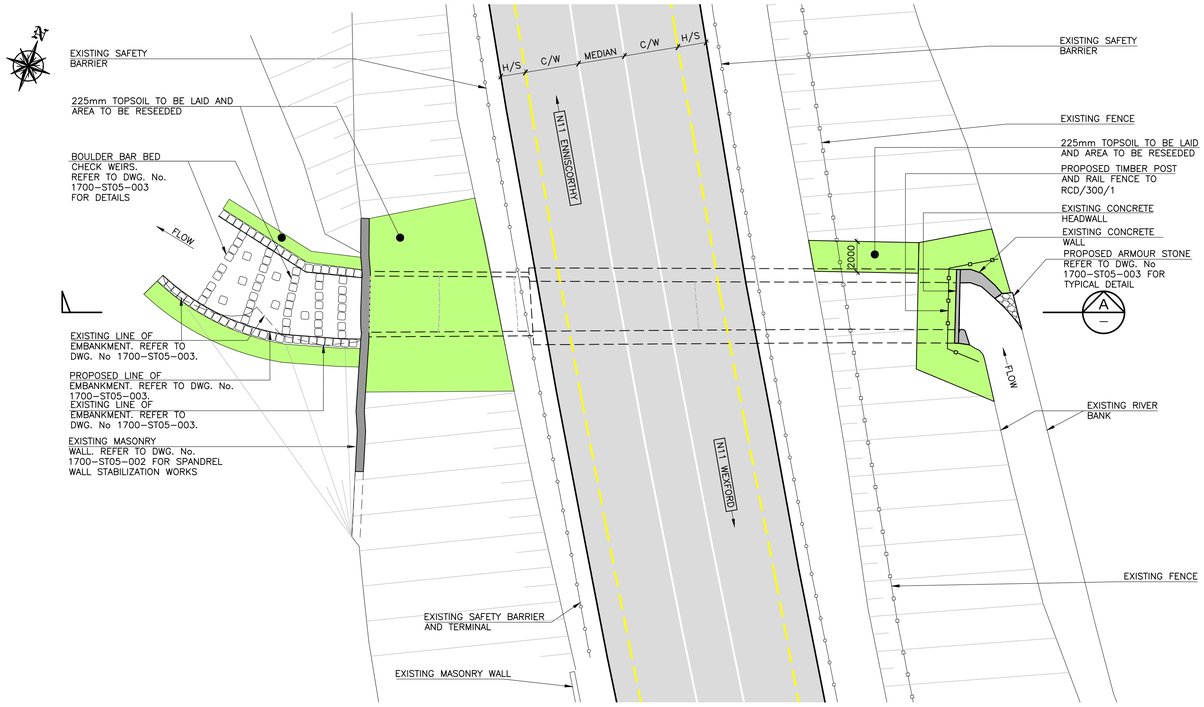
DO NOT SCALE USE FIGURED DIMENSIONS ONLY



PLAN ON BRIDGE SHOWING PROPOSED WORKS

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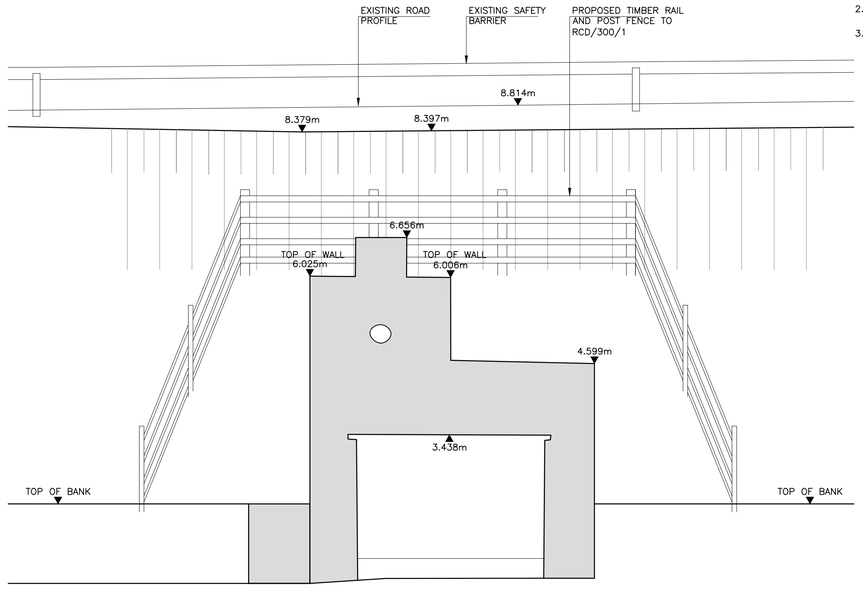
A3 SCALE 1:400

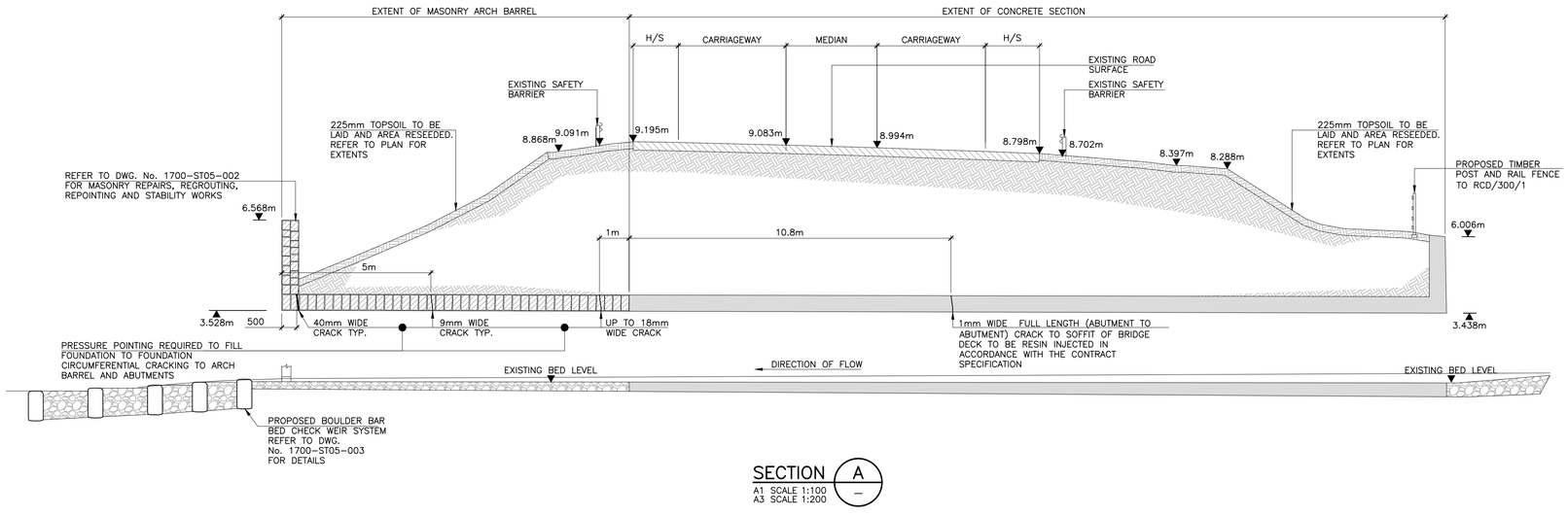


EAST ELEVATION

A1 SCALE 1:50
A3 SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM.
3. ALL CO-ORDINATES ARE IN METRES TO IRISH TRANSVERSE MERCATOR.



SECTION A

A1 SCALE 1:100
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KILDARE nra NATIONAL ROADS OFFICE
TII Bonneagar Iompair Eireann Transport Infrastructure Ireland
Wexford County Council — WEXFORD Co. Co.
KILDARE Co. Co.
CARLOW COUNTY COUNCIL — CARLOW Co. Co.

No.	Revision	Date	By	Chk'd	App'd
T0	ISSUED FOR TENDER	29/07/16	OMF	PK	RMJ
	Stage		Date		App'd
	PRELIMINARY				
	APPROVAL				
	TENDER		JULY '16		RMJ
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Website : www.rod.ie
www.aecom.com

Designed:	Checked:	Approved:	Status:
PK	RMJ	RMJ	TENDER

Project Title: CARLOW & WEXFORD BRIDGES REHABILITATION CONTRACT

Drawing Title: STRUCTURE No. 5 WX-N11-003.00 GLEBE BRIDGE FENCING, TOPSOILING & CONCRETE/ MASONRY REPAIRS

Drawn:	Job No:	Drawing No:	Rev:
OMF	15.135	1700-ST05-001	T0
Scale: (A1) AS SHOWN	Date: JUNE 2016		

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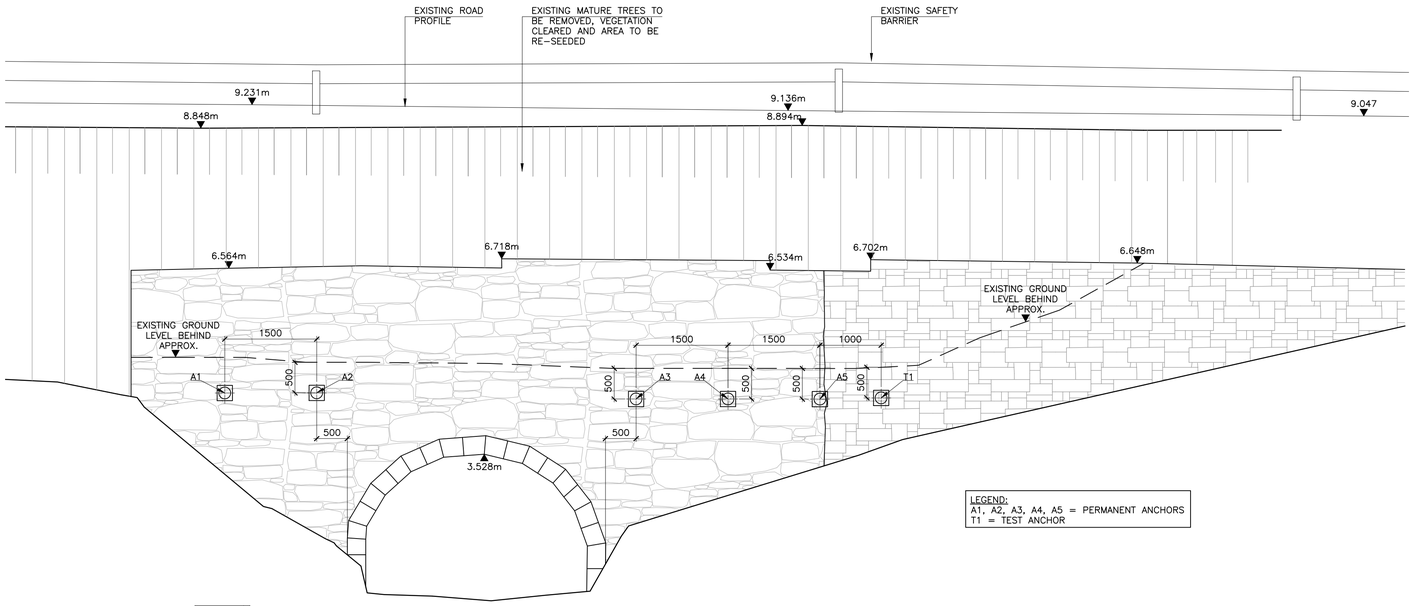

WEST ELEVATION SHOWING TYPICAL GROUND ANCHOR ARRANGEMENT

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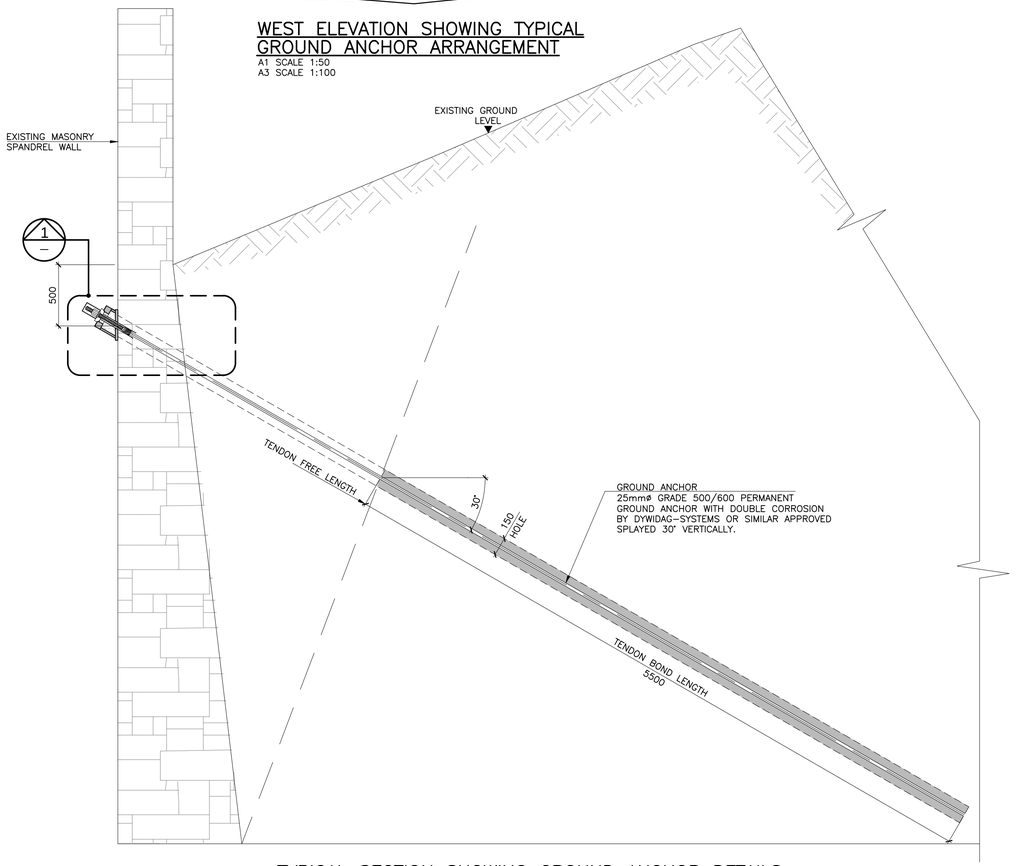

TYPICAL SECTION SHOWING GROUND ANCHOR DETAILS

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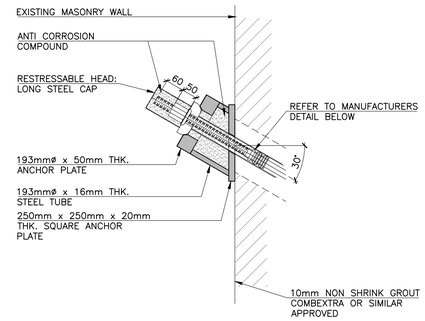

DETAIL 1

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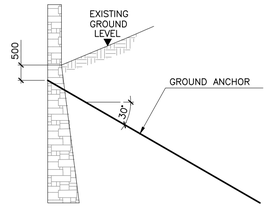


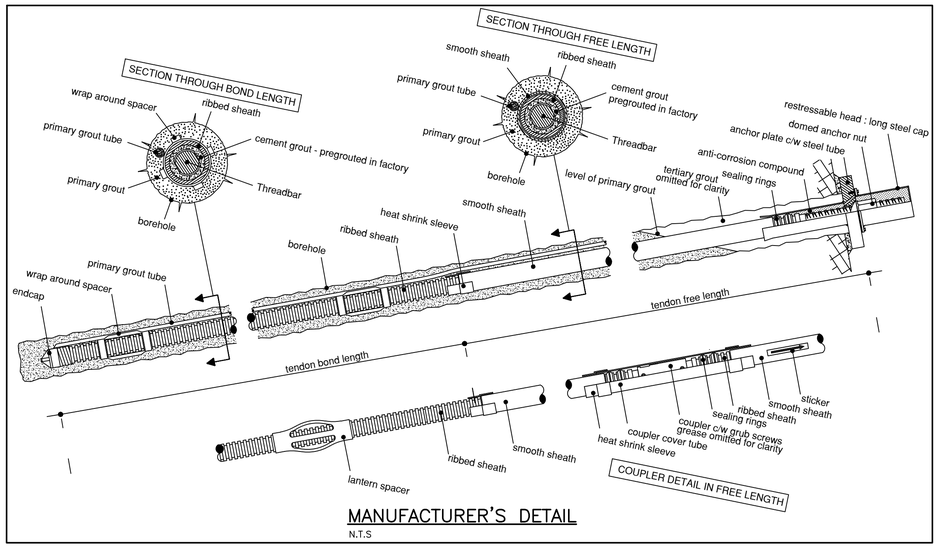
TYPICAL GROUND ANCHOR ARRANGEMENTS

A1 SCALE 1:100
A3 SCALE 1:200

RETAINED HEIGHT H(m)	ANCHOR LENGTH L(m)	ANGLE INCLINED ϕ(°)	HOLE DIAMETER ø(mm)	DIAMETER BAR øbar(mm)
3.5 – 4.0	8.0	30°	150	25

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM.
3. ALL CO-ORDINATES ARE IN METRES TO IRISH TRANSVERSE MERCATOR.
4. ANCHORS TO BE DESIGNED, INSTALLED, TESTED AND STRESSED IN ACCORDANCE WITH APPENDIX 6/10 OF THE SPECIFICATION.
5. ALL ANCHORS REQUIRE DOUBLE CORROSION PROTECTION IN ACCORDANCE WITH EN 1537.



MANUFACTURER'S DETAIL

N.T.S

No.	Revision	Date	By	Chk'd	App'd
T0	ISSUED FOR TENDER	29/07/16	OMF	PK	RMJ
	Stage		Date		App'd
	PRELIMINARY				
	APPROVAL				
	TENDER		JULY '16		RMJ
	CONSTRUCTION				

KILDARE NRO NATIONAL ROADS OFFICE
TII Transport Infrastructure Ireland
Wexford County Council — WEXFORD Co. Co.
KILDARE Co. Co.
CARLOW COUNTY COUNCIL — CARLOW Co. Co.

Roughan & O'Donovan-AECOM Alliance
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Website : www.rod.ie
www.aecom.com

Designed:	Checked:	Approved:	Status:
PK	RMJ	RMJ	TENDER

Project Title: CARLOW & WEXFORD BRIDGES REHABILITATION CONTRACT

Drawing Title: STRUCTURE No. 5 WX-N11-003.00 GLEBE BRIDGE SPANDREL WALL STABILITY WORKS

Drawn:	Job No:	Drawing No:	Rev:
OMF	15.135	1700-ST05-002	T0

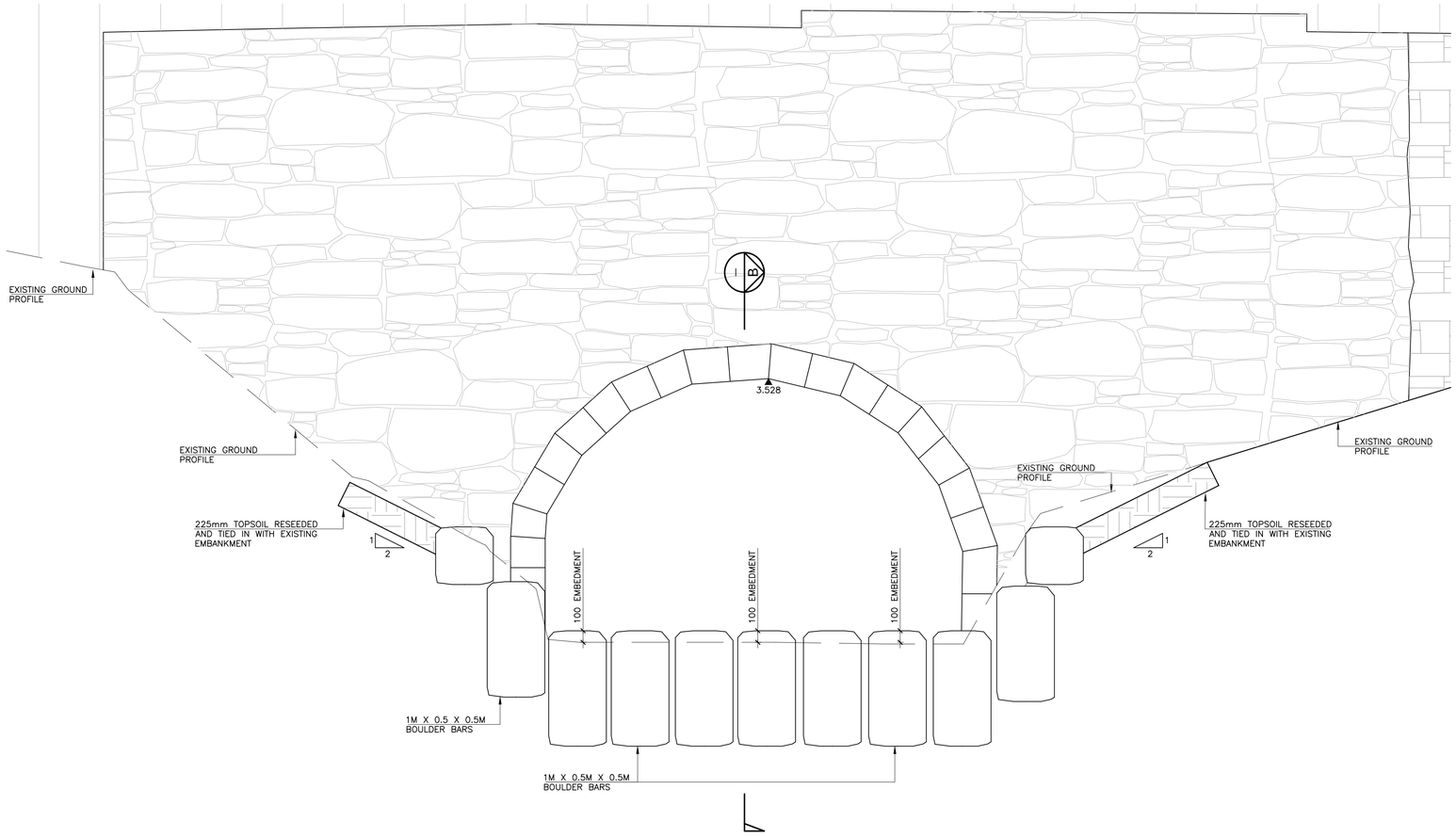
Scale: (A1) AS SHOWN
Date: JUNE 2016

Jul 29, 2016 - 2:08pm Drawing Location: J:\2015\15135\Dwg\Detailed Design\Part 2\Change Order No. 1\Structure 5 Glebe Bridge\1700-ST05-002.dwg

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM.
3. ALL CO-ORDINATES ARE IN METRES TO IRISH TRANSVERSE MERCATOR.



TYPICAL SECTION A–A SHOWING BOULDER BAR BED CHECK WEIR

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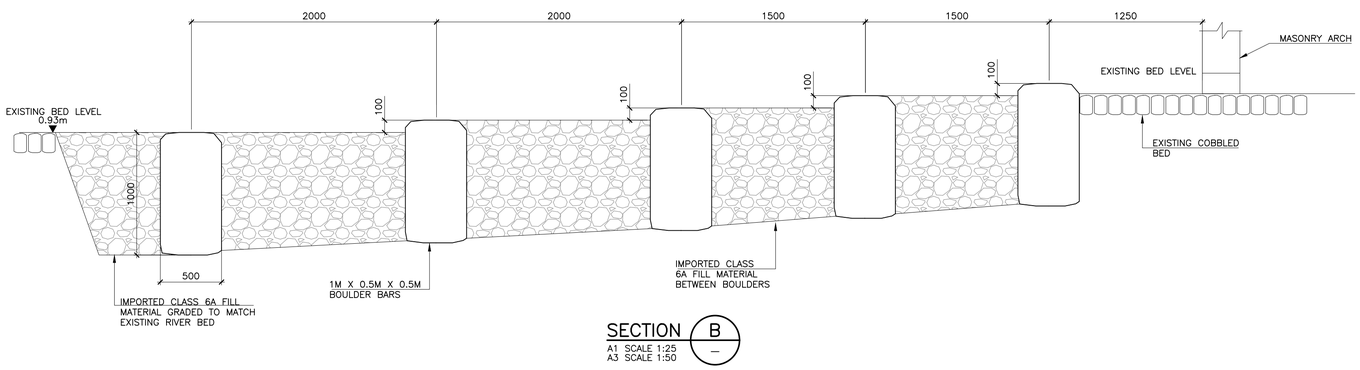
A3 SCALE 1:50



SECTION B–B

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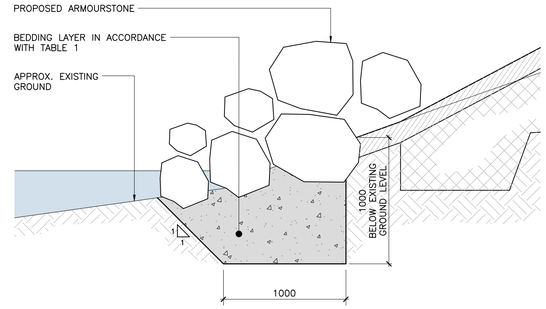

TYPICAL BEDDING DETAIL FOR ARMOUR STONE

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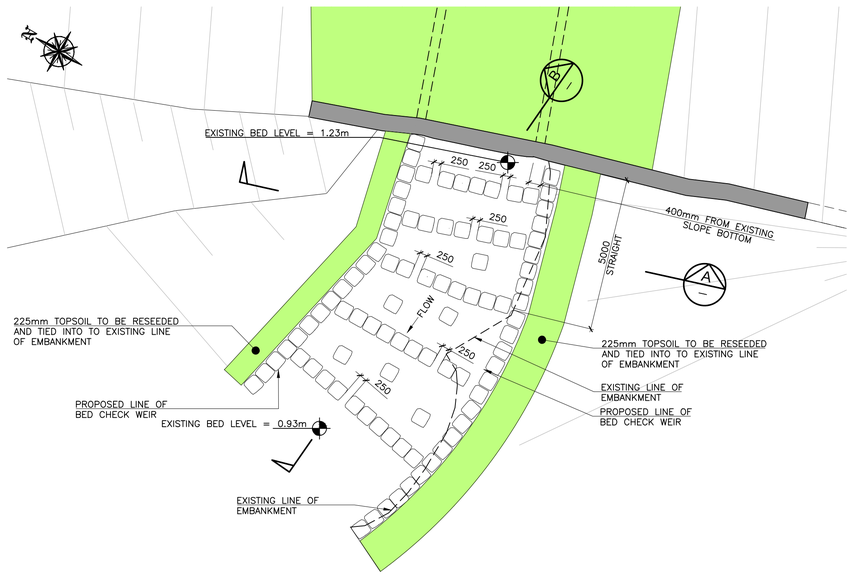

PLAN ON BED CHECK WEIR

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A3 SCALE 1:200

No.	Revision	Date	By	Chk'd	App'd
T0	ISSUED FOR TENDER	29/07/16	OMF	PK	RMJ
	Stage		Date		App'd
	PRELIMINARY				
	APPROVAL				
	TENDER		JULY '16		RMJ
	CONSTRUCTION				

WEXFORD Co. Co. KILDARE Co. Co. CARLOW Co. Co.

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Designed: PK | Checked: RMJ | Approved: RMJ | Status: TENDER

Project Title: CARLOW & WEXFORD BRIDGES REHABILITATION CONTRACT

Drawing Title: STRUCTURE No. 5 WX-N11-003.00 GLEBE BRIDGE RIVERBED & EMBANKMENT REMEDIAL WORKS

Drawn: OMF | Job No: 15.135 | Drawing No: 1700-ST05-003 | Rev: T0

Scale: (A1) AS SHOWN | Date: JUNE 2016

Jul 29, 2016 - 2:08pm Drawing Location: J:\2015\15135\Dwg\Detailed Design\Part 2\Change Order No. 1\Structure 5 Glebe Bridge\1700-ST05-003.dwg

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APPENDIX B
NPWS Site Synopses & Conservation Objectives

SITE SYNOPSIS

Site Name: Slaney River Valley SAC

Site Code: 000781

This site comprises the freshwater stretches of the River Slaney as far as the Wicklow Mountains; a number of tributaries, the larger of which include the Bann, Boro, Glasha, Clody, Derry, Derreen, Douglas and Carrigower Rivers; the estuary at Ferrycarrig; and Wexford Harbour. The site flows through the Counties of Wicklow, Wexford and Carlow. Towns along the site but not within it include Baltinglass, Hacketstown, Tinahely, Tullow, Bunclody, Camolin, Enniscorthy and Wexford. The river is up to 100 m wide in places and is tidal at the southern end from Edermine Bridge below Enniscorthy. In the upper and central regions almost as far as the confluence with the Derry River the geology consists of granite. Above Kilcarry Bridge, the Slaney has cut a gorge into the granite plain. The Derry and Bann Rivers are bounded by a narrow line of uplands which corresponds to schist outcrops. Where these tributaries cut through this belt of hard rocks they have carved deep gorges, more than two miles long at Tinahely and Shillelagh. South of Kildavin the Slaney flows through an area of Ordovician slates and grits.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1330] Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
[1410] Mediterranean salt meadows (*Juncetalia maritimi*)
[3260] Floating River Vegetation
[91A0] Old Oak Woodlands
[91E0] Alluvial Forests*

[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
[1095] Sea Lamprey (*Petromyzon marinus*)
[1096] Brook Lamprey (*Lampetra planeri*)
[1099] River Lamprey (*Lampetra fluviatilis*)
[1103] Twaite Shad (*Alosa fallax*)
[1106] Atlantic Salmon (*Salmo salar*)
[1355] Otter (*Lutra lutra*)
[1365] Common (Harbour) Seal (*Phoca vitulina*)

Floating river vegetation is found along much of the freshwater stretches within the site. Species present here include Pond Water-crowfoot (*Ranunculus peltatus*), other water-crowfoot species, Canadian Pondweed (*Elodea canadensis*), Broad-leaved Pondweed (*Potamogeton natans*), water-milfoils (*Myriophyllum* spp.), Common Club-rush (*Scirpus lacustris*), water-starworts (*Callitriche* spp.), Hemlock Water-dropwort (*Oenanthe crocata*), Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica*. Two rare aquatic plant species which are legally protected under the Flora (Protection) Order, 2015, have been recorded in this site: Short-leaved Water-starwort (*Callitriche truncata*), a very rare, small aquatic herb found nowhere else in Ireland, and Opposite-leaved Pondweed (*Groenlandia densa*).

Good examples of wet woodland are found associated with Macmine marshes, along the banks of the Slaney and its tributaries, and within reedswamps. Rusty Willow (*Salix cinerea* subsp. *oleifolia*) scrub and pockets of wet woodland dominated by Alder (*Alnus glutinosa*) have become established in places. Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland, with Meadowsweet (*Filipendula ulmaria*), Wild Angelica (*Angelica sylvestris*), Yellow Iris (*Iris pseudacorus*), horsetails (*Equisetum* spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*). These woodlands have been described as two types: one is quite eutrophic, dominated by willow and subject to a tidal influence; while the other is flushed or spring-fed, subject to waterlogging but not to flooding, and dominated by Alder and Ash.

Old oak woodlands are best represented at Tomnafinnoge, though patches are present throughout the site. At Tomnafinnoge the wood is dominated by mature, widely spaced Sessile Oak (*Quercus petraea*), which were planted around 1700, with some further planting in 1810. There is now a varied age structure with over-mature, mature and young trees. The open canopy permits light to reach the forest floor and encourages natural regeneration of Sessile Oak. As well as Sessile Oak, the wood includes occasional Beech (*Fagus sylvatica*), birch (*Betula* sp.), Rowan (*Sorbus aucuparia*) and Scots Pine (*Pinus sylvestris*).

The shrub layer is well-developed with Hazel (*Corylus avellana*) and Holly (*Ilex aquifolium*) occurring. The ground layer consists of Great Wood-rush (*Luzula sylvatica*) and Bilberry (*Vaccinium myrtillus*), with some Bracken (*Pteridium aquilinum*) and Bramble (*Rubus fruticosus* agg.). Herbaceous species in the ground layer include Primrose (*Primula vulgaris*), Wood-sorrel (*Oxalis acetosella*), Common Cow-wheat (*Melampyrum pratense*) and Bluebell (*Hyacinthoides non-scripta*). Many of the trees carry an epiphytic flora of mosses, Polypody (*Polypodium vulgare*), and lichens such as *Usnea comosa, Evernia prunastri, Ramalina* spp. and *Parmelia* spp.

Tomnafinnoge Wood is a remnant of the ancient Shillelagh oak woods, and it appears that woodland has always been present on the site. In the past, the wood was managed as a Hazel coppice with Oak standards, a common form of woodland management in England but not widely practised in Ireland. The importance of the

woodland lies in the size of the trees, their capacity to regenerate, their genetic continuity with ancient woodland and their historic interest. The nearest comparable stands are at Abbeyleix, Co. Laois and Portlaw, Co. Waterford.

Below Enniscorthy there are several areas of woodland with a mixed canopy of oak, Beech, Sycamore (*Acer pseudoplatanus*), Ash and generally a good diverse ground flora. Near the mouth of the river at Ferrycarrig is a steep south facing slope covered with oak woodland. Holly and Hazel are the main species in the shrub layer and a species-rich ground flora typical of this type of oak woodland has abundant ferns (*Dryopteris filix-mas, Polystichum setiferum* and *Phyllitis scolopendrium*) and mosses (*Thuidium tamariscinum, Mnium hornum* and *Eurynchium praelongum*). North of Bunclody, the river valley still has a number of dry woodlands though these have mostly been managed by the estates, with the introduction of Beech and occasional conifers. The steeper sides are covered in a thick scrub from which taller trees protrude.

At the southern end of the site, the Red Data Book species Yellow Archangel (*Lamiastrum galeobdolon*) occurs. Three more Red Data Book species have also been recorded from the site: Blue Fleabane (*Erigeron acer*), Basil Thyme (*Acinos arvensis*), and Small Cudweed (*Logfia minima*). Basil Thyme and Small Cudweed are protected under the Flora (Protection) Order, 2015. A nationally rare species, Summer Snowflake (*Leucojum aestivum*), is also found within the site.

Mixed woodlands occur at Carrickduff and Coolaphuca in Bunclody. Oak trees, which make up the greater part of the canopy, were originally planted and at the present time are not regenerating actively. In time, if permitted, the woodland will probably become dominated by Beech. A fair number of Yew (*Taxus baccata*) trees have also reached a large size and these, together with Holly, give to the site some of the appearance of a south-western oak wood.

The site is considered to contain a very good example of the extreme upper reaches of an estuary. Tidal reedbeds with wet woodland are present in places. The fringing reed communities support Sea Club-rush (*Scirpus maritimus*), Grey Club-rush (*S. tabernaemontani*) and abundant Common Reed (*Phragmites australis*). Other species occurring are Bulrush (*Typha latifolia*), Reed Canary-grass (*Phalaris arundinacea*) and Branched Bur-reed (*Sparganium erectum*). The reedswamp is extensive around Macmine, where the river widens and there are islands with swamp and marsh vegetation. Further south of Macmine are expanses of intertidal mudflats and sandflats and shingle shore often fringed with a narrow band of saltmarsh and brackish vegetation. Narrow shingle beaches up to 10 m wide occur in places along the river banks and are exposed at low tide. Upslope the shingle is sometimes colonised by Saltmarsh Rush (*Juncus gerardii*), Townsend's Cord-grass (*Spartina townsendii*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium),* Hemlock Water-dropwort and the non-native and invasive Himalayan Balsam (*Impatiens glandulifera*).

The salt marsh at Castlebridge is dominated by Mediterranean salt meadows. The main community is characterized by the presence of Sea Rush (*Juncus maritimus*). Red Fescue (*Festuca rubra*) and Creeping Bent-grass (*Agrostis stolonifera*) are both abundant within this vegetation type. Other species present include Autumn Hawkbit (*Leontodon autumnalis*), Sea Milkwort (*Glaux maritima*), Silverweed (*Potentilla anserina*), Long-bracted Sedge (*Carex extensa*), Parsley Water-dropwort (*Oenanthe lachenalii*), Curled Dock (*Rumex crispus*), Sea Arrowgrass (*Trigolchin maritima*), Smooth Sow-thistle (*Sonchus oleraceus*), Sea Plantain (*Plantago maritima*), Wild Celery (*Apium graveolens*), Spear-leaved Orache (*Atriplex prostrata*), White Clover (*Trifolium repens*), Sea Aster and Saltmarsh Rush. These species vary in cover values and Salt marsh Rush may occasionally be dominant. Species such as Hard-grass (*Parapholis strigosa*) and Common Saltmarsh-grass are found along some of the tracks, while Common Saltmarsh-grass is also more common around the mouths of the creeks and along some of the drainage channels.

The marsh is perched on ground that is bisected by a number of channels which extend a considerable distance inland. The site is notable for the presence of Borrer's Saltmarsh-grass (*Puccinnellia fasciculata*), which is found along the cattle tracks of the marsh. Another notable feature is the transition from saltmarsh to brackish marsh communities, which is quite extensive and diverse. The marsh is generally in good condition.

A significant area of Atlantic salt meadows also occurs at Castlebridge. This habitat is characterised by the presence of grassy upper saltmarsh vegetation communities dominated by Red Fescue and/or Creeping Bent-grass. Other species present include Saltmarsh Rush, Sea Milkwort (*Glaux maritima*), Sea Aster, Sea Arrowgrass (*Triglochin maritimum*), Sea Plantain, Common Scurvygrass (*Cochlearia officinalis*), and Curled Dock (*Rumex crispus*). Sea Rush may be present in this habitat and has cover values between 0-10%.

Wexford Harbour is an extensive, shallow estuary which dries out considerably at low tide exposing large expanses of mudflats and sandflats. Within these habitats four biological community complexes have been recorded: estuarine muds dominated by polychaetes and crustaceans community complex; sand dominated by polychaetes community complex; mixed sediment community complex; and fine sand with *Spiophanes bombyx* community complex. The harbour is largely sheltered by the Raven Point to the north and Rosslare Point in the south.

Other habitats present within the site include species-rich marsh in which sedges such as *Carex disticha, Carex riparia* and *Carex vesicaria* are common. Among the other species found in this habitat are Yellow Iris, Water Mint (*Mentha aquatica*), Purple Loosestrife (*Lythrum salicaria*) and Soft Rush (*Juncus effusus*). Extensive marshes occur to the west of Castlebridge associated with the tidal areas of the River Sow.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, including Sea Lamprey, River Lamprey and Brook Lamprey, Otter, Salmon, small numbers of Freshwater Pearl Mussel, and in the tidal stretches,

Twaite Shad. A survey of the Derreen River in 1995 estimated the population of Freshwater Pearl Mussel at about 3,000 individuals. This is a significant population, especially in the context of eastern Ireland. The Slaney is primarily a spring salmon fishery and is regarded as one of the top rivers in Ireland for early spring fishing. The upper Slaney and tributary headwaters are very important for spawning. The site supports regionally significant numbers of Common Seal. This Annex II species occurs year-round in Wexford Harbour where several sandbanks are used for breeding, moulting and resting activity. At least 27 Common Seal regularly occur within the site.

The site is of high ornithological importance also, with internationally important populations of Mute Swan (300), Light-bellied Brent Goose (200), Bar-tailed Godwit (1,843) and Black-tailed Godwit (350) occurring – all figures are average peaks for the five winters, 1995/96-99/2000. There are at least a further 18 species of wintering waterfowl which occur in numbers of national importance, i.e. Great-crested Grebe (123), Cormorant (443), Shelduck (903), Teal (800), Scaup (416), Goldeneye (151), Red-breasted Merganser (226), Oystercatcher (1,800), Golden Plover (3,000), Grey Plover (1,412), Lapwing (5,000), Knot (566), Sanderling (262), Dunlin (3,037), Curlew (1,300), Redshank (535), Black-headed Gull (6,136) and Lesser Black-backed Gull (1,036). Several of the above populations represent substantial proportions of the national totals, especially Shelduck (6.1%), Scaup (5.9%), Red-breasted Merganser (5.6%), Grey Plover (18.8%, the top site in the country) and Black-headed Gull (6.1%).

A nesting colony of Little Egret has recently become established within the site (12+ pairs in 2003) and birds are present in the area throughout the year. The sheltered estuarine habitat to the west of Wexford Bridge is the favoured location. Another very localised breeding species, Reed Warbler, is well established within the swamp vegetation along the River Slaney and on the South Slob (estimated as at least 10 pairs). The River Slaney supports typical riparian species, including Dipper and Kingfisher.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger, Irish Hare and Daubenton's Bat. Common Frog (*Rana temporaria*), another Red Data Book species, also occurs within the site.

Agriculture is the main land use. Arable crops are important. Improved grassland and silage account for much of the remainder. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. Run-off is undoubtedly occurring, as some of the fields slope steeply directly to the river bank. In addition, cattle have access to the river bank in places. Fishing is a main tourist attraction along stretches of the Slaney and its tributaries, and there are a number of Angler Associations, some with a number of boats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place. There are some gravel pits along the river below Bunclody and many of these are active. There is a

large landfill site adjacent to the river close to Hacketstown and at Killurin. Boating, bait-digging and fishing occur in parts of Wexford Harbour.

Waste water outflows, runoff from intensive agricultural enterprises, a meat factory at Clohamon, a landfill site adjacent to the river, and further industrial development upstream in Enniscorthy and in other towns could all have potential adverse impacts on the water quality unless they are carefully managed. The spread of exotic species is reducing the quality of the woodlands.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as important numbers of wintering wildfowl including some species listed on Annex I of the E.U. Birds Directive. The presence of wet and broadleaved woodlands increases the overall habitat diversity and the occurrence of a number of Red Data Book plant and animal species adds further importance to the site. Overall it is of considerable conservation significance.

SITE SYNOPSIS

SITE NAME: WEXFORD HARBOUR AND SLOBS SPA

SITE CODE: 004076

Wexford Harbour is the lowermost part of the estuary of the River Slaney, a major river that drains much of the south-east region. The site is divided between the natural estuarine habitats of Wexford Harbour, the reclaimed polders known as the North and South 'Slobs', and the tidal section of the River Slaney. The seaward boundary extends from the Rosslare peninsula in the south to the area just west of The Raven Point in the north. Shallow marine water is a principal habitat, but at low tide extensive areas of intertidal flats are exposed. These vary from rippled sands in exposed areas to sandy-muds in the more sheltered areas, especially at Hopeland and the inner estuary to the west of Wexford bridge. The flats support a rich macro-invertebrate fauna, including the bivalves Cockle (*Cerastoderma edule*), Baltic Tellin (*Macoma balthica*) and Peppery Furrow-shell (*Scrobicularia plana*), the polychaetes Lugworm (*Arenicola marina*), Catworm (*Nepthys hombergi*) and Ragworm (*Hediste diversicolor*) and the crustacean *Corophium volutator*. Beds of mussels (*Mytilus edulis*) also occur. Salt marshes fringe the intertidal flats, especially in the sheltered areas such as Hopeland and towards Castlebridge. The Slobs are two flat areas of farmland, mainly arable and pasture grassland, empoldered behind 19th century sea-walls. The lands are drained by a network of channels which flow into two central channels, in parts several hundred metres in width. Water from the channels is pumped into the sea with electric pumps. The channels often support swamp vegetation. The river section of the site is extensive, extending to Enniscorthy, a distance of almost 20 km from Wexford town. It is noticeably tidal as far as Edermine Bridge but with tidal influence right up to Enniscorthy. In places, such as the Macmine marshes, it is several hundreds metres wide and here reedswamp is well developed.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Bewick's Swan, Whooper Swan, Greenland White-fronted Goose, Light-bellied Brent Goose, Shelduck, Wigeon, Teal, Mallard, Pintail, Scaup, Goldeneye, Red-breasted Merganser, Hen Harrier, Coot, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Lesser Black-backed Gull and Little Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is of international importance for several species of waterbirds but also because it regularly supports well in excess of 20,000 waterbirds (average peak of 49,030 for the 5 winters 1996/97-2000/01). Wexford Harbour and Slobs is one of the top three sites in the country for numbers and diversity of wintering birds. The

combination of estuarine habitats, including shallow waters for grebes, diving duck and seaduck, and the farmland of the polders, which include freshwater drainage channels, provides optimum feeding and roost areas for a wide range of species. Of particular importance is that it is one of the two most important sites in the world for Greenland White-fronted Goose (9,353) (all given figures for species are average peaks for the 5 winters 1995/96-1999/00). The geese feed almost entirely within the Slobs and roost at The Raven (a separate SPA). The site also has internationally important populations of Mute Swan (543), Light-bellied Brent Goose (1,469), Bar-tailed Godwit (1,696) and Black-tailed Godwit (790).

There are at least a further 26 species of wintering waterbirds which occur in numbers of national importance, i.e. Great Crested Grebe (117), Little Grebe (82), Cormorant (495), Grey Heron (52), Whooper Swan (100), Bewick's Swan (191), Shelduck (753), Wigeon (2,752), Teal (1,538), Mallard (3,290), Pintail (66), Scaup (339), Goldeneye (182), Red-breasted Merganser (209), Coot (351), Oystercatcher (1,493), Golden Plover (5,013), Grey Plover (1,279), Lapwing (11,826), Knot (453), Sanderling (210), Dunlin (2,485), Curlew (1,771), Redshank (555), Black-headed Gull (5,977) and Lesser Black-backed Gull (1,086). Other species that use the site include Ringed Plover (69), Turnstone (41), Greenshank (12), Shoveler (24), Tufted Duck (114), Pochard (218), Common Gull (100+) and Little Egret. Several of the above populations represent substantial proportions of the national totals, especially Shelduck (5.2%), Scaup (5.3%), Red-breasted Merganser (5.7%) and Grey Plover (19.9% and the top site in the country). The Slobs is the most important and indeed one of the few sites in the country which supports a regular flock of Bewick's Swan. Numbers of wintering birds are often swelled by hard-weather movements from Britain and Europe, notably Golden Plover and Lapwing.

The site is a regular location for scarce passage waders such as Ruff, Spotted Redshank and Green Sandpiper, as well as Curlew Sandpiper in varying numbers. The rare Wood Sandpiper is seen each year, mainly in autumn.

Short-eared Owl and Hen Harrier are regular visitors to the Slobs during winter. Of particular note is the presence of a Hen Harrier communal roost site with a five year mean peak count of 5 birds (2005/06 to 2009/10).

The site is important for Little Tern as it has can hold a nationally important breeding colony (12 pairs in 1995 and 30 pairs in 2000). The Slobs support a nesting colony of Tree Sparrow, a very localised species in Ireland that is listed in the Irish Red Data Book. Another very localised breeding species, Reed Warbler, is well established within the swamp vegetation along the River Slaney and on the South Slob (estimated as at least 10 pairs).

A range of duck species breed, including Teal, Tufted Duck and, probably in most years, Shoveler.

Wexford Harbour and Slobs SPA is one of the most important ornithological sites in the country supporting internationally important populations of Greenland White-fronted Goose, Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit. In addition, it has 26 species of wintering waterbirds with populations of

national importance and nationally important numbers of breeding Little Tern. Also of significance is that several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Little Egret, Whooper Swan, Bewick's Swan, Greenland White-fronted Goose, Hen Harrier, Golden Plover, Bar-tailed Godwit, Ruff, Wood Sandpiper, Little Tern and Short-eared Owl. The site is an important centre for research, education and tourism. Wexford Wildfowl Reserve, located within Wexford Harbour and Slobs SPA, is a Ramsar Convention site, a Biogenetic Reserve and a Statutory Nature Reserve. Parts of the Wexford Harbour and Slobs SPA are also designated as Wildfowl Sanctuaries.

8.7.2014

National Parks and Wildlife Service

Conservation Objectives Series

Slaney River Valley SAC 000781

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these 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.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000781	Slaney River Valley SAC
1029	Freshwater Pearl Mussel *Margaritifera margaritifera*
1095	Sea Lamprey *Petromyzon marinus*
1096	Brook Lamprey *Lampetra planeri*
1099	River Lamprey *Lampetra fluviatilis*
1103	Twaite Shad *Alosa fallax*
1106	Atlantic Salmon *Salmo salar* (only in fresh water)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1355	Otter *Lutra lutra*
1365	Harbour Seal *Phoca vitulina*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
91E0	* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Please note that this SAC is adjacent to/overlaps with Raven Point Nature Reserve SAC 000710; The Raven SPA 004019; and Wexford Harbour and Slobs SPA 004076. See map 2.

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title: Comparison of field- and GIS-based assessments of barriers to Atlantic salmon migration: a case study in the Nore Catchment, Republic of Ireland

Year: in press

Author: Gargan, P.G.; Roche, W.K.; Keane, S.; King, J.J.; Cullagh, A.; Mills, P.; O'Keeffe, J.

Series: Journal of Applied Ichthyology

Title: Slaney River Valley SAC (000781). Conservation objectives supporting document - marine habitats and species [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: NPWS Rare and Threatened Species Database

Year: 2011

Author: NPWS

Series: Unpublished NPWS Dataset

Title: Slaney River Valley SAC (000781). Conservation objectives supporting document - woodland habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: Subtidal Benthic Investigations in Slaney River Valley cSAC (000781) and Wexford Harbour and Slobs SPA (004076) Co. Wexford

Year: 2010

Author: Aquafact

Series: Unpublished Report to NPWS & MI

Title: Otter tracking study of Roaringwater Bay

Year: 2010

Author: De Jongh, A.; O'Neill, L.

Series: Unpublished Draft Report to NPWS

Title: A provisional inventory of ancient and long-established woodland in Ireland

Year: 2010

Author: Perrin, P.M.; Daly, O.H.

Series: Irish Wildlife Manuals No. 46

Title: Report of the standing scientific committee to the DCENR. The status of Irish salmon stocks in 2010 and precautionary catch advice for 2011

Year: 2010

Author: SSC

Series: Unpublished Report to DCENR

Title: A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of Wexford Harbour

Year: 2009

Author: ASU

Series: Unpublished Report to NPWS

Title: The European Communities Environmental Objectives (Surface Water) Regulations 2009. [S.I. 272 of 2009]
Year: 2009
Author: Government of Ireland
Series: Irish Statute Book

Title: Aspects of anadromous Allis shad (*Alosa alosa* Linnaeus) and Twaite shad (*Alosa fallax* Lacépède) biology in four Irish Special Areas of Conservation (SACs): status, spawning indications and implications for consŜ⁄Øŀŭ⁄2ƴŘŜă⁄ƎƴŀŬ⁄2ƴ
Year: 2008
Author: King, J.J.; Roche, W.K.
Series: Hydrobiologia 602, 145–154

Title: Water-starworts, *Callitriche*, of Europe
Year: 2008
Author: Lansdown, R.V.
Series: BSBI Handbook, No. 11, London

Title: Poor water quality constrains the distribution and movements of Twaite shad *Alosa fallax fallax* (Lacepede, 1803) in the watershed of river Scheldt
Year: 2008
Author: Maas, J.; Stevens, M. ; Breine, J.
Series: Hydrobiologia 602, 129 - 143

Title: National Survey of Native Woodlands 2003-2008
Year: 2008
Author: Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A.
Series: Unpublished Report to NPWS

Title: Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents, Article 17 forms and supporting maps
Year: 2007
Author: NPWS
Series: Unpublished Report to NPWS

Title: A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments
Year: 2007
Author: O'Connor, W.
Series: Irish Wildlife Manuals No. 26

Title: Otter Survey of Ireland 2004/2005
Year: 2006
Author: Bailey, M.; Rochford, J.
Series: Irish Wildlife Manuals No. 23

Title: Otters - ecology, behaviour and conservation
Year: 2006
Author: Kruuk, H.
Series: Oxford University Press

Title: Harbour seal population assessment in the Republic of Ireland: August 2003
Year: 2004
Author: Cronin, M.; Duck, C.; Ó Cadhla, O.; Nairn, R.; Strong, D.; O'Keeffe, C.
Series: Irish Wildlife Manuals No. 11

Title: The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs
Year: 2004
Author: King, J.J.; Linnane, S.M.
Series: Irish Wildlife Manuals No. 14

Title: Monitoring the river, sea and brook lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*
Year: 2003
Author: Harvey, J.; Cowx, I.
Series: Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough

Title: Ecology of Watercourses Characterised by *Ranunculion fluitantis* and *Callitricho-Batrachion* Vegetation
Year: 2003
Author: Hatton-Ellis, T.W.; Grieve, N.
Series: Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough

Title: Ecology of the Allis and Twaite shad
Year: 2003
Author: Maitland, P.S.; Hatton-Ellis, T.W.
Series: Conserving Natura 2000 Rivers Ecology Series No. 3. English Nature, Peterborough

Title: Pondweeds of Great Britain and Ireland
Year: 2003
Author: Preston, C.D.
Series: BSBI Handbook, No. 8, London

Title: Reversing the habitat fragmentation of British woodlands
Year: 2002
Author: Peterken, G.
Series: WWF-UK, London

Title: Aquatic Plants in Britain and Ireland
Year: 2001
Author: Preston, C.D.
Series: Harley Books, Colchester

Title: Diet of Otters *Lutra lutra* on Inishmore, Aran Islands, west coast of Ireland
Year: 1999
Author: Kingston, S.; O'Connell, M.; Fairley, J.S.
Series: Biol & Environ Proc R Ir Acad B 99B:173–182

Title: The spatial organization of otters (*Lutra lutra*) in Shetland
Year: 1991
Author: Kruuk, H.; Moorhouse, A.
Series: J. Zool, 224: 41-57

Title:	CORINE Biotopes Database - Ireland
Year:	1989
Author:	NPWS
Series:	Unpublished NPWS Dataset
Title:	The vegetation of Irish rivers
Year:	1987
Author:	Heuff, H.
Series:	Unpublished Report
Title:	Otter survey of Ireland
Year:	1982
Author:	Chapman, P.J.; Chapman, L.L.
Series:	Unpublished Report to Vincent Wildlife Trust
Title:	The distribution of grey and common seals on the coasts of Ireland
Year:	1966
Author:	Lockley, R.M.
Series:	Irish Naturalists' Journal 15: 136-143

Spatial data sources

Year:	2010
Title:	EPA WFD transitional waterbody data
GIS operations:	Clipped to SAC boundary
Used for:	1130 (map 3)
Year:	Interpolated 2011
Title:	2008 intertidal survey data; 2010 subtidal survey data
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used for:	Marine community types, 1140 (maps 4 and 5)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used for:	Marine community types base data (map 5)
Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	91A0, 91E0 (map 6)
Year:	Derived 2011
Title:	Internal NPWS files
GIS operations:	Dataset created from spatial references contained in files
Used for:	3260 (map 6)
Year:	2011
Title:	NPWS rare and threatened species database
GIS operations:	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used for:	1365 (map 7)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High Water Mark (HWM) polyline feature class converted into polygon feature class; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1365 (map 7)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the terrestrial side of the river banks data; creation of 20m buffer applied to canal centreline data. These datasets are combined with the derived EPA WDF Waterbodies data. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)

Year:	2010
Title:	EPA WFD Waterbodies data
GIS operations:	Creation of a 20m buffer applied to river and stream centreline data; creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets are combined with the derived OSi data. Overlapping regions investigated and resloved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the Slaney River Valley SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species

1095 Sea Lamprey *Petromyzon marinus*

To restore the favourable conservation condition of Sea lamprey in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. In this site, some barrier modification is required (e.g. Clohamon weir) to permit sea lamprey passage (Gargan et al., in press)
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Attribute and target based on Harvey and Cowx (2003)
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003)
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds. Improved dispersal of spawning beds into areas upstream of barriers	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Target based on studies by Central Fisheries Board (CFB)/IFI; Ecofact for NPWS (e.g. King and Linnane, 2004; O'Connor, 2007)

1096 Brook Lamprey *Lampetra planeri*

To restore the favourable conservation condition of Brook lamprey in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all water courses down to first order streams	Artificial barriers can block lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels (Gargan et al., in press)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field, hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Target based on studies by Central Fisheries Board (CFB)/IFI; Ecofact for NPWS (e.g. King and Linnane, 2004; O'Connor, 2007)

1099 River Lamprey *Lampetra fluviatilis*

To restore the favourable conservation condition of River lamprey in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	Artificial barriers can block lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels (Gargan et al., in press)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field, hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Target based on studies by Central Fisheries Board (CFB)/IFI; Ecofact for NPWS (e.g. King and Linnane, 2004; O'Connor, 2007)

1103 Twaite Shad *Alosa fallax*

To restore the favourable conservation condition of Twaite shad in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels (Gargan et al., in press)
Population structure- age classes	Number of age classes	More than one age class present	Regular breeding has not been confirmed in the River Slaney in recent years (King and Roche, 2008)
Extent and distribution of spawning habitat	m^2 and occurrence	No decline in extent and distribution of spawning habitats	
Water quality- oxygen levels	Milligrammes per litre	No lower than 5mg/l	Attribute and target based on Maas, Stevens and Briene (2008)
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	

1106 Atlantic Salmon *Salmo salar* (only in fresh water)

To restore the favourable conservation condition of Salmon in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers can block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	A conservation limit is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2010). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The fish counter at Clohamon is used to assess the run of salmon on the Slaney. The Slaney is currently (2011) below its CL for both 1SW salmon (meeting 54%) & MSW salmon (meeting 34%)
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, hydroelectric schemes, predation and sea lice (*Lepeophtheirus salmonis*)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated as 1,905ha using OSi data and the defined Transitional Water Body area under the Water Framework Directive. See marine supporting document for further information
Community distribution	Hectares	The following community types should be maintained in, or restored to, a natural condition: Mixed sediment community complex; Estuarine muds dominated by polychaetes and crustaceans community complex; and Sand dominated by polychaetes community complex. See map 5	The likely area of sediment communities was derived from a combination of intertidal and subtidal surveys undertaken in 2008 and 2010 (ASU, 2009; Aquafact, 2010). See marine supporting document for further information

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 4	Habitat area was estimated as 1,027ha using OSi data. See marine supporting document for further information
Community distribution	Hectares	The following community types should be maintained in a natural condition: Estuarine muds dominated by polychaetes and crustaceans community complex; and Sand dominated by polychaetes community complex. See map 5	The likely area of sediment communities was derived from a intertidal surveys undertaken in 2008 (ASU, 2009). See marine supporting document for further information

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in south-east estimated at 73% (Bailey and Rochford 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 64.7ha above high water mark (HWM); 453.4ha along river banks/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 534.7ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 264.1km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 0.4ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh & O'Neill, 2010). It is important that such commuting routes are not obstructed

1365 Harbour Seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use. See map 7	See marine supporting document for further details
Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition. See map 7	Attribute and target based on background knowledge of Irish breeding populations and review of data from unpublished National Parks & Wildlife Service records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition. See map 7	Attribute and target based on background knowledge of Irish populations, review of data from Lockley (1966), Cronin et al. (2004) and unpublished National Parks & Wildlife Service records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition. See map 7	Attribute and target based on background knowledge of Irish populations and unpublished National Parks & Wildlife Service records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site. See map 7	See marine supporting document for further details

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

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 6 for mapped known extent	The full distribution of this habitat and its sub-types in this site is currently unknown. The basis of the selection of the SAC for the habitat is the presence of an excellent example of the vegetation asssemblage associated with tidal reaches of large rivers between Enniscorthy and Polladerg townland (see map 6). This sub-type is characterised by the presence of the rare and protected species short-leaved water-starwort (*Callitriche truncata*) and Opposite-leaved pondweed (*Groenlandia densa*). Other sub-types of the habitat were recorded in two tributaries of the Slaney: *Scapanietum undulatae* and *Pellietum epiphyllae scapanietosum* (Derreen River) and *Callitricho-Batrachionthe* (Derreen and Derry Rivers) (Heuff, 1987). Other examples of these or other sub-types may be present within the SAC
Habitat area	Kilometres	Area stable at 12.6km or increasing, subject to natural processes. See map 6	The full extent of this habitat in this site is currently unknown. The target of 12.6km applies to the tidal sub-type only
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	Due to regular disturbance (through variations in flow), river macrophytes rarely reach a climax condition but frequently occur as transient communities. A natural (relatively unmodified) flow regime is required for both plant communities and channel geomorphology to be in favourable condition, exhibiting typical dynamics for the river type (Hatton-Ellis and Grieve, 2003). For most of the sub-types of this habitat, high flows are required to maintain the substratum (see below) necessary for the characteristic species. Flow variation is particularly important, with high and flood flows being critical to the hydromorphology
Hydrological regime: tidal influcence	Daily water level fluctuations - metres	Maintain natural tidal regime	The disturbance associated with the tidal regime is the primary driver of the tidal sub-type and rare associated species (see Lansdown, 2008; Preston, 2003; Preston and Croft, 2001)

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

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Substratum composition: particle size range	Millimetres	For the tidal sub-type, the substratum of the channel must be dominated by particles of sand to gravel, with silt at the river margins	Target applies to tidal sub-type only. The size and distribution of substratum particles is largely determined by the river flow and tidal regime. Short-leaved water-starwort (*Callitriche truncata*) has been recorded from gravel-dominated substratum in the centre of the channel, as well as muds in marginal inlets and at the rivers' edge (J. Ryan, pers. comm., NPWS Rare and Threatened Species Database, 2011). Opposite-leaved pondweed (*Groenlandia densa*) is typically found on silts, sometimes sands, while needle spike-rush (*Eleocharis acicularis*) requires the marginal fine muds
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column must be sufficiently low to prevent changes in species composition or habitat condition	The Environmental Protection Agency (EPA) do not monitor the tidal stretch of the Slaney. However, the data from upstream of Enniscorthy suggest the water quality for the tidal stretch is at good status (2007-2009). It is likely that the rare species associated with the tidal sub-type are tolerant of some nutrient enrichment, but may be sensitive to severe enrichment (Preston, 2003). Consequently, water quality should reach Water Framework Directive good status, in terms of nutrient standards, and macroinvertebrate and phytobenthos quality elements (see S.I. 272 of 2009)

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

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type reach favourable status	The sub-types of this habitat are poorly understood and their typical species have not yet been defined. Additional typical species and appropriate targets may emerge. The typical species of the tidal sub-type in the Slaney include short-leaved water-starwort (*Callitriche truncata*), opposite-leaved pondweed (*Groenlandia densa*), spiked water-milfoil (*Myriophyllum spicatum*), other pondweeds (*Potamogeton* spp.), as well as pioneer vegetation of bare mud, e.g. needle spike-rush (*Eleocharis acicularis*) (NPWS Rare and Threatened Species Database, 2011; NPWS, 1989; J. Ryan, pers. comm.). The tidal stretch also supports important reed beds (including common reed (*Phragmites australis*), greater pond-sedge (*Carex riparia*), reed canary-grass (*Phalaris arundinacea*) and common club-rush (*Schoenoplectus lacustris*)), marginal swamp vegetation and freshwater marsh. The invasive macrophyte Nuttall's waterweed (*Elodea nuttallii*) is also known to occur in the tidal stretch of the Slaney (R. Goodwillie, pers. comm.). The typical species may include higher plants, bryophytes, macroalgae and microalgae
Floodplain connectivity: area	Hectares	The area of active floodplain at and upstream of the habitat must be maintained	River connectivity with the floodplain must be maintained. The site of the tidal sub-type in the Slaney River is within an area of floodplain. Floodplain connectivity is particularly important in terms of sediment sorting and nutrient deposition

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of old sessile oakwoods with *Ilex* and *Blechnum* in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 146.17ha for sub-sites surveyed. See map 6	Minimum area, based on 10 sites surveyed by Perrin et al. (2008) - site codes 1, 8, 26, 158, 172, 180, 210, 310, 749 and 988. NB further unsurveyed areas maybe present within the SAC
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring ‘deep’ woodland conditions (Peterken, 2002). Topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak regenerates poorly. In suitable sites ash can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem.
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin and Daly (2010) list sites 1, 26, 158, 172, 180, 310, 749 as potential ancient/long-established woodlands

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of old sessile oakwoods with *Ilex* and *Blechnum* in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (*Fagus sylvatica*), rhododendron (*Rhododendron ponticum*), cherry laurel (*Prunus laurocerasus*)

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

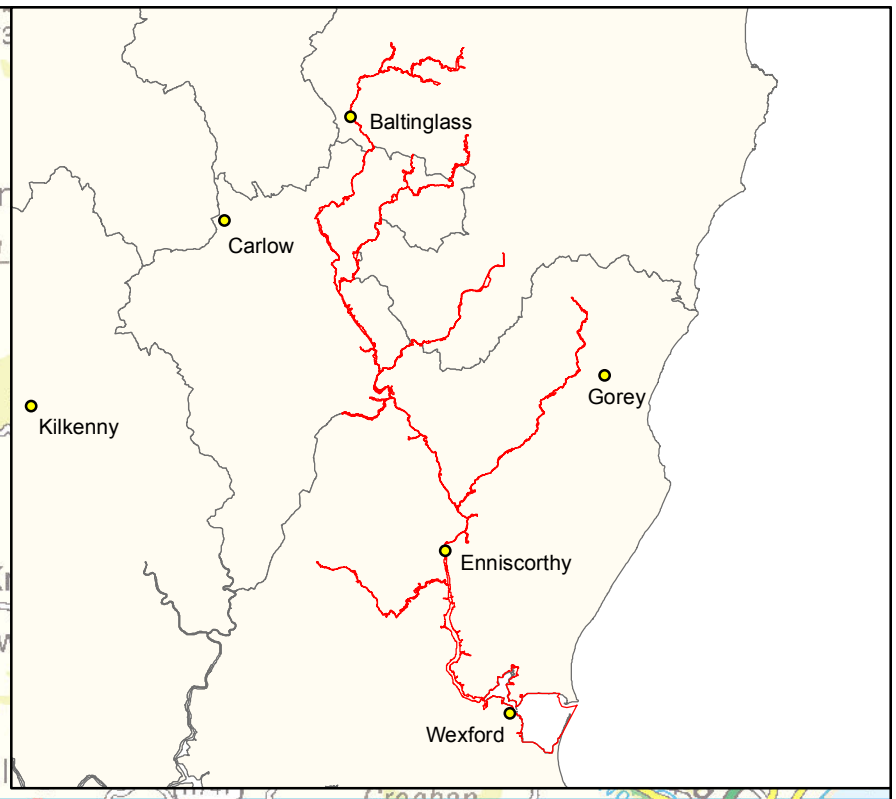
To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*) in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 18.7ha for sites surveyed. See map 6	Minimum area, based on 7 sites surveyed by Perrin et al. (2008) - site codes 1, 157, 208, 209, 211, 875, 988. NB further unsurveyed areas maybe present within the SAC
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring ‘deep’ woodland conditions (Peterken, 2002). Topographical and land-ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Alder and oak regenerate poorly. Ash often regenerates in large numbers although few seedlings reach pole size
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river floodplains
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

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

To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*) in the Slaney River Valley SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin & Daly (2010) list site 1as containing potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: sycamore (*Acer pseudoplatanus*) and Himalayan balsam (*Impatiens glandulifera*)



MAP 1:
SLANEY RIVER VALLEY
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

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Department of Arts, Heritage and the Gaeltacht

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

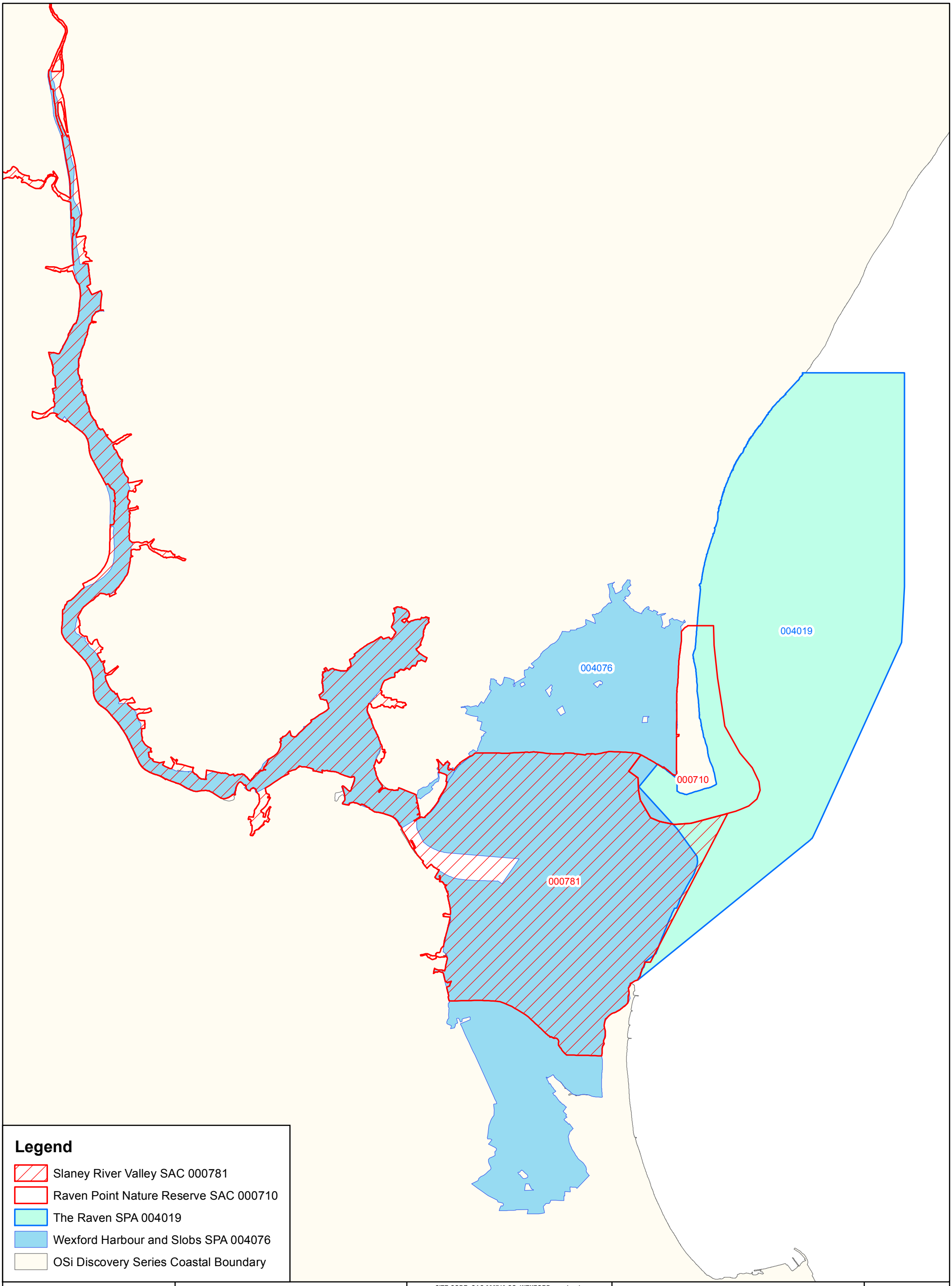
0 2 4 6 8 10 km

N

Map Version 1
Date: Sept 2011

Legend

SAC 000781



Legend

- Slaney River Valley SAC 000781
- Raven Point Nature Reserve SAC 000710
- The Raven SPA 004019
- Wexford Harbour and Slobs SPA 004076
- OSi Discovery Series Coastal Boundary

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Department of Arts, Heritage and the Gaeltacht

MAP 2:
SLANEY RIVER VALLEY SAC
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATIONS

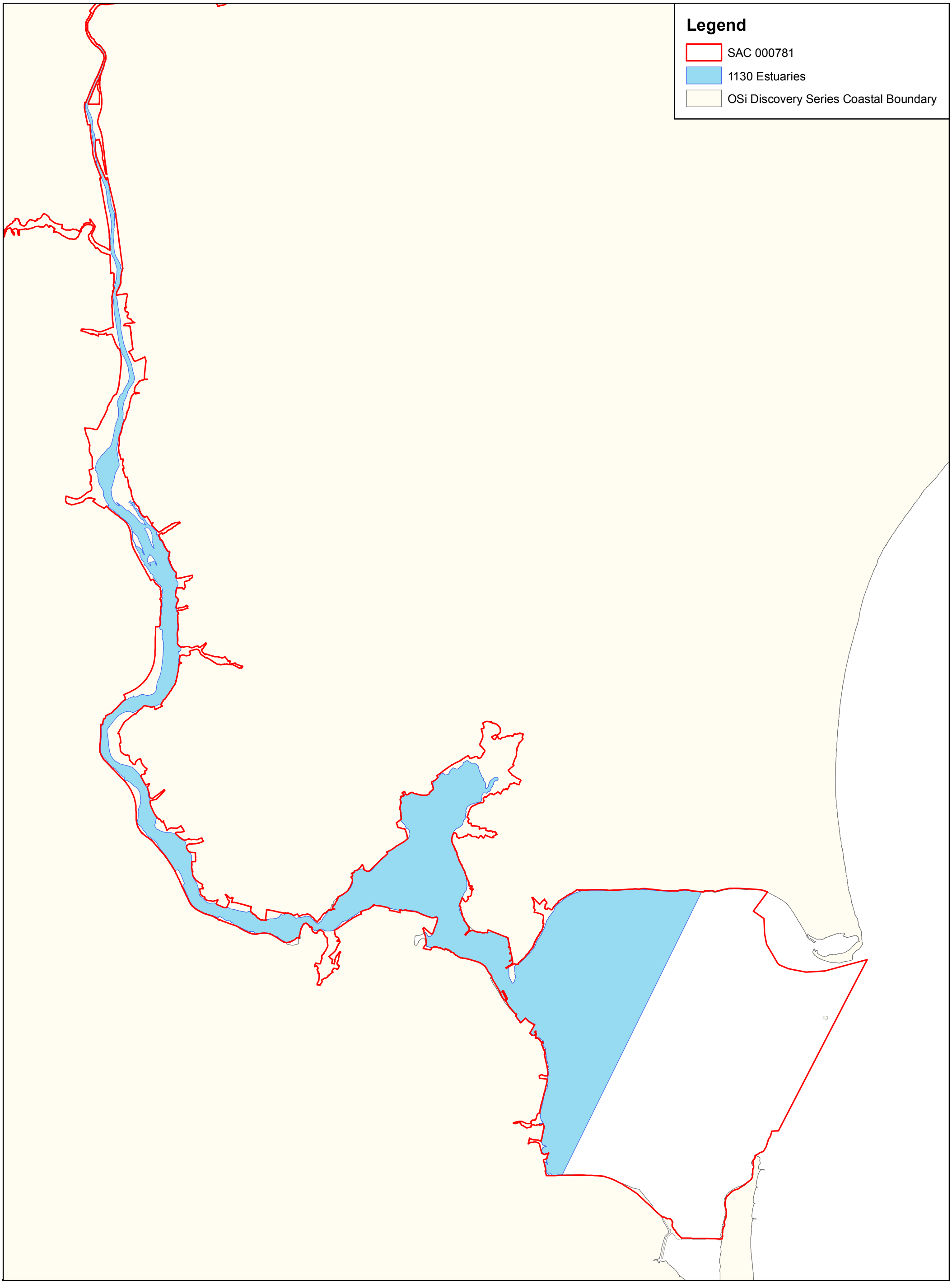
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000710 CO. WEXFORD; version 1
SAC 000781 CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07
SPA 004019 CO. WEXFORD; version 1.02
SPA 004076 CO. WEXFORD; version 2.04

0 1 2 3 km

N

Map Version 1
Date: Sept 2011



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MAP 3:
SLANEY RIVER VALLEY CONSERVATION OBJECTIVES ESTUARIES

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 1 2 3 km

N

Map Version 1
Date: Sept 2011

Legend

- SAC 000781
- 1140 Mudflats and sandflats not covered by sea water at low tide
- OSi Discovery Series Coastal Boundary

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MAP 4:
SLANEY RIVER VALLEY CONSERVATION OBJECTIVES TIDAL MUDFLATS AND SANDFLATS

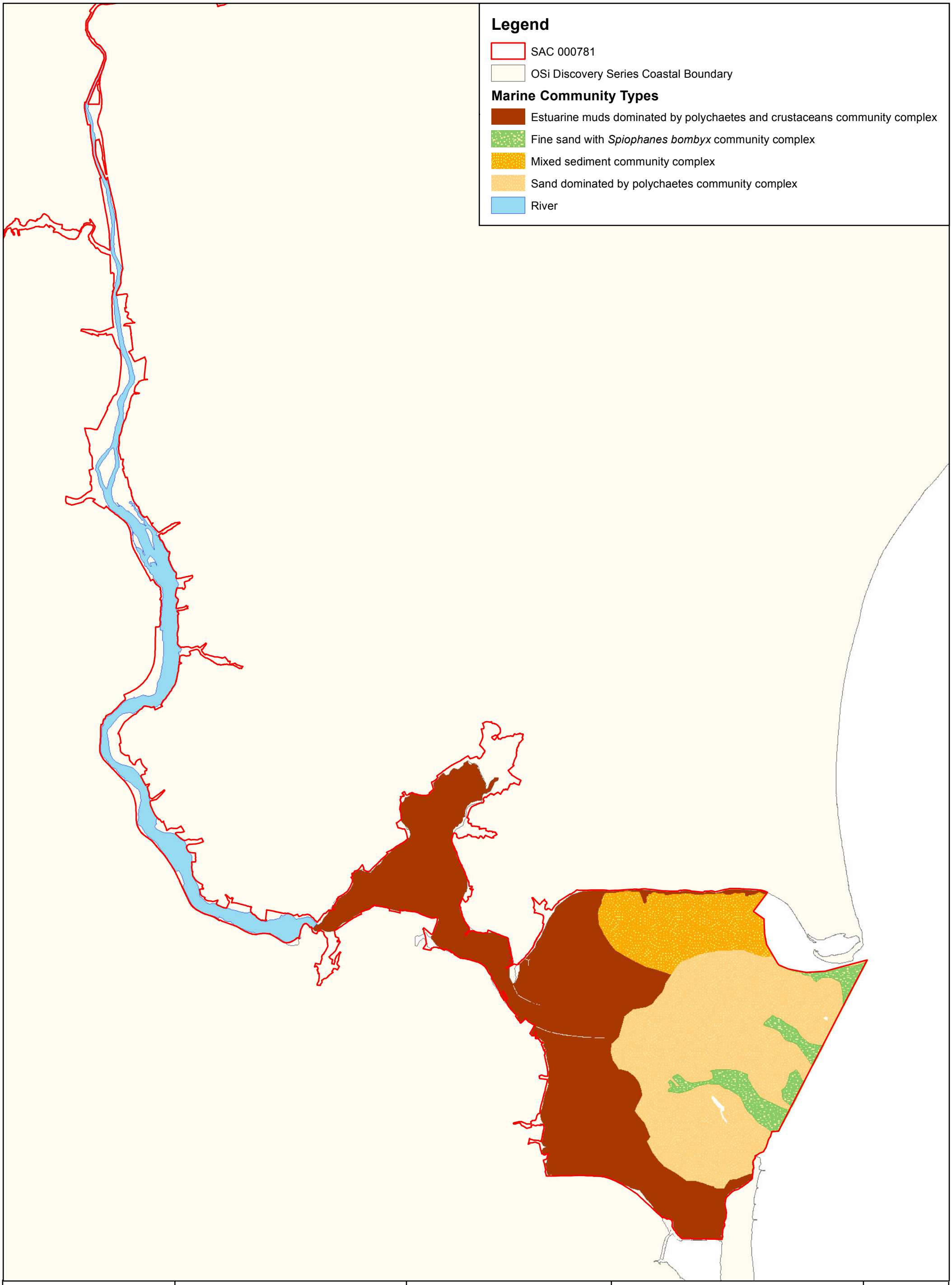
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2011



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MAP 5: SLANEY RIVER VALLEY CONSERVATION OBJECTIVES MARINE COMMUNITY TYPES

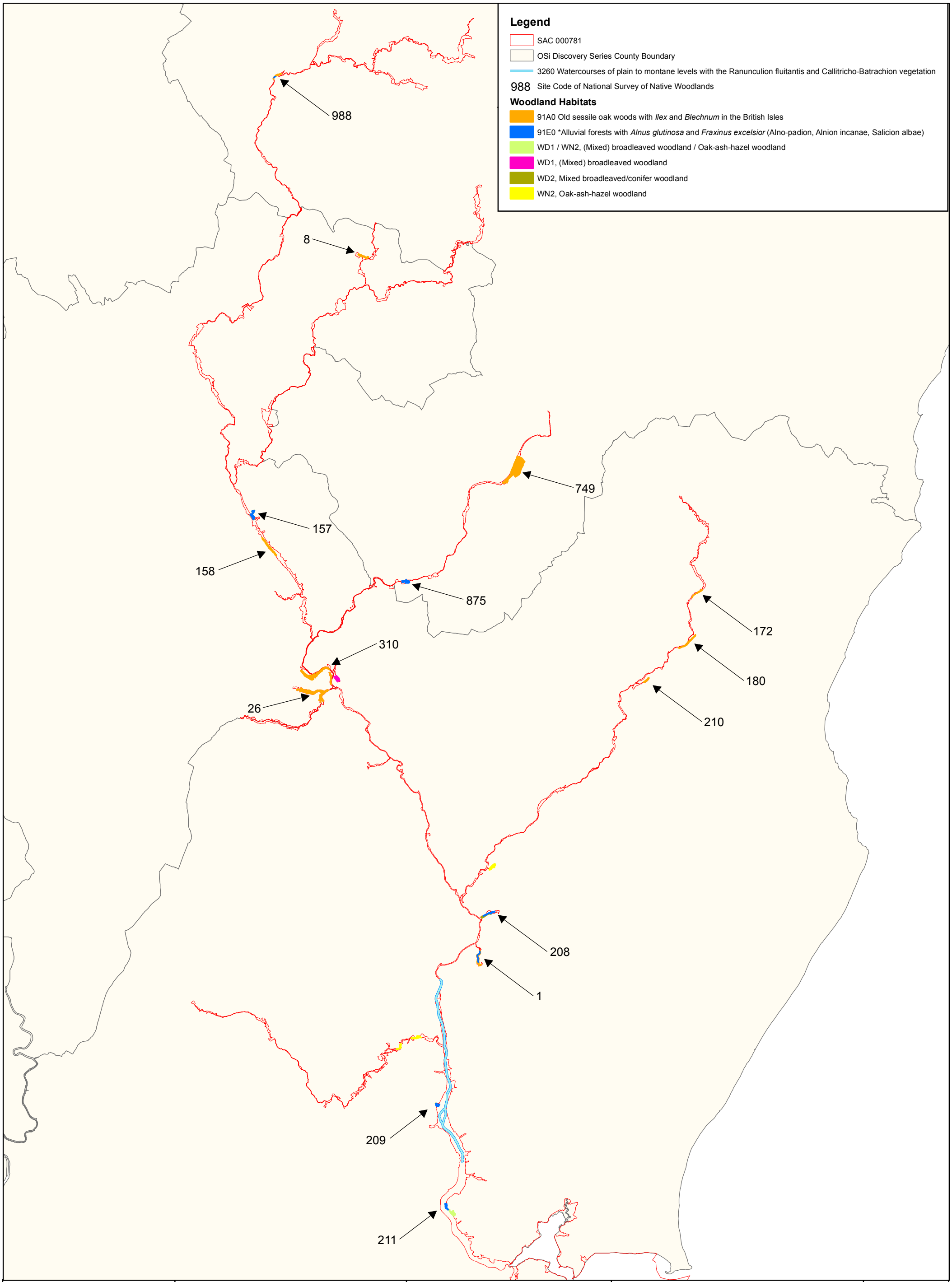
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 1 2 3 km

N

Map Version 1
Date: Sept 2011



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MAP 6:
SLANEY RIVER VALLEY
CONSERVATION OBJECTIVES
OLD OAK WOODLANDS,
ALLUVIAL FORESTS &
FLOATING RIVER VEGETATION

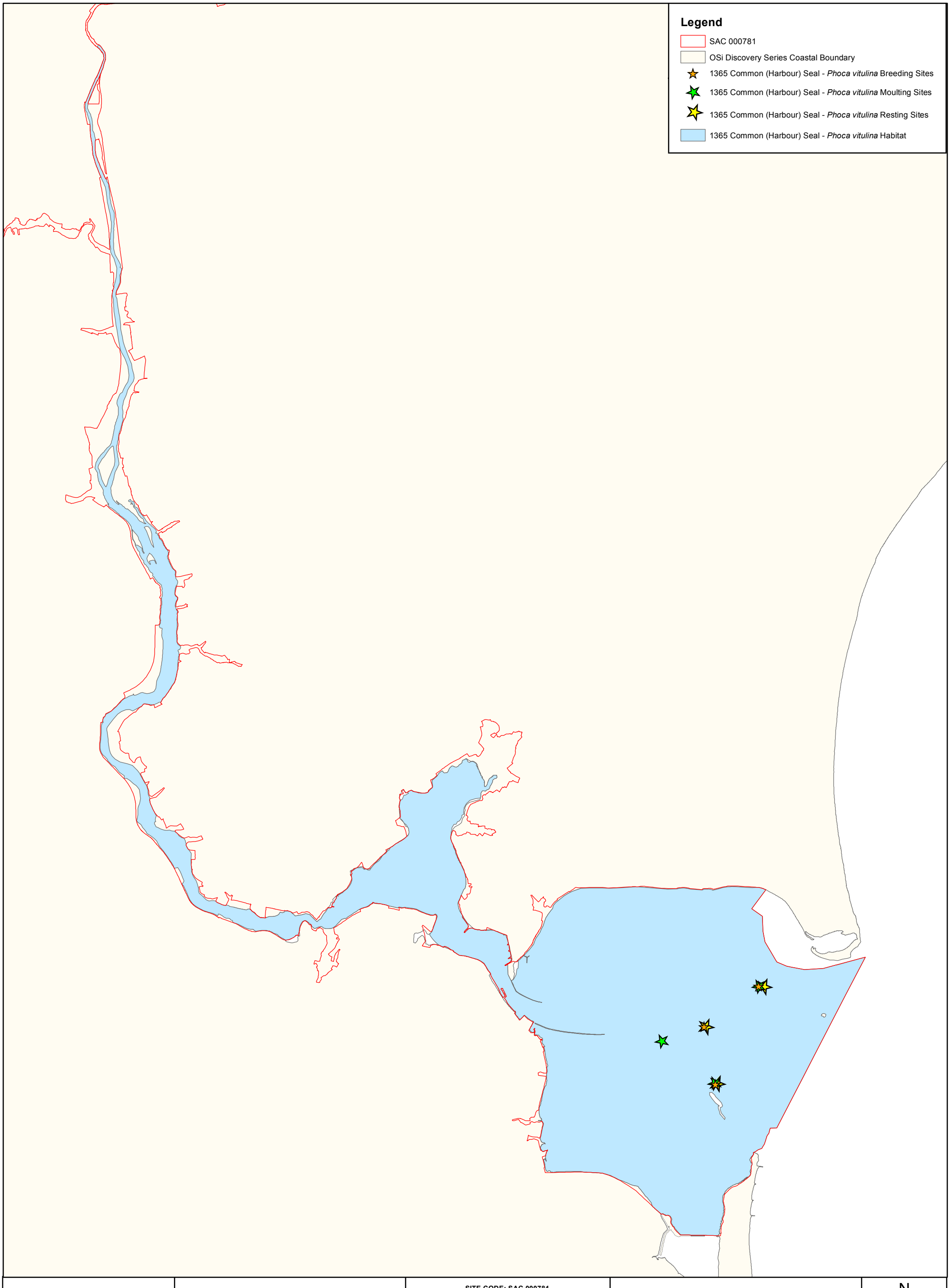
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 2 4 6 8 10 km

N

Map Version 1
Date: Sept 2011



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MAP 7:
SLANEY RIVER VALLEY CONSERVATION OBJECTIVES COMMON HARBOUR SEAL

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 000781
CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 1 2 3 km

N

Map Version 1
Date: Sept 2011

National Parks and Wildlife Service

Conservation Objectives Series

Wexford Harbour and Slobs SPA 004076

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

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ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these 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.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004076 Wexford Harbour and Slobs SPA

A004	Little Grebe *Tachybaptus ruficollis*	wintering
A005	Great Crested Grebe *Podiceps cristatus*	wintering
A017	Cormorant *Phalacrocorax carbo*	wintering
A028	Grey Heron *Ardea cinerea*	wintering
A037	Bewick's Swan *Cygnus columbianus*	wintering
A038	Whooper Swan *Cygnus cygnus*	wintering
A046	Light-bellied Brent Goose *Branta bernicla hrota*	wintering
A048	Shelduck *Tadorna tadorna*	wintering
A050	Wigeon *Anas penelope*	wintering
A052	Teal *Anas crecca*	wintering
A053	Mallard *Anas platyrhynchos*	wintering
A054	Pintail *Anas acuta*	wintering
A062	Scaup *Aythya marila*	wintering
A067	Goldeneye *Bucephala clangula*	wintering
A069	Red-breasted Merganser *Mergus serrator*	wintering
A082	Hen Harrier *Circus cyaneus*	post-breeding/roost
A125	Coot *Fulica atra*	wintering
A130	Oystercatcher *Haematopus ostralegus*	wintering
A140	Golden Plover *Pluvialis apricaria*	wintering
A141	Grey Plover *Pluvialis squatarola*	wintering
A142	Lapwing *Vanellus vanellus*	wintering
A143	Knot *Calidris canutus*	wintering
A144	Sanderling *Calidris alba*	wintering
A149	Dunlin *Calidris alpina*	wintering
A156	Black-tailed Godwit *Limosa limosa*	wintering
A157	Bar-tailed Godwit *Limosa lapponica*	wintering
A160	Curlew *Numenius arquata*	wintering
A162	Redshank *Tringa totanus*	wintering
A179	Black-headed Gull *Chroicocephalus ridibundus*	wintering
A183	Lesser Black-backed Gull *Larus fuscus*	wintering
A195	Little Tern *Sterna albifrons*	breeding
A395	Greenland White-fronted goose *Anser albifrons flavirostris*	wintering
A999	Wetlands	

Please note that this SPA is adjacent to The Raven SPA 004019. These SPAs partially overlap with Raven Point Nature Reserve SAC 000710 and Slaney River Valley SAC 000781. See map 2. The conservation objectives for this site should be used in conjunction with those for adjacent and overlapping designations as appropriate.

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title:	BirdLife International Seabird Ecology and Foraging Range Database
Year:	2012
Author:	BirdLife International
Series:	http://seabird.wikispaces.com

Title:	Seabird Monitoring Programme (SMP) Database
Year:	2012
Author:	JNCC
Series:	http://jncc.defra.gov.uk/smp/Default.aspx

Title:	Wexford Harbour and Slobs SPA (004076) and the Raven SPA (004019): Conservation Objectives Supporting Document [Version 1]
Year:	2011
Author:	NPWS
Series:	Unpublished Report to NPWS

Title:	Guidelines for Winter Roost Watching
Year:	2011
Author:	O'Donoghue, B.G.
Series:	Unpublished NPWS Guidance Note

Title:	Seabird Populations of Britain and Ireland
Year:	2004
Author:	Mitchell, P.I.; Newton, S.F.; Ratcliffe, N.; Dunn, T.E.
Series:	Poyser, London

Title:	Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds.
Year:	1995
Author:	Walsh, P.; Halley, D.J.; Harris, M.P.; del Nevo, A.; Sim, I.M.W.; Tasker, M.L.
Series:	JNCC, Peterborough

Spatial data sources

Year:	2012
Title:	NPWS SPA boundary data
GIS operations:	SPA boundary polygons divided into two classifications (wetlands, terrestrial) based on line identified by expert judgement. Expert opinion used as necessary to resolve any issues arising
Used for:	Wetlands and waterbirds (map 3)

A004 Little Grebe *Tachybaptus ruficollis*

To maintain the favourable conservation condition of Little Grebe in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A005 Great Crested Grebe *Podiceps cristatus*

To maintain the favourable conservation condition of Great Crested Grebe in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A017 Cormorant *Phalacrocorax carbo*

To maintain the favourable conservation condition of Cormorant in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A037 Bewick's Swan *Cygnus columbianus*

To maintain the favourable conservation condition of Bewick's Swan in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A038 Whooper Swan *Cygnus cygnus*

To maintain the favourable conservation condition of Whooper Swan in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Light-bellied Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

To maintain the favourable conservation condition of Shelduck in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A053 Mallard *Anas platyrhynchos*

To maintain the favourable conservation condition of Mallard in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A054 Pintail *Anas acuta*

To maintain the favourable conservation condition of Pintail in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A062 Scaup *Aythya marila*

To maintain the favourable conservation condition of Scaup in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A067 Goldeneye *Bucephala clangula*

To maintain the favourable conservation condition of Goldeneye in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A082 Hen Harrier *Circus cyaneus*

To maintain the favourable conservation condition of Hen Harrier in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Roost attendance: individual hen harriers	Number	No significant decline	Wexford Harbour and Slobs SPA contains an important winter roost site for hen harriers. The five year mean peak recorded for this roost (based on the period 2005/06 - 2009/10) equates to five hen harriers. Measure based on standard survey methods (see O'Donoghue, 2011)
Suitable foraging habitat	hectares	No significant decline	Key prey items: broad diet encompassing birds and mammals. Key habitats: Wetlands, scrub, tillage, hedgerows. Estimated potential foraging area within the SPA is calculated from terrestrial areas plus aquatic (terrestrial) habitat 1889.5ha (see the conservation objectives supporting document (for waterbirds) for further information on wetland habitats). Adjacent areas outside of the SPA are also used by hen harrier during the non-breeding season albeit to an unknown extent
Roost site: condition	Area (hectares); structure	The roost site should be maintained in a suitable condition	A winter roost site occurs within Wexford Harbour and Slobs SPA and is estimated to be 14.1ha in size
Disturbance at the roost site	Level of impact	Human activities should occur at levels that do not adversely affect the Hen Harrier winter roost population	Hen Harriers are senstive to distubance at roost sites during the non-breeding season

A125 Coot *Fulica atra*

To maintain the favourable conservation condition of Coot in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

To maintain the favourable conservation condition of Grey Plover in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A142 Lapwing *Vanellus vanellus*

To maintain the favourable conservation condition of Lapwing in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A143 Knot *Calidris canutus*

To maintain the favourable conservation condition of Knot in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A144 Sanderling *Calidris alba*

To maintain the favourable conservation condition of Sanderling in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A149 Dunlin *Calidris alpina*

To maintain the favourable conservation condition of Dunlin in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A156 Black-tailed Godwit *Limosa limosa*

To maintain the favourable conservation condition of Black-tailed Godwit in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A183 Lesser Black-backed Gull *Larus fuscus*

To maintain the favourable conservation condition of Lesser Black-backed Gull in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A195 Little Tern *Sterna albifrons*

To maintain the favourable conservation condition of Little Tern at Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information for Wexford. The Seabird Monitoring Programme (SMP) also provides background data (JNCC, 2012)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995)
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	Little tern nest in well-camouflaged shallow scapes on sand and shingle beaches, spits or inshore islets (Mitchell et al., 2004). Due to the dymanic nature of Wexford Harbour, colony locations can vary from year to year
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Mainly small, often juvenile, fish; invertebrates, especially crustaceans and insects. Key habitats: Very shallow water, advancing or receding tidelines, brackish lagoons and saltmarsh creeks, sand-banks close to the coast. Foraging range: Max 11 km, mean max 6.94 km, mean 4.14 km (BirdLife International Seabird Database (Birdlife International, 2012))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of the marine waters adjacent to their breeding colonies. Foraging range: Max 11 km, mean max 6.94 km, mean 4.14 km (BirdLife International Seabird Database (Birdlife International, 2012))
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding little tern population	Little tern nest in well-camouflaged shallow scapes on sand and shingle beaches, spits or inshore islets (Mitchell et al., 2004). Due to the dymanic nature of Wexford Harbour, colony locations can vary from year to year

A395 Greenland White-fronted goose *Anser albifrons flavirostris*

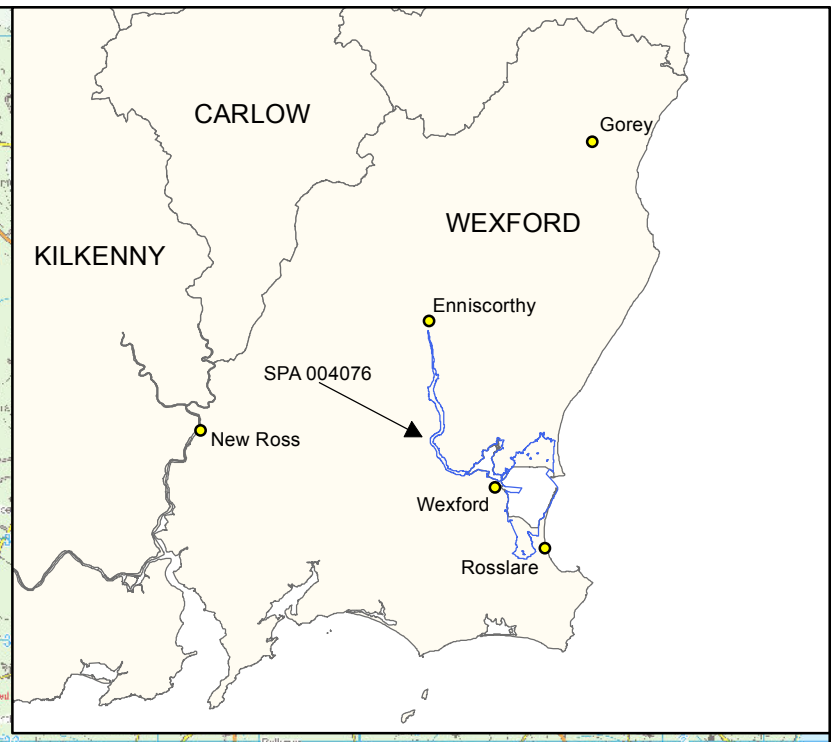
To maintain the favourable conservation condition of Greenland White-fronted Goose in Wexford Harbour and Slobs SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Wexford Harbour and Slobs SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Wetland habitat area	Hectares	The permanent area occupied by the wetland habitat (see map 3) should be stable and not significantly less than the area of 4,241ha, other than that due to natural patterns of variation	The wetland habitat area was estimated as 4,241ha using OSi data and relevant orthophotographs. For further information see parts three and five of the conservation objectives supporting document



ENNISCORTHY
Inis Córthaidh
Oilgate
Magh an nGabhar
River Slaney
An tSláine
Castlebridge
Droichead an Chaisleáin
Curracloe
Currach Pt.
WEXFORD
Loch Garman
Wexford Harbour
Cuan Loch Garman
The Raven Pt.
Rosslare Point
Rinn Ros Láir
ROSSLARE
Ros Láir
Rosslare Bay
Wexford Bay
St George's Channel

Legend

SPA 004076

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Department of Arts, Heritage and the Gaeltacht

MAP 1:
WEXFORD HARBOUR AND SLOBS SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. WEXFORD

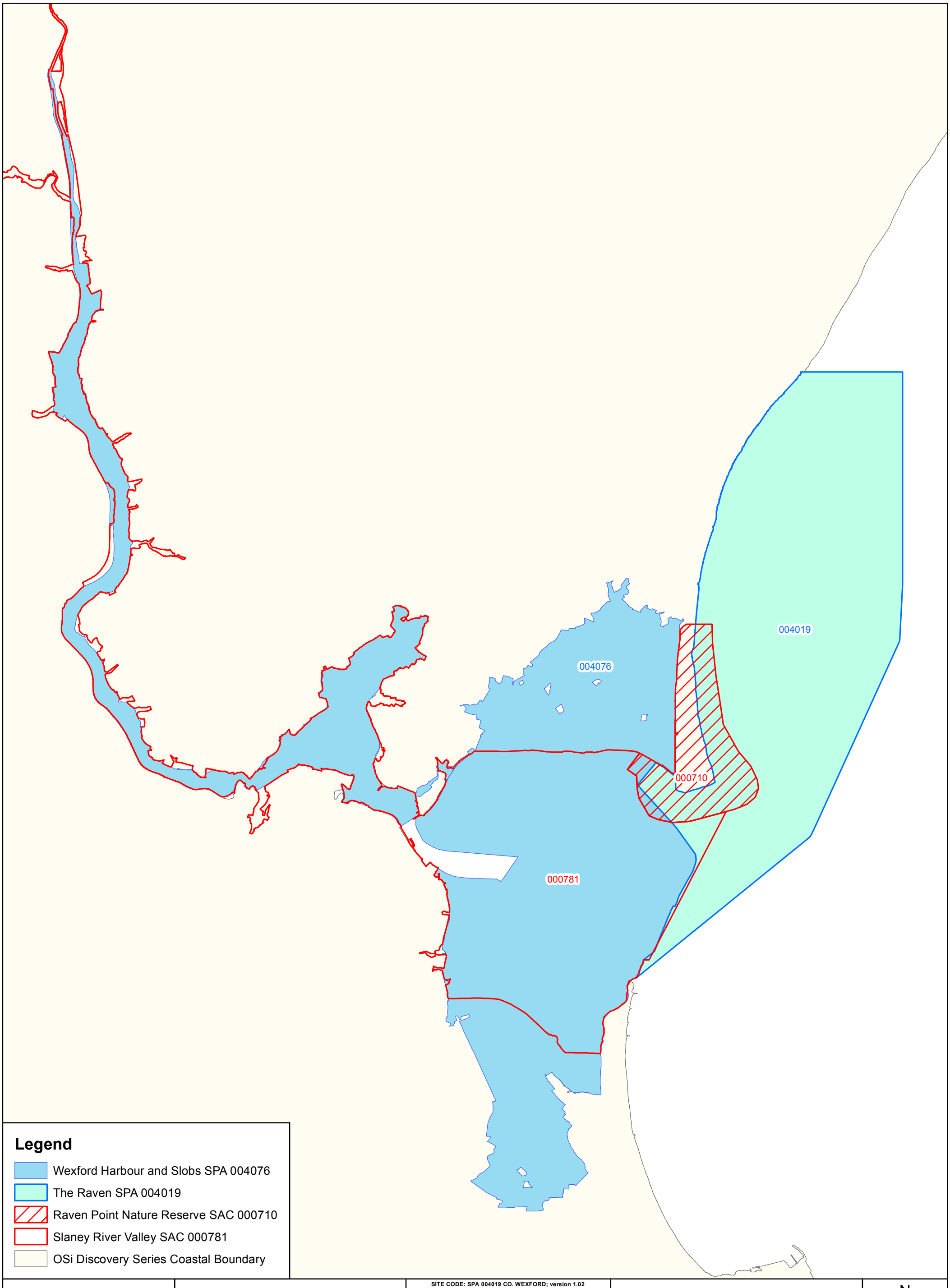
0 1 2 3 km

N

SITE CODE

SPA 004076
Version 2.04

Map Version 1
Date: March 2012



Legend

- Wexford Harbour and Slobs SPA 004076
- The Raven SPA 004019
- Raven Point Nature Reserve SAC 000710
- Slaney River Valley SAC 000781
- OSi Discovery Series Coastal Boundary

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MAP 2:
WEXFORD HARBOUR AND SLOBS SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING
DESIGNATIONS

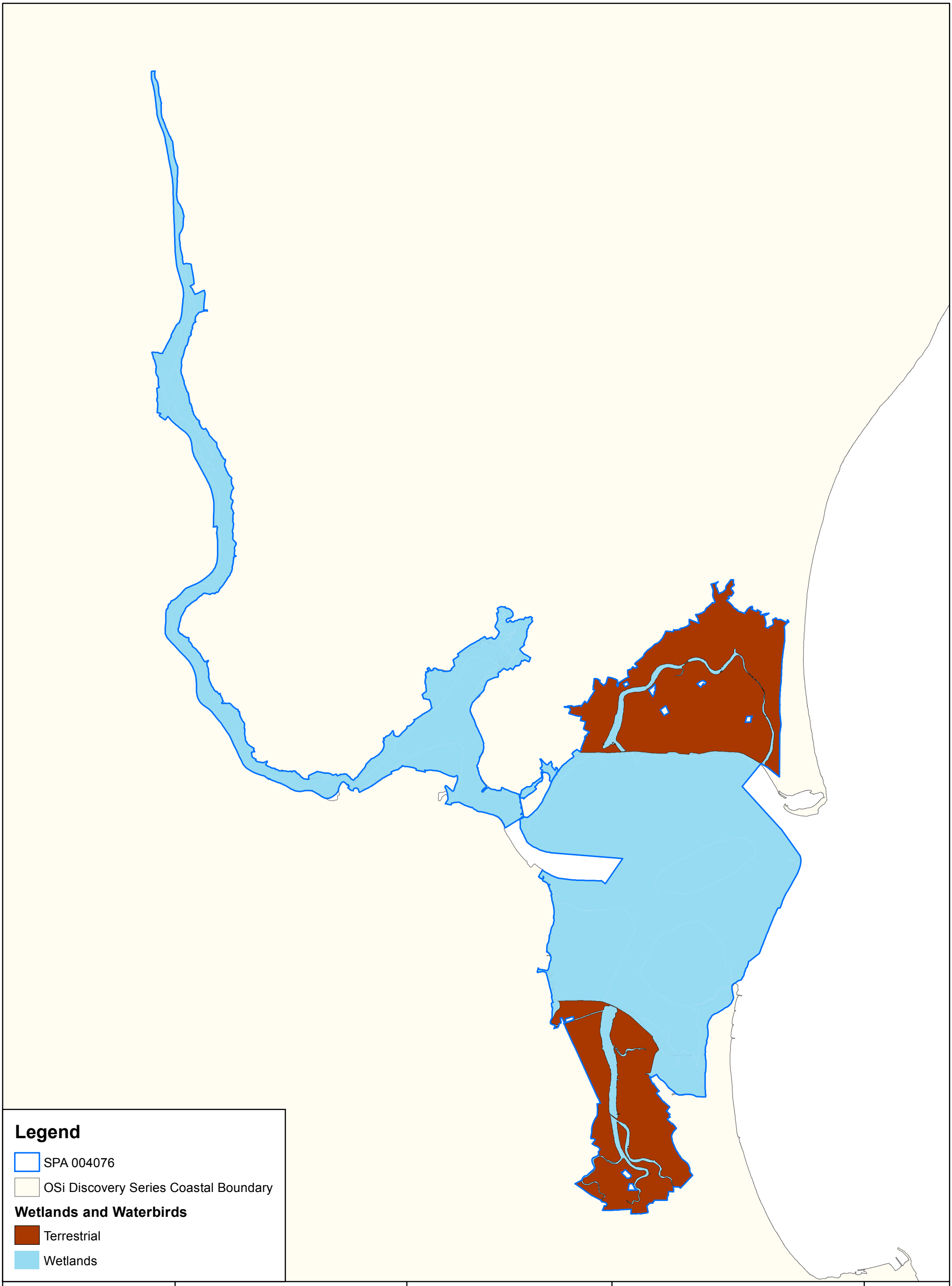
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SPA 004019 CO. WEXFORD; version 1.02
SPA 004076 CO. WEXFORD; version 2.04
SAC 000710 CO. WEXFORD; version 1
SAC 000781 CO. CARLOW; version 1.03,
CO. WICKLOW; version 1.02, CO. WEXFORD; version 1.07

0 1 2 3 km

N

Map Version 1
Date: March 2012



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MAP 3:
WEXFORD HARBOUR AND SLOBS SPA
CONSERVATION OBJECTIVES
WETLANDS AND WATERBIRDS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. WEXFORD

0 1 2 3 km

N

SITE CODE

SPA 004076
Version 2.04

Map Version 1
Date: March 2012