Applied Ecology Ireland

Proposed Bridge Replacement at Swilly Big Isle, Co. Donegal.

Natura Impact Statement

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1 INTRODUCTION

1.1 Project Background

Applied Ecology Ireland Ltd was commissioned by the Office of Public Works (OPW) to produce a Natura Impact Statement (NIS) to accompany an application for the replacement of an existing pipe culvert bridge structure (B5) along a drainage channel (D1) within Swilly Big Isle Arterial Drainage Scheme, Co. Donegal. Please refer to Figure 1.1 for a geographical context of the proposed application area.

The proposed works include demolition and removal of an existing pipe culvert bridge structure which has partially collapsed, and the construction of new pipe culvert bridge, designed in accordance with the OPW Standard Design (Please refer to Drawings: 2480-DR-003-P2 and 2480-DR-006-P1 in Appendix I).

The proposed works are located within both the Lough Swilly SAC (Site Code: 002287) and Lough Swilly SPA (Site Code: 004075).

1.2 Report Objective

This document screens and evaluates likely significant effects of the proposed project upon European designated sites (Natura 2000). A scientific and objective approach has been used to identify these Natura 2000 sites, such as hydrological and/or ecological connections, and to assess whether their conservation objectives are at risk from the development for specific reasons. This report is conducted in line with the requirements of Article 6(3) of the EU habitats Directive (92/43/EEC) and the National Parks and Wildlife Service (NPWS) Guidance for Planning Authorities (2009).

It is intended that the information contained within this document will form the basis for the Article 6(3) Appropriate Assessment process which will be completed by the Competent Authority.

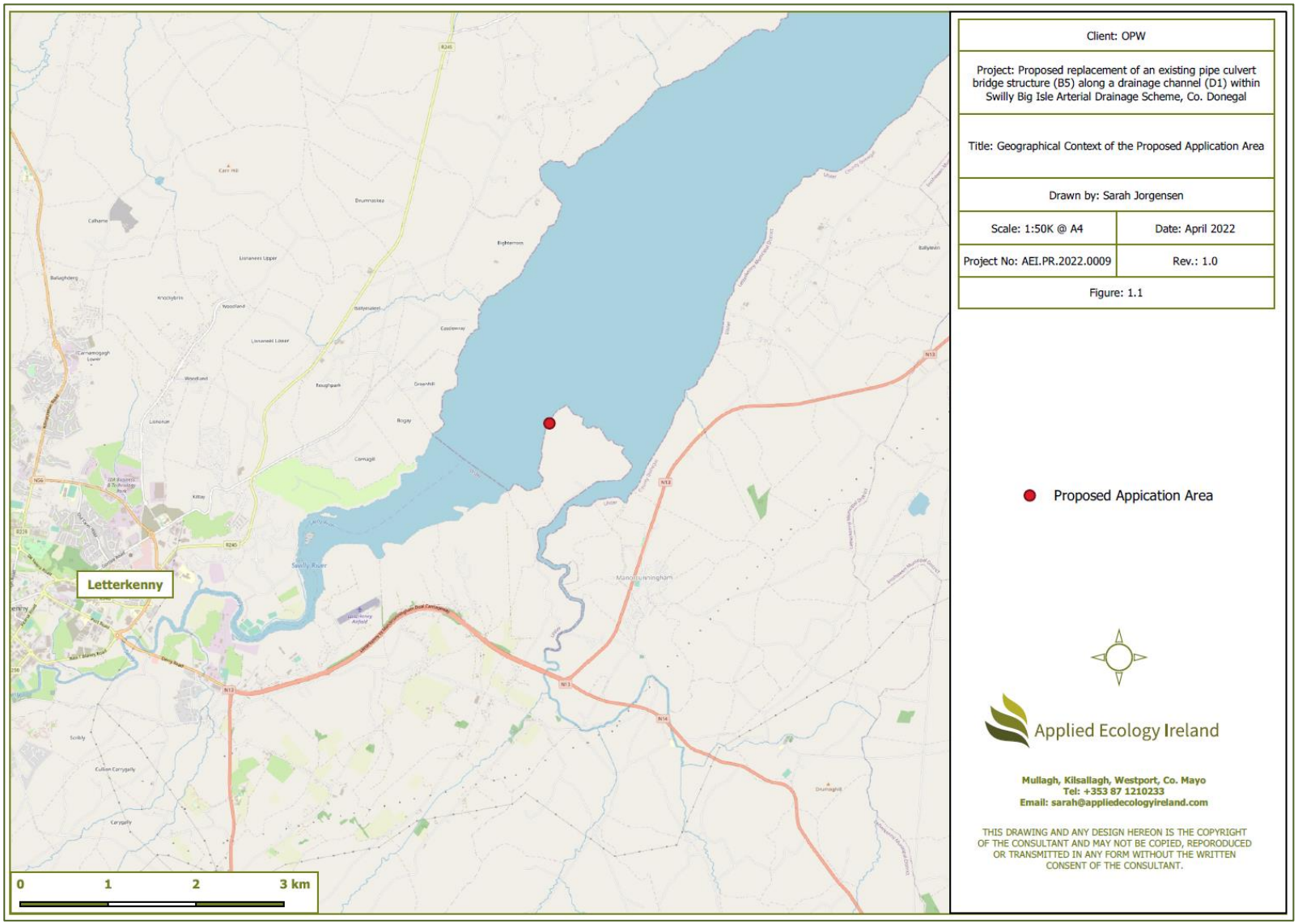

Figure 1.1: Geographical context of the proposed application area.

2 METHODOLOGY

2.1 Legislative Context

This section outlines and describes the relevant pieces of legislation within the context of Appropriate Assessment and the process by which Appropriate Assessment is undertaken.

2.1.1 Arterial Drainage Act 1945

Under the Arterial Drainage Act 1945, the Office of Public Works (OPW) is responsible for conducting maintenance at Swilly Big Isle.

OPW is the public authority and will complete a consultation process with National Parks and Wildlife Service (NPWS) on the likely significant impacts on Lough Swilly SAC/SPA.

2.1.2 Article 6 of the Habitats Directive

Article 6(3) of the Habitats Directive requires that, in relation to European designated sites (i.e. SACs and SPAs that form the Natura 2000 network), "*any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to* **appropriate assessment** *of its implications for the site in view of the site's conservation objectives*".

A competent authority (e.g. a Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned. Under Article 2(2) of the Directive, a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland and Northern Ireland, the network consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also candidate sites, which form the Natura 2000 network.

Under Article 6(4) of the Directive, if adverse impacts are likely, and in the absence of alternative options, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (IROPI), including social or economic reasons, a Member State is required to take all compensatory measures necessary to ensure the overall integrity of the Natura 2000 site. The European Commission are required to be informed of any compensatory measures adopted, unless a priority habitat type or species is present and in which case, an opinion from the European Commission is required in advance (unless for human health or public safety reasons, or of benefit to the environment).

2.1.3 Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of

Environment, Heritage and Local Government (DEHLG, 2009). These guidance documents identify a staged approach to conducting an AA, as shown Figure 2.1.

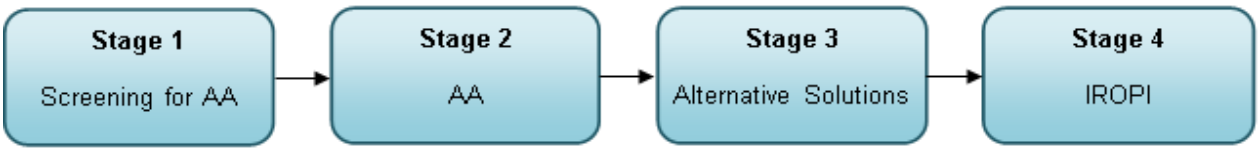

Figure 2.1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009)

2.1.2.1 Screening for Appropriate Assessment

This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. In the light of the 2017 case-law ruling [C-323/17], which concluded that "*it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site*", the current screening for appropriate assessment does not take account of measures, such as "best practice construction methods", intended to avoid or reduce the project's harmful effects on relevant Natura 2000 sites. This evaluation is presented in a Screening for Appropriate Assessment.

2.1.2.2 Appropriate Assessment

Should the screening stage find that the proposed project or plan has the potential to cause harmful effects on Natura 2000 sites, the impact of the project on the integrity of the Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function. Mitigation measures should be applied to the point where no adverse impacts on the site(s) remain. This evaluation is presented in a Natura Impact Statement (NIS).

2.1.2.3 Alternative Solutions

Should the Appropriate Assessment determine that adverse impacts are likely upon a Natura 2000 site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts. For the avoidance of doubt, the developer does not purport to place reliance on this stage.

2.1.2.4 Imperative Reasons of Overriding Public Interest (IROPI)

Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the Natura site will be necessary. European case law highlights that consideration must be given to alternatives outside the project area in carrying out the

IROPI test. It is a rigorous test which projects are generally considered unlikely to pass. In any event, the developer does not purport to place any reliance on Stage 4.

2.2 Relevant Guidance

In the preparation of this NIS, regard has been given to the EU Habitats Directive (1), Part XAB of the Planning and Development Act 2000, and to the relevant guidance, in particular:

- Brew, T., Gilligan, N. (2019) Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section, Office of Public Works, Trim, Co. Meath, Ireland.
- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities;
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government;
- European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Brussels, 28.9.2021C (2021) 6913 Final;
- European Commission (2019) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. (2019/C 33/01);
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011);
- Inland Fisheries Ireland (2021a). *Guidance Notes for AA Screenings in the Vicinity of Watercourses*.
- Inland Fisheries Ireland (2021b). *Guidance Notes for Natura Impact Statements (NIS) in the Vicinity of Watercourses*.
- National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin (2009). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities*.
- Office of the Planning Regulator (2021) Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. March 2021.

Throughout the Stage One screening report (Section 5), the line items in *italics* refer to suggested instructions for information to be contained in a screening assessment, from the guidance document '*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*', European Commission, 2001.

In order to identify potential 'In Combination Effects', other key plans and projects were identified for this area. The following plans, projects or data sources have been considered:

- Donegal County Council planning database (https://www.donegalcoco.ie/services/planning/planningapplicationsearch/)
- NPWS website (http://webgis.npws.ie/npwsviewer/)
- EPA website (https://gis.epa.ie/EPAMaps/)

- National Biodiversity Data Centre (http://maps.biodiversityireland.ie/#/Home)

2.3 Field Survey

A site visit to the proposed application area was undertaken by Sarah Jorgensen of Applied Ecology Ireland, on 11th March 2022, during which an ecological walkover survey was carried out. The ecological walkover survey was carried out to establish the baseline ecology at the proposed works location.

A habitat assessment as per Fossitt (2000) was undertaken within the proposed application area which categorised all habitats present. The baseline assessment also recorded the presence or absence of any invasive plant species, such as Japanese Knotweed *Reynoutria japonica,* within the proposed work area and the access route to same.

An otter survey was undertaken, which involved searching along the accessible riverbanks 150m upstream and 150m downstream of the proposed application area. This survey was undertaken on both sides of the drain, as per the methodology outlined in the TII (formerly NRA) publication, "*Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*" (TII, 2008). All safely accessible areas along both riverbanks were surveyed for the following otter field signs:

- Sleeping and resting places including holts, couches and natal dens
- Holts – breeding sites
- Spraints
- Pathways/trails
- Slides
- Hairs
- Footprints
- Food remains

2.4 Consultation

A consultation meeting was held on 11th February 2022 between OPW representatives, Gareth McKane (Regional OPW Engineer, Grade 3 for Donegal) and Carl Gallagher (OPW Civil Foreman for Donegal), and IFI representatives, James Doherty (IFI Environmental Officer for North Donegal) and Hugh Mooney (IFI Fisheries Officer).

IFI representatives did not express any environmental concerns about the proposed project.

2.5 Statement of Authority

2.5.1 Sarah Jorgensen MSc BSc (Hons) ACIEEM

Qualified ecologist Ms Sarah Jorgensen (nee Ingham) graduated in from Anglia Ruskin University, Cambridge with a BSc. (Hons) in Zoology. Following her undergraduate degree, she attained her MSc. in Biodiversity and Conservation from Trinity College Dublin, graduating in 2009.

Sarah has recently established her own company, Applied Ecology Ireland Ltd, offering her expertise in ecological consultancy. Sarah is an ecologist with experience in managing large teams of bird, mammal and habitat surveyors on a number of national ecological projects, in addition to analysing all data gathered by these teams.

A large part of Sarah's work also involves the output of expertise and recommendations regarding Appropriate Assessments and Environmental Impact Assessments of large-scale developments throughout Ireland. Her day-to-day work regularly includes designing detailed mitigation measures based on constraints regarding various types of developments, as well as undertaking desk-top research into other matters relating to ecological conservation in Ireland. She is highly experienced with 13 years post graduate practice as a professional ecologist. Sarah also has experience as an Ecological Clerks of Works (ECoW) working with developers on wind farm construction sites, overseeing the implementation and adherence to both wildlife and environmental regulations and providing advice on compliance with the environmental planning conditions.

Sarah carried out the ecological field work for this project and is the author of this report.

3 PROJECT DESCRIPTION

3.1 Proposed Site Access

The site is located approximately 3km to the north of the N13 dual carriageway. The site can be accessed along a private track to a farmyard and then through well-drained agricultural land. (Figure 3.1).

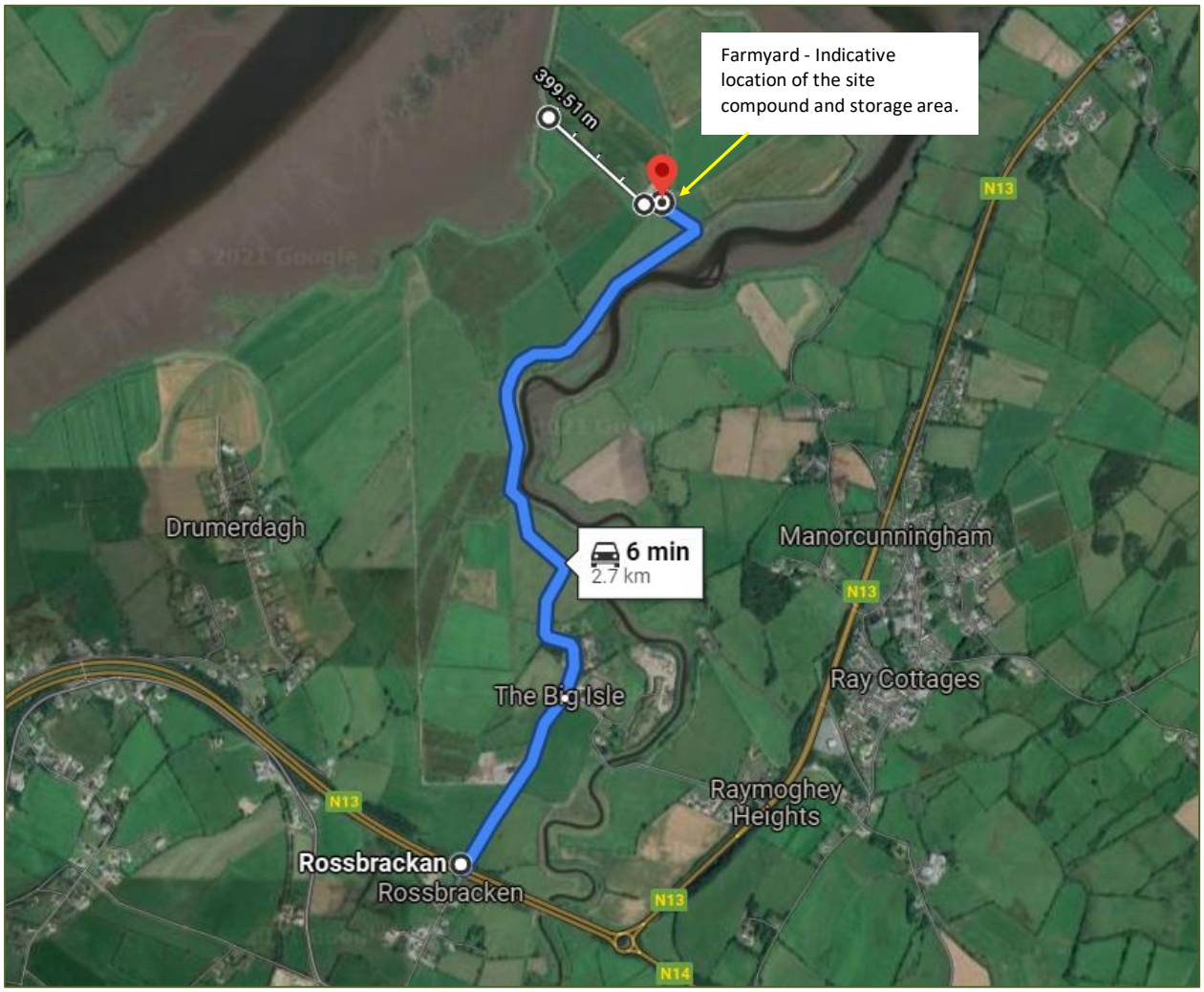

Figure 3.1: Road access to the application site from the N13.

3.2 Proposed Work Methods

3.2.1 Site Management

Prior to works beginning, a site compound shall be established with designated areas for:

- Welfare Facilities
- Vehicle Parking
- Plant Storage

- Equipment Storage
- Materials Storage

The site compound for welfare facilities, vehicles, equipment and materials storage facilities will be located at the farmyard (Figure 3.2).

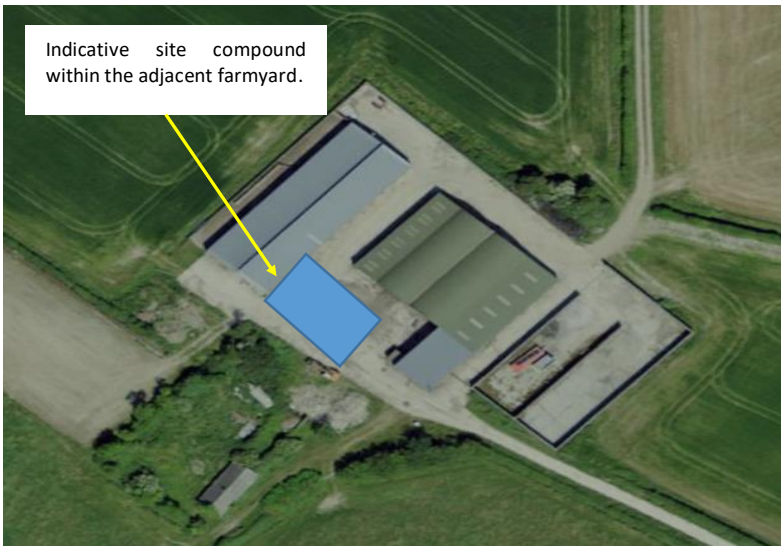

Figure 3.2: Site compound location within the adjacent farmyard.

3.2.2 Site Preparation

The works area shall be fenced off to provide safety and security. Livestock fencing shall be installed given the location of the works within agricultural land. No works shall begin before the site works area is fully fenced off and secure.

Works will be carried out in a period of sustained dry weather. The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground powerlines or if there is a requirement for the use of bog mats.

From the most recent site inspection, it is not envisaged that bog mats will be required for this site. There was also no evidence of underground services or overhead power lines observed in the vicinity of the works area. On all occasions, the excavator operator must be satisfied with the ground conditions upon which they intend to work from.

When the excavator operator decides to position the excavator adjacent to the drain bank, they must ensure the bank is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

3.2.3 Dewatering of Works Area and Excavations

The western bank of D1 is composed of the E1 Lough Swilly embankment and an approximately 7m wide strip of land for access along the embankment.

The method of de-watering the works area will be decided upon after mobilisation to site. Consideration will be given to ground conditions and flow rates. The following options will be considered:

- Damming and channel diversion; or
- Damming and over-pumping.

3.2.3.1 Damming and Channel Diversion

If a channel diversion is to take place, this will be carried out on the western bank. A diversion channel will be excavated from a point upstream of the existing pipe bridge and will tie back into the channel at a point downstream of the pipe bridge. A temporary pipe culvert will be installed into the diversion channel and will be stoned over. The temporary pipe will allow the D1 to flow during the works. Please see Figure 3.3 Site Layout.

Damming will be carried out immediately downstream of the channel diversion location and at a point just upstream of where the diversion channel reconnects with the working channel to ensure a dry working zone.

HDPE plastic piping may be used if the ground is required to be reinstated to facilitate works, which will also mitigate against the transfer of sediment. Dewatering of works area/excavations will be carried out in accordance with EP 15 Construction Silt Management. Silt management will be carried out in such a way as to eliminate/minimise the silt load downstream of the works with the use of silt curtains, straw bales, HDPE plastic pipes with baffle boards at inlet to bypass channel etc. The dam will be constructed using locally sourced clay material, compacted in 225mm layers along with sandbags. The dam will be constructed to allow a sufficient freeboard above the water level.

The most likely option in this case to minimise silt transfer from the channel diversion will be to dam the downstream reconnection point by compacting some bales of straw held in place with suitably sized boulders/rock.

The appropriate no. of straw bales required will be assessed on site and installed as necessary.

This will help to trap the sediment which would otherwise be redeposited into the main channel. This point will be positioned just before the diversion channel reconnects with the main channel.

3.2.3.2 Damming and Over-Pumping

There are two sluice gates located upstream and downstream from the existing bridge, Sl1 and Sl3 respectively. These will the bunded off in the channel on the bridge side of the sluices. This will allow for the D1 to drain out naturally. Any residual water that is left in the channel can be pumped from the excavation area sump which can be released onto grassland at an appropriate distance from the channel to allow natural filtration to occur through the in-situ grasses/soils. This would be the appropriate measure for low flow conditions. Pump hoses shall be placed at a location that does not pose a tripping hazard to personnel and away from the plant operations.

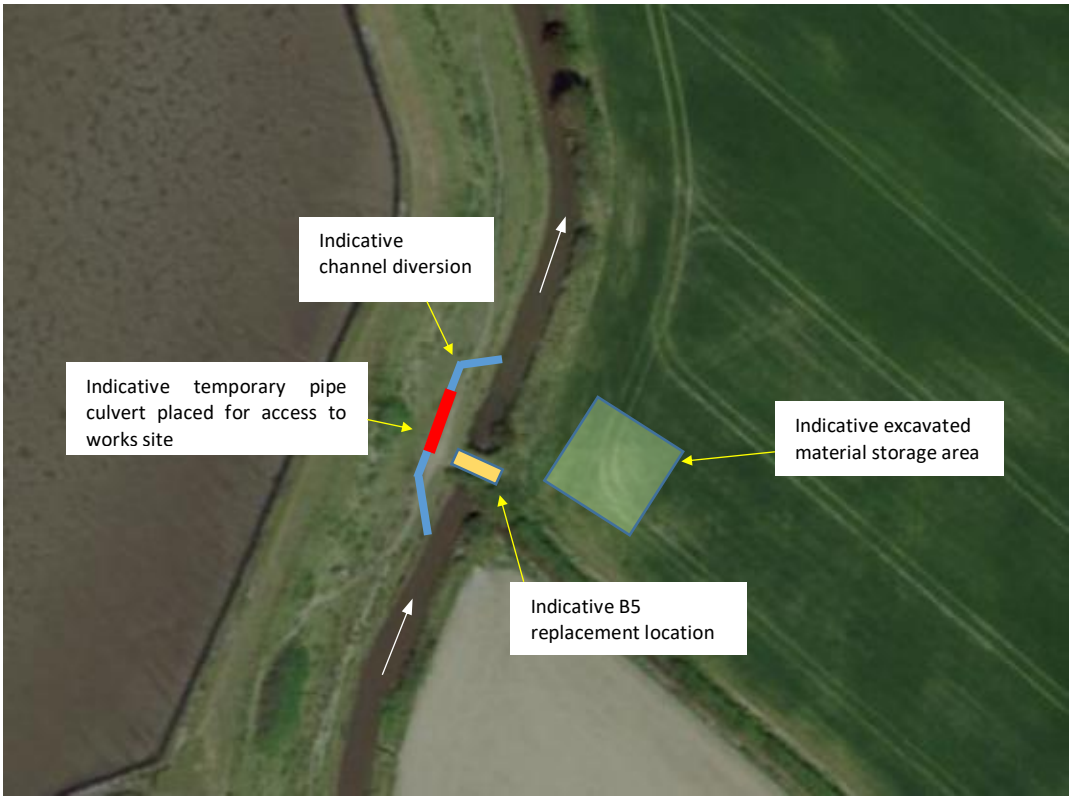

Figure 3.3: Proposed site layout.

It should be noted damming will be required for both scenarios. It is not possible to clarify at this time whether damming/over-pumping or a damming/channel diversion will be required. This will be dependent on the existing channel flow conditions at the time of mobilisation to the site. Over pumping will be carried out if there are minimal flow conditions in the channel.

3.2.4 Construction of New Pipe Structure

The works should take place in a sustained period of dry weather.

The new pipe culvert bridge will be constructed in accordance with the following OPW standard design drawings:

- 2480-DR-003-P2
- 2480-DR-006-P1

See Appendix I for copy of drawing.

3.2.4.1 Demolition, Excavations and Foundations

Demolition works will be carried out in the dry working zone after placement of cofferdams on the upstream section of channel and installation of diversion channel or over pumping.

The existing structure will be removed using a hydraulic excavator, operated by an experienced and trained operative. Material will be removed from the area and can used as backfill if appropriate. If the material is to be stored on-site prior to removal, it must be stored in an area away from the channel and works area not less than 30 metres.

The area around the existing bridge will be excavated to a suitable width and depth as per the requirements of the new bridge design. The invert level of the existing downstream pipe culvert shall be recorded.

The channel bed shall be excavated to an appropriate level to allow formation of an adequate base for the foundation of the bridge.

The ground conditions will be examined, and a decision will be made by the Site Foreman and Engineer as to material needed for pipe bedding and concrete foundations. Should it be decided that the ground conditions are poor, imported clean broken stone (3”) and granular material (Cl.804) shall be placed and compacted along with lean-mix concrete to create the formation level. The formation level should be level and checked using a rotating laser level.

The foundation for the end-wall and wing-walls will be formed using peri shuttering. Two layers of A393 mesh reinforcement shall be used in the foundation if ground conditions are poor. 40mm cover shall be maintained between the reinforcement and the external finish of the concrete.

3.2.4.2 Pipe Placement

The 6m x 0.9m diameter HDPE plastic corri-pipe shall be lifted into place using the tracked excavator. The pipe will be haunched with lean-mix concrete to a depth of 500mm on all sides.

3.2.4.3 Headwall, Parapet Wall and Wing Walls Placement

The end walls shall be formed around the upstream pipes as per the design drawing. Peri Formwork shall be used to form the end walls and wing-walls. The end-walls shall be formed to reach upwards and create a foundation for the parapet walls.

The formwork for wing-walls shall be erected as per manufacturer/supplier instructions. Wing-walls are to be constructed as per OPW standard design drawings. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the wing-walls and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Place granular material (3” broken stone and Cl.804) above the lean-mix concrete to the finished level of the bridge crossing.

The formwork for parapet walls shall be erected as per manufacturer/supplier instructions. Walls are to be 250mm thick and a minimum height of 1,200mm above the bridge deck. Dowels are to be fixed for parapets. Ready-mix concrete (as per specification outlined on design drawings) shall be placed in the parapets and vibrated using a poker vibrator. Formwork can be removed following adequate curing of the concrete (as per Engineer/Foreman instruction).

Cofferdams and the temporary pipe culvert will be removed, and diversion channel re-instated to allow the D1 to flow naturally again.

3.2.5 Timing of the Proposed Works

Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. It is intended to carry out works in May 2022.

3.3 Completion of Works

Following the completion of the works, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation by ensuring the following:

- Boundaries shall be re-established to the landowner's satisfaction.
- A photographic survey of the completed works shall be carried out by the Site Foreman.
- Records of any utility diversions and their locations shall be maintained and filed appropriately.
- A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.
- Landowner to be asked to fill out Landowner Satisfaction Form while adhering to Covid-19 Protocol.

4 RECEIVING ENVIRONMENT

4.1 Proposed Application Area

4.1.1 Field Survey

During the site visit on 11th March 2022, an overview of dominant habitats was undertaken within the proposed work area and classified as per Fossitt (2000).

The dominant aquatic habitat within the proposed application area is the Channel D1, which is classified as a **drainage ditch (FW4)** (Plate 4.1). Channel D1 has a base width of less than 3m and is therefore classified as a minor channel for arterial drainage purposes. The flow and water levels in the channel will vary depending on recent rainfall patterns and time of year. There are areas of **reedbed (FS1)** growing within the channel both upstream and downstream of the pipe culvert (Plates 4.2 – 4.3).

The dominant habitats on either side of the drainage ditch within the proposed work area are **improved agricultural/wet grassland (GA1/GS4)** with patches of **bramble scrub (WS1)** (also shown in Plates 4.2 – 4.3).

There were no Annex I habitats recorded during the ecological walkover survey. Furthermore, there were invasive plant species recorded onsite.

The otter survey yielded no evidence of breeding otter *Lutra lutra* in terms of active holts, slides or couches within the 150m either side of the works areas on both sides of the river.

Plate 4.1: Channel D1 (FW4) from the downstream side of the bridge culvert.

Plate 4.2: Area of reedbed habitat (FW4) within the channel upstream of the bridge culvert, also showing improved agricultural/wet grassland (GA1/GS4) on the western side of the channel, and bramble scrub (WS1) both on the bridge culvert and on the eastern side of the channel.

Plate 4.3: The western bank on the downstream side of the bridge culvert, showing rough improved agricultural/wet grassland (GA1/GS4), bramble scrub (WS1) and reed bed (FS1).

4.2 Natura 2000 Sites

4.2.1 Scoping Study - Identification of Relevant Natura 2000 Sites

Section 3.2.3 of the Guidance for Planning Authorities (DoEHLG, 2010) states that the approach to screening can be different for different plans and projects and will depend on the scale and the likely effects of the project. A key variable that will determine whether or not a particular European Site is likely to be negatively affected is its physical distance from the project site and whether there are any pathways for effect linking the project to these sites.

Generally, UK guidance (Scott Wilson *et al*., 2006) state that a distance of 15km is currently recommended as the likely Zone of Impact (ZoI) in the case of plans on European Sites and is sufficient to cover the geographic extent over which significant ecological effects are likely to occur. For projects, the guidance recognises that the likely ZoI could be much less than 15 km, and in some cases, less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivity of the ecological receptors, in addition to the potential for in combination effects.

Using the Source » Pathway » Receptor approach (OPR, 2021) and having regard for the location, the nature of the works, and the small size and scale of the proposed project, it is considered for the purpose of this screening exercise that the likely ZoI on designated sites is the zone immediately around the construction site, in addition to any sites with a hydrological connection downstream of the works and/or with an ecological connection, where distance would be dependent on the qualifying interests of the site. A review of the National Parks and Wildlife Service database has identified following European Site with potential Source » Pathway » Receptor links to the proposed works (Figure 4.1):

- Lough Swilly SAC (Site Code: 002287)
- Lough Swilly SPA (Site Code: 004075)

The pathways for potential effects are identified in Table 4.1.

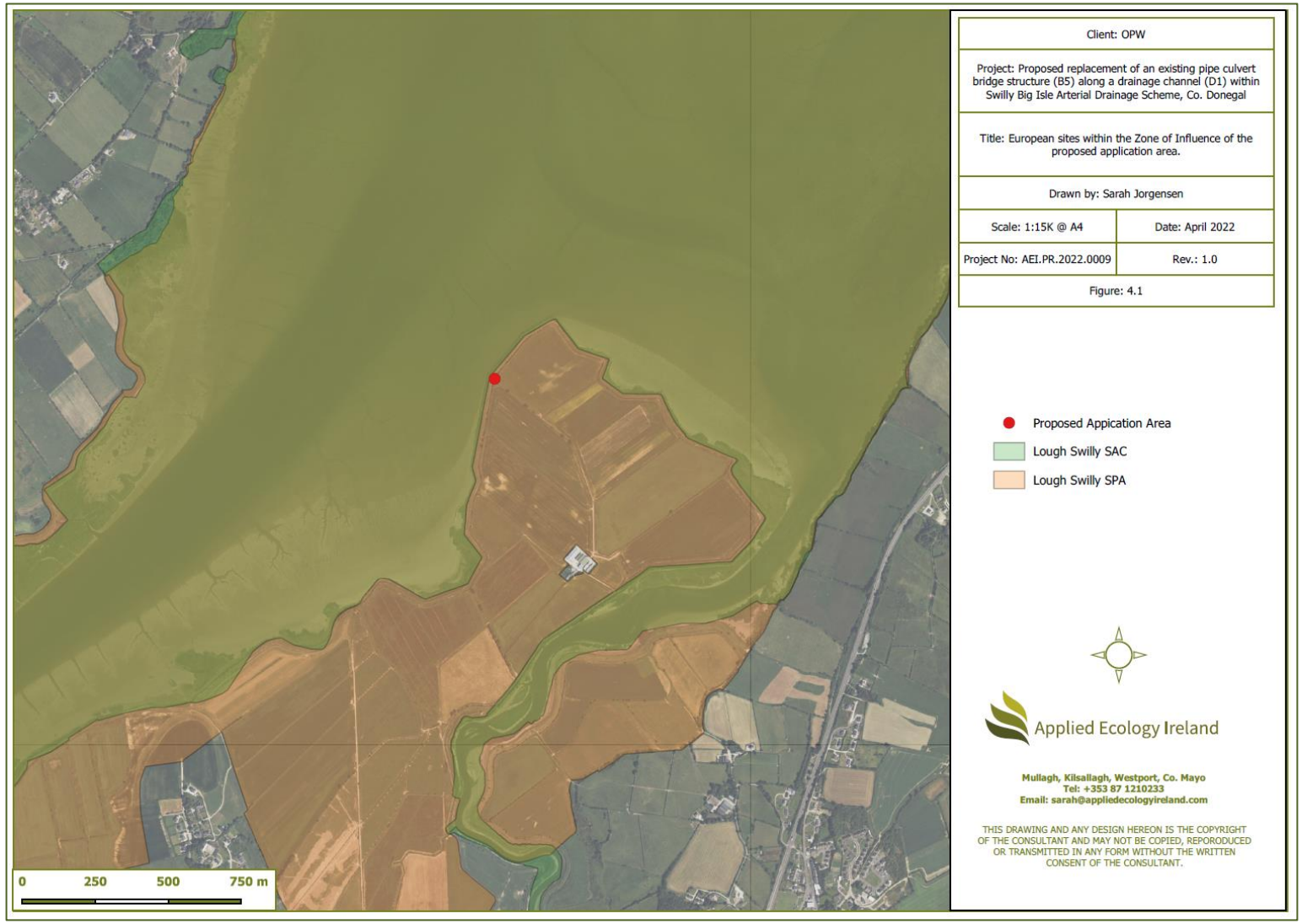

Figure 4.1: European sites within the Zone of Influence of the proposed application area.

Table 4.1: Scoping Study: Identification of pathways for likely significant effects on European sites within the Zone of Influence of the application area.

EU Site	Primary reason(s) for selection of site	Approximate distance from proposed application area	Screening Required (Y/N)
Lough Swilly SAC (Site Code: 002287)	**Priority Annex I Habitats** [1150] Coastal Lagoons* **Annex I Habitats** [1130] Estuaries [1330] Atlantic Salt Meadows [6410] Molinia Meadows [91A0] Old Oak Woodlands **Annex II Species** [1355] Otter (*Lutra lutra*)	The proposed application area is located **within this SAC**.	**Yes.** The proposed application area is hydrologically connected with this SAC. As such, potential effects of the proposed works on the qualifying interests of this SAC **will be evaluated further in the following screening assessment.**
Lough Swilly SPA (Site Code: 004075)	**Annex I/II Species** A005 Great Crested Grebe *Podiceps cristatus* A028 Grey Heron *Ardea cinerea* A038 Whooper Swan *Cygnus cygnus* A043 Greylag Goose *Anser anser* A048 Shelduck *Tadorna tadorna* A050 Wigeon *Anas penelope* A052 Teal *Anas crecca* A053 Mallard *Anas platyrhynchos* A056 Shoveler *Anas clypeata* A062 Scaup *Aythya marila* A067 Goldeneye *Bucephala clangula* A069 Red-breasted Merganser *Mergus serrator* A125 Coot *Fulica atra*	The proposed application area is located **within this SPA**.	**Yes.** The proposed application area is hydrologically connected with this SPA. As such, potential effects of the proposed works on the special conservation interests of this SPA **will be evaluated further in the following screening assessment.**

EU Site	Primary reason(s) for selection of site	Approximate distance from proposed application area	Screening Required (Y/N)
	A130 Oystercatcher *Haematopus ostralegus* A143 Knot *Calidris canutus* A149 Dunlin *Calidris alpina* A160 Curlew *Numenius arquata* A162 Redshank *Tringa totanus* A164 Greenshank *Tringa nebularia* A179 Black-headed Gull *Chroicocephalus ridibundus* A182 Common Gull *Larus canus* A191 Sandwich Tern *Sterna sandvicensis* A193 Common Tern *Sterna hirundo* A395 Greenland White-fronted goose *Anser albifrons flavirostris* A999 Wetlands and Waterbirds		

The following EU sites, which overlap one another at the proposed application area, will undergo Stage 1 Screening for Appropriate Assessment:

- Lough Swilly SAC (Site Code: 002287)
- Lough Swilly SPA (Site Code: 004075)

4.2.2 Lough Swilly SAC (Site Code: 002287)

4.2.2.1 Summary Site Description

This large site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly. It extends from below Letterkenny to just north of Buncrana. Lough Swilly is a long sea lough, cutting through a variety of metamorphic rocks on the west side of Inishowen. The main rivers flowing into the site are the Swilly, Lennan and Crana. At low tide, extensive sand and mudflats are exposed, especially at the mouths of the Swilly and Lennan rivers. The site is estuarine in character, with shallow water and intertidal sand and mudflats being the dominant habitats.

This site is of conservation importance as it contains good examples of at least five habitats listed on Annex I of the E.U. Habitats Directive (estuaries, lagoons, Atlantic salt meadows, *Molinia* meadows, old oak woods) and supports a population of Otter. In addition, it is of high ornithological importance for wintering waterfowl, with 16 species occurring regularly in numbers of national importance, plus three species occurring within the site and on adjacent polders in numbers of international importance.

4.2.2.2 Qualifying Interests of Lough Swilly SAC

The features of qualifying interest of the SAC are outlined in Table 4.2.

Table 4.2: Qualifying interests for Lough Swilly SAC (* denotes priority Annex I habitats)

	Natura Code	Item Description
Annex I Habitats	1130	Estuaries
	1150	Coastal Lagoons*
	1330	Atlantic Salt Meadows
	6410	Molinia Meadows
	91A0	Old Oak Woodlands
Annex II Species	1355	Otter

4.2.2.3 Conservation Objectives of the Lough Swilly SAC

Site-specific conservation objectives aim to define favourable conservation condition for the particular habitat or species at that site (NPWS, 2011)[1]. Please see Appendix II for the complete conservation objectives document. The generic conservation objectives for the Lough Swilly SAC are:

- *Objective 1:* To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected (as listed in Table 4.2).
- *Objective 2*: To maintain the extent, species richness and biodiversity of the entire site.
- *Objective 3:* To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

4.2.3 Lough Swilly (Site Code: 004075)

4.2.3.1 Summary Site Description

Lough Swilly SPA comprises the inner part of Lough Swilly from just east of Letterkenny northwards to Killygarvan (*c*. 2 km north of Rathmullan) on the west side and to *c*. 2 km south of Buncrana on the east side; it includes the adjacent Inch Lough. Also forming part of the site is a series of improved pasture and arable fields on the south side of Lough Swilly between Farsetmore and Inch Levels – these are of importance to geese and swans. It includes sections of the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is a series of extensive sand and mud flats which are exposed at low tide - both estuaries and sand/mud flats are listed on Annex I of the E.U. Habitats Directive. Other habitats represented in the site are salt marshes, lagoons (at Inch Lough and Blanket Nook), rivers and streams, sand and shingle beaches, lowland wet and dry grasslands, drainage ditches, reedbeds and scrub. Inch Lough, whilst artificial in origin, is one of the largest and best examples of a shallow, low salinity lagoon in the country; it supports what is probably the largest population in the country of the Red-listed charophyte *Chara canescens*. A small sandy island, used by nesting terns, swans and gulls, occurs in the southern part of the lagoon.

Lough Swilly SPA is of major ornithological importance for wintering waterbirds, with three species occurring in numbers of international importance and 18 occurring regularly in numbers of national importance. The site is regularly used by more than 20,000 waterfowl and as such is of international importance. Additionally, it holds nationally important breeding populations of three species, i.e. Sandwich Tern, Common Tern and Black-headed Gull. The site is used by a good range of species that are listed on Annex I of the E.U. Birds Directive. Part of Lough Swilly SPA is a Wildfowl Sanctuary.

4.2.2.2 Special Conservation Interests of Lough Swilly SPA

The features of special conservation interests of the SPA are outlined in Table 4.3.

[1] NPWS (2011) Conservation Objectives: Lough Swilly SAC 002287. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, and the Gaeltacht.

Table 4.3: Special conservation interests of Lough Swilly SPA

	Natura Code	Item Description
Annex I/II Species	A005	Great Crested Grebe
	A028	Grey Heron
	A038	Whooper Swan
	A043	Greylag Goose
	A048	Shelduck
	A050	Wigeon
	A052	Teal
	A053	Mallard
	A056	Shoveler
	A062	Scaup
	A067	Goldeneye
	A069	Red-breasted Merganser
	A125	Coot
	A130	Oystercatcher
	A143	Knot
	A149	Dunlin
	A160	Curlew
	A162	Redshank
	A164	Greenshank
	A179	Black-headed Gull
	A182	Common Gull
	A191	Sandwich Tern
	A193	Common Tern
	A395	Greenland White-fronted goose
	A999	Wetlands and Waterbirds

4.2.2.3 Conservation Objectives of Lough Swilly SPA

Site-specific conservation objectives aim to define favourable conservation condition for the particular habitat or species at that site (NPWS, 2011)[2]. Please see Appendix II for the complete conservation objectives document. The generic conservation objectives for Lough Swilly SPA are:

- *Objective 1:* To maintain or restore the favourable conservation condition of the Annex I and II bird species and their habitats the for which the SPA has been selected (as listed in Table 4.3).
- *Objective 2*: To maintain the extent, species richness and biodiversity of the entire site.
- *Objective 3:* To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

[2] NPWS (2011) Conservation Objectives: Lough Swilly SPA 004075. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, and the Gaeltacht.

5 STAGE 1 – SCREENING FOR APPROPRIATE ASSESSMENT

5.1 Introduction

The proposed replacement of an existing pipe culvert bridge structure (B5) along a drainage channel (D1) within Swilly Big Isle Arterial Drainage Scheme is not connected with, or necessary for the nature conservation management of the Lough Swilly SAC/SPA. Consequently, the screening will focus on evaluating the likely effects of the proposed works on the designated EU sites identified.

5.2 Potential Risks to EU Sites

This section both identifies the potential risk which may arise as a result of the proposed works, and how these could potentially affect the qualifying interests within the identified EU sites. The pathways and mechanisms of exposure to each of the identified risks are evaluated. The significance of potential effects is evaluated, with any potential in-combination effects also identified.

5.2.1 Potential Risks as a Result of the Proposed Project

The following are risks to Lough Swilly SAC/SPA that have the potential to arise as a result of the proposed pipe culvert bridge replacement works:

- ***Deterioration in water quality*** – Given that the proposed work area is located within the SAC and SPA, the proposed works have the potential to result in indirect effects on the qualifying and special conservation interests of the SAC and SPA, respectively. Freshwater aquatic habitats and species have the potential to be affected through the risk of contamination of surface water within Channel D1 which flows into Lough Swilly by virtue of the following:
    - The release of hydrocarbons into the surface water system by virtue of working with machinery in close proximity to Channel D1, and thus, the downstream Lough Swilly.
- ***Disturbance/displacement*** – The proposed works have the potential to result in direct effects on otter by virtue of noise and vibration caused by machinery.

5.3 Evaluation of Likely Effects

This section evaluates the potential risks the proposed works to Lough Swilly SAC and Lough Swilly SPA, as outlined in Section 5.2 and the significance of these potential risks on each feature of qualifying and special conservation interest of the SAC and SPA, respectively. Please refer to Table 5.1. Note that qualifying and special conservation interests in **bold type** denote those upon which likely significant effects are foreseen.

Table 5.1: Evaluation of potential risks and their level of potential effect on features of qualifying and special conservation interest of Lough Swilly SAC/SPA.

EU Site	Qualifying Interests	Evaluation of Potential Risks	Potential Exposure to Risk and Mechanism of Effect, if known
Lough Swilly SAC	**Estuaries**	This marine habitat dominates Lough Swilly (NPWS, 2011) and is hydrologically connected to the proposed application area via the downstream sluice gate at which the water from drainage channel D1 enters Lough Swilly. As such, there is a pathway for likely significant effects on this qualifying interest of the SAC as a result of the proposed works.	The risk to this marine habitat through indirect effects by virtue of potential deterioration of water quality due to the release of hydrocarbons into the drainage channel D1 and as such, into the downstream Lough Swilly is considered to be significant. Therefore, a pathway for likely significant effects exists. ***Conclusion:*** ***Likely significant effects***
	Coastal Lagoons*	There are two coastal lagoons identified within the SAC, namely Blanket Nook and Inch Lough (NPWS, 2011). Blanket Nook is located at a hydrological distance of approximately 11km to the northeast of the proposed application area on the eastern shore of Lough Swilly. Inch Lough is further north, also on the eastern shore of the lough, at a hydrological distance of approximately 15km. Therefore, pathways for likely significant effects on this habitat as a result of the proposed works do not exist.	The risk to this coastal habitat is not considered to be significant, given that it does not occur within the Zone of Influence of the proposed works location. Therefore, no pathways for likely significant effects exist. *Conclusion:* *No likely significant effects*

EU Site	Qualifying Interests	Evaluation of Potential Risks	Potential Exposure to Risk and Mechanism of Effect, if known
Lough Swilly SAC	**Atlantic Salt Meadows**	Areas of potential Atlantic salt meadows occur along the northern edge of the Big Isle Peninsula (NPWS, 2011), which is within the Zone of Influence of the proposed works. As such, there is a pathway for likely significant effects on this qualifying interest of the SAC as a result of the proposed works.	The risk to this coastal habitat through indirect effects by virtue of potential deterioration of water quality due to the release of hydrocarbons into the drainage channel D1 and as such, into the downstream Lough Swilly is considered to be significant. Therefore, a pathway for likely significant effects exists. ***Conclusion:*** ***Likely significant effects***
	Molinia Meadows Old Oak Woodlands	Neither of these two terrestrial habitats occur within the Zone of Influence of the proposed application area. Therefore, pathways for likely significant effects on this habitat as a result of the proposed works do not exist.	The risk to these two terrestrial habitats is not considered to be significant, given that neither habitat occur within the Zone of Influence of the proposed works location. Therefore, no pathways for likely significant effects exist. *Conclusion:* *No likely significant effects*
	Otter	No signs of otter breeding activity such as holts or spraints were observed or recorded in the 150m upstream and downstream of the proposed work location. However, Otters are ubiquitous throughout this SAC and as such, are susceptible to disturbance by virtue of noise and vibrations from the proposed works.	The risks to otter through indirect effects by virtue of potential noise and vibration and secondary effects through deterioration of water quality due to the release of hydrocarbons into drainage channel D1 are considered to be significant.

EU Site	Qualifying/Special Conservation Interests	Evaluation of Potential Risks	Potential Exposure to Risk and Mechanism of Effect, if known
		Furthermore, the risk to fish species as a result of a deterioration in water quality due to a potential release of hydrocarbons into the watercourse, also has the potential to cause secondary effects on otter through potential effects on prey species. As such, there is a pathway for likely significant indirect and secondary effects on this qualifying interest of the SAC as a result of the proposed works.	***Conclusion:*** ***Likely significant effect***
Lough Swilly SPA	**Species of special conservation interest listed in Table 4.3 and their habitats.**	There is a risk to the foraging habitats of these waterbird species as a result of a deterioration in water quality due to a potential release of hydrocarbons into the watercourse. As such, there is a pathway for likely significant indirect and secondary on these special conservation interests of the SPA as a result of the proposed works.	The risks to these bird species of special conservation interest through indirect effects by virtue of potential deterioration of water quality due to the release of hydrocarbons into drainage channel D1 are considered to be significant. ***Conclusion:*** ***Likely significant effect***

5.4 Potential In-combination Effects

It is a requirement of Article 6(3) of the Habitats Directive that an assessment is conducted to determine if significant effects of a plan or project are likely alone and also in combination with other plans or projects. The following section discusses potential in-combination effects that may arise.

A review of the Donegal County Council's online planning database on 21st April 2022 reveals that there are no other planned or consented developments in the vicinity of the proposed development which could act in-combination with the proposed project to result in any effects on Lough Swilly SAC and SPA or on any of their qualifying/special conservation features for which these sites are of European importance.

5.5 Screening for Appropriate Assessment Matrix

The following matrix summarises the screening process that has been undertaken as part of this evaluation.

Table 5.2: Screening for AA Matrix

Screening Criterion	Screening Result
Brief description of the project or plan	OPW proposes to carry out a replacement of an existing pipe culvert bridge structure (B5) along a drainage channel (D1) within Swilly Big Isle Arterial Drainage Scheme, Co. Donegal.
Brief description of the Natura 2000 sites	• Lough Swilly SAC (Site Code: 002287) • Lough Swilly SPA (Site Code: 004075) *Relevant features of the sites are described in Section 4.2.*
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	***Indirect effects on features of qualifying/special conservation interest of Lough Swilly SAC and Lough Swilly SPA*** Pathways exist for potential indirect effects on the following features of qualifying/special conservation interest by virtue of **a deterioration in water quality as a result of the potential release of hydrocarbons into the watercourse within the proposed works area**: • Estuaries • Atlantic Salt Meadows • Otter • Bird species of special conservation interest listed in Table 4.3 and their habitats.

Screening Criterion	Screening Result
	Direct disturbance effects on local otter populations No evidence of Otter holts was observed within the near vicinity of the project location. However, given works are unlikely to commence until summer 2022, there remains the potential for the establishment of new holts (within the zone of disturbance of the project) prior to project commencement. This has the potential to lead to disturbance of local otter populations through noise and vibration created by the proposed works. As such, where mitigation measures are not applied, the proposed works have the potential to result in likely significant indirect effects on these habitats and species of qualifying interest of Lough Swilly SAC and the species special conservation interest and their habitats of both Lough Swilly SPA. **Conclusion:** ***Potential for likely significant effects***

5.6 Screening Statement and Conclusions

The scoping assessment detailed in Section 4.2.1 examined potential effects on the EU sites within the Zone of Influence of the proposed application area. The following two designated sites were scoped as part of this evaluation:

- Lough Swilly SAC (Site Code: 002287)
- Lough Swilly SPA (Site Code: 004075)

Following consideration of the nature and scale of the project, the hydrological/ecological connectivity between the proposed project location and the designated sites, the site specifics of the proposed application area location and the qualifying interests of the EU site, likely significant effects on the qualifying interests of the **two identified EU sites** were evaluated in Section 5.3 of this screening report.

As a result of the screening process, it has been determined that, **where mitigation measures are not applied, potentially significant direct and indirect effects on the habitats and species listed in Table 5.2 remain as a result of the following:**

- A reduction in water quality due to the potential release of hydrocarbons into the local watercourse as a result of the proposed works which could directly and indirectly affect aquatic species and their habitats;
- Noise arising from construction activity has the potential to disturb otter activity in the local area.

The recommendation of the screening process is therefore to proceed to Stage 2 Appropriate Assessment with regard to the potential for significant indirect effects on Lough Swilly SAC and Lough Swilly SPA.

6 STAGE 2 – APPROPRIATE ASSESSMENT REPORT

This section of the Natura Impact Statement addresses the possibility of there being a significant effect or effects on the following European sites which was identified during Stage One screening (Section 5):

- Lough Swilly SAC (Site Code: 002287)
- Lough Swilly SPA (Site Code: 004075)

6.1 Assessment of the Effects of the Project or Plan on the Integrity of the Sites

'Describe the elements of the project or plan (alone or in combination with other projects or plans) that are likely to give rise to significant effects on the site (from screening assessment)'

The proposed project has the potential to cause a reduction in water quality within Lough Swilly SAC and SPA, and by consequence, the potential for significant effects on aquatic habitats and species of qualifying and special conservation interest exists.

6.2 The Conservation Objectives of the Natura 2000 Sites

'Set out the conservation objectives of the site'.

The conservation objectives of the European site concerned are to maintain the favourable conservation status of the key species and habitats for which the site has been designated. These are laid out in Table 6-1 below.

Table 6.1: Key species of qualifying interest of the EU sites potentially affected by the proposed works in relation to their conservation objectives.

Designated Sites	Conservation Objectives and QIs Affected
Lough Swilly SAC and SPA	Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and the Annex I and II species for which the SAC and SPA have been selected: • Estuaries • Atlantic Salt Meadows • Otter • Bird species of special conservation interest listed in Table 4.3 and their habitats. *NPWS (2011) Conservation Objectives: Lough Swilly SAC 002287/Lough Swilly SPA 004075. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, and the Gaeltacht. [Accessed online on 21/04/2022]*

6.3 Potential Effects on Key Species and Key Habitats

'Describe how the project or plan will affect key species and key habitats. Acknowledge uncertainties and any gaps in information'.

6.3.1 A Reduction in Water Quality due to the Release of Hydrocarbons

A reduction in water quality due to the accidental release hydrocarbons has the potential result in significant indirect effects on the ecologically sensitive intertidal habitats within Lough Swilly and the species which use them.

In addition, otters may be secondarily affected by a deterioration in water quality through a reduction in potential prey should fish be impacted upon as a result of hydrocarbon runoff to surface water.

6.3.2 Disturbance of Otter

Increases in human activity causing disturbance, including noise, vibration and visual disturbance, can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

The response of individual species to increased levels of human disturbance will depend upon a number of factors including the sensitivity, reproductive status, previous exposure to human disturbance, behaviour during the event, species tolerance to disturbance, location in relation to the source, availability of alternative nearby habitat, and environmental factors (i.e. topography, vegetation and atmospheric conditions which can influence noise levels).

It is generally accepted that for noise and visual disturbance, certain species or groups of species, particularly in this case Otter, can be affected at a distance of up to 150m from its source for high level and discontinuous disturbance with these distances reducing for low level and/or continuous disturbance levels.

6.4 Potential Impacts on the Integrity of the Sites

'Describe how the integrity of the site (determined by structure and function and conservation objectives) is likely to be affected by the project and plan (e.g. loss of habitat, disturbance, disruption, chemical changes, hydrological changes and geological changes etc.). Acknowledge uncertainties and any gaps in information'.

The integrity of Lough Swilly SAC and SPA could be indirectly affected by the proposed works through a reduction in water quality and disturbance through noise leading to potentially significant effects on the qualifying and special conservation interests of the SAC and SPA as listed in Table 6-1. Table 6.2 presents specific effects detailing their importance, magnitude and level of significance.

Table 6.2: Potential effects as a result of the proposed development on the water dependant habitats and species of qualifying and special conservation interest of Lough Swilly SAC and SPA.

Activity	Features of interest affected	Character of potential impact	Potential consequential impact on features interest	Importance of features of interest	Magnitude of potential impact	Term	Significance of potential impact
Storage of hydrocarbons; leakages from machinery; spillages during refuelling.	Estuaries; Atlantic Salt Meadows; Otter; Bird species of special conservation interest listed in Table 4.3 and their habitats.	Hydrocarbons have the potential to leak into the watercourse resulting a deterioration in water quality of Lough Swilly SAC and SPA.	In the scenario of a release of hydrocarbons from vehicles, machinery and stored fuels during the proposed construction works along drainage channel D1, there is potential for significant indirect effects on the SAC/SPA species and the fish prey species of otter.	High	Medium	Temporary	Moderate

Activity	Features of interest affected	Character of potential impact	Potential consequential impact on features interest	Importance of features of interest	Magnitude of potential impact	Term	Significance of potential impact
Noise and vibrations from the proposed construction activities.	Otter	Disturbance and/or displacement of breeding or foraging otter.	Noise and vibrations from the proposed construction activities have the potential to result in disturbance and displacement of otters, if any otter holts are created in the near vicinity before project commencement.	High	Medium	Temporary	Moderate

6.5 Mitigation Measures to be Introduced

'Describe what mitigation measures are to be introduced to avoid or reduce the adverse effects on the integrity of the site. Acknowledge uncertainties and any gaps in information'

- *List measures to be introduced*
- *Explain how the measures will avoid the adverse effects on the integrity of the site*
- *Explain how the measures will reduce the adverse effects on the integrity of the site*
- *Provide evidence of how they will be implemented and by whom.*

The following mitigation measures presented will be implemented in order to reduce or avoid adverse effects on Lough Swilly SAC and Lough Swilly SPA.

- The OPW will appoint an Environmental Officer from a member of their own ground staff or technical staff to oversee the appropriate implementation of the following mitigation measures.
- The OPW Environmental Guidance (Brew and Gilligan, 2019) will be strictly adhered to during these works.

6.5.1 Protection Against the Deterioration in Water Quality as a Result of Hydrocarbon Release

The following mitigation measures shall be strictly adhered to in relation to the storage and use of hydrocarbons during the proposed works:

- No fuel will be stored near the watercourse.
- All refuelling of plant will take place at an allocated location on the site at a distance greater than 50m from the watercourse (Refer to OWP EP17 Water Pollution 4a).
- Fuel nappy to have 110 % capacity. This will allow for sufficient reaction time to a potential fuel spill before any fuel enters the watercourse.
- A spill kit will always be present on sites where there is interaction with an open watercourse.
- Hydraulic fluid leaks will be addressed, using the spill kit that will be present on the site as soon as they are identified.
- The plant in question will immediately be moved to a safe area where leakage of fluid into the watercourse is not possible.

6.5.2 Protection Against Disturbance or Displacement of Otter

The following mitigation measures shall be strictly adhered to in relation to noise and vibrations from the proposed tree management activities:

- Otter surveys should be undertaken immediately prior to the commencement of any works in order to identify any changes in otter activity since the original NIS baseline survey.
- It is also important to ensure that no new otter holts have been created in the intervening period.
- No works should be undertaken within 150m of any holts at which breeding females or cubs are present.
- Following consultation with NPWS, works closer to such breeding holts may take place.
- No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts.
- Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence.
- The prohibited working area associated with otter holts should, where appropriate, be fenced with temporary fencing prior to any possibly invasive works.
- Appropriate awareness of the purpose of the enclosure should be conveyed through notification to site staff and sufficient signage should be placed on each exclusion fence.
- All contractors or operators on site should be made fully aware of the procedures pertaining to each affected holt.
- Where holts are present in close proximity to invasive construction works but are determined not to require destruction, construction works may commence once recommended alternative mitigation measures to address otters have been complied with.

6.6 Residual Effects

Following the appropriate implementation of the mitigation measures outlined above, residual effects of the proposed works on the integrity of Lough Swilly SAC and Lough Swilly SPA will be imperceptible.

6.7 Efficacy of the proposed Mitigation Measures

Provide evidence of the degree of confidence in the likely success of the mitigation measures.

Mitigation measures were devised in consideration of the following guidelines:

- Water Framework Directive (2000/60/EC)
- UK Pollution Prevention Guidelines (PPG):
    - PPG1: Good Environmental Practices (2013)
    - PPG2: Above ground oil storage tanks (2011)
    - PPG3: Use and design of oil separators in surface water drainage systems (2006)
    - PPG4: The disposal of sewage where no foul sewer is available (2006)
    - PPG5: Works and maintenance in or near water (2007)

  - PPG7: The safe operation of refuelling facilities (2011)
  - PPG8: Safe storage and disposal of used oil (2004)
  - PPG21: Incident response planning (2009)
  - PPG22: Dealing with Spills (2011)
  - PPG26: Drums and Intermediate Bulk Containers (2011)

- CIRIA (2006). Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532.
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works In and Adjacent to Waters.
- Inland Fisheries Ireland (2010). IFI Biosecurity Protocol for Field Survey Work
- National Roads Authority (2005). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- National Roads Authority (2008). Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.
- OPW (2019) Environmental Guidance: Drainage Maintenance and Construction.

Accordingly, given the provenance of the mitigation measures as set out above, those mitigation measures (when correctly implemented) will be successful in ensuring that the European site is preserved at a favourable conservation status by ensuring the lasting preservation of the constitutive characteristics of this site.

In circumstances where the mitigation measures have been developed in the light of the best scientific knowledge, no reasonable scientific doubt remains to the *absence* of any adverse effects caused by the proposed development on the integrity of the European sites under consideration in circumstances where those mitigation measures are implemented.

6.8 Conclusion

In summary, it can be concluded that in light of the conservation objectives and rationale for designation of Lough Swilly SAC and Lough Swilly SPA, the potential for significant indirect effects exists as a result of aspects of the proposed replacement of an existing pipe culvert bridge structure (B5) along a drainage channel (D1) within Swilly Big Isle Arterial Drainage Scheme, Co. Donegal.

These potentially significant effects have been evaluated and with the implementation of the proposed mitigation measures, it is concluded that the proposed project will not result in any effects that will adversely affect Lough Swilly SAC and Lough Swilly SPA, having regard to the sites' conservation objectives, in circumstances where "no reasonable scientific doubt" remains as to the absence of such adverse effects.

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8 APPENDICES

APPENDIX I – OPW PLANNING DRAWINGS

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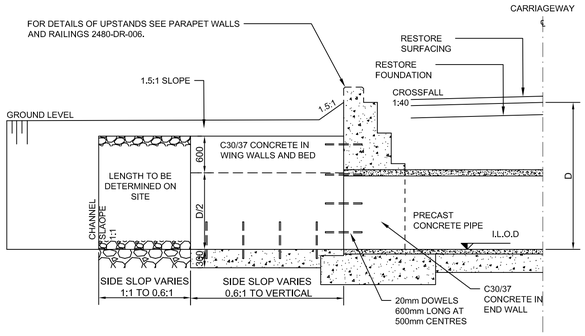
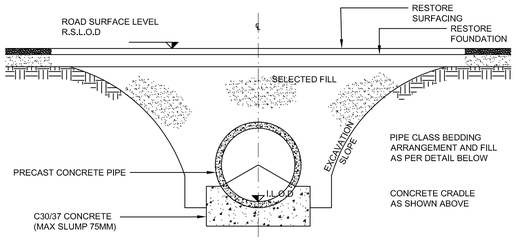


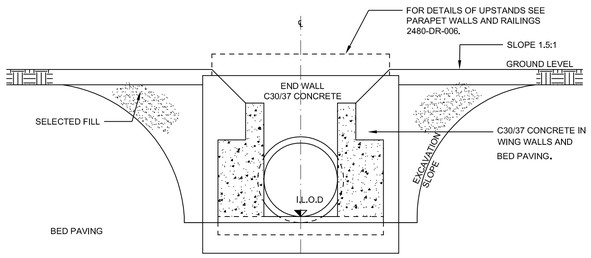
HALF LONGITUDINAL SECTION OF CENTRE LINE OF CULVERT

SHOWING ELEVATION OF WING WALLS

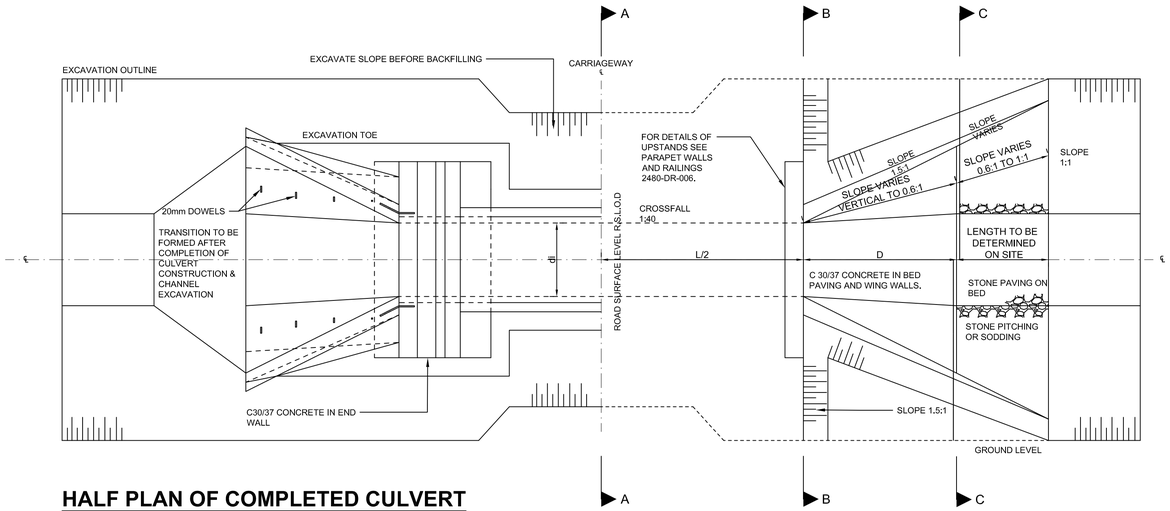
FOR DETAILS OF END WALL SECTIONS AND FOR "D" VALUES UP TO 3.0M SEE TYPICAL SECTIONS OF END WALL.



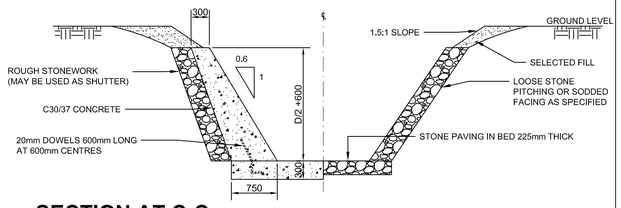
SECTION AT A-A



SECTION AT B-B



HALF PLAN OF COMPLETED CULVERT



SECTION AT C-C

NOTES:
Figured dimensions only to be taken from this drawing, do not scale.

THE PIPE CULVERT DESIGNS SHOWN ARE, WITH SPECIFIED VARIATIONS, APPLICABLE TO PUBLIC, PRIVATE AND FIELD ACCOMMODATION ROADS, EXCLUDING PUBLIC ROADS MORE THAN 2 LANES.

PARAPETS WHERE REQUIRED SHOULD BE SELECTED FROM THOSE SHOWN ON DRAWING 2480-DR-006 AND CONSTRUCTED IN ACCORDANCE WITH THE DETAILS SHOWN.

MINIMUM COVER DEPTHS (CROWN OF PIPE TO ROAD SURFACE LEVELS)
PUBLIC ROADS - 0.9M
PRIVATE AND FIELD ACCOMMODATION BRIDGES - 0.6M

VARIATIONS IN DIMENSIONS
THE VALUES OF THE VARIABLE BASIC DIMENSIONS INDICATED BY LETTER ON THE DRAWING SHALL AFFECT THE CULVERT DETAILS AS FOLLOWS:

LENGTH
THE LENGTH OF THE CULVERT ALONG CHANNEL IS NOT SUBJECT TO LIMITATION AND THE STRUCTURE AND WING WALL ARRANGEMENT CAN BE ADOPTED IRRESPECTIVE OF LENGTH.

DEPTH (D)
THIS IS DEFINED AS THE HEIGHT BETWEEN THE PIPE INVERT LEVEL AND THE CARRIAGEWAY SURFACE AND THE DESIGNS ARE APPLICABLE TO VALUES OF D UP TO A MAXIMUM OF 3 METRES. IT IS CONSIDERED GOOD PRACTICE TO SET THE PIPE INVERT AT LEAST 75MM BELOW THE CHANNEL INVERT AND THE SELECTED D VALUE SHOULD TAKE SUCH ADJUSTMENTS INTO ACCOUNT.

END WALL (SPANDREL) VARIABLE DIMENSIONS
THE SECTIONAL DIMENSIONS WILL VARY WITH D AS SHOWN ON THE DRAWING.
THE WIDTH W WILL VARY WITH D AS TABULATED BELOW

D	1.5m	2.0m	2.5m	3.0m
W	2.25m	2.75m	3.2m	3.7m

WING WALL VARIABLE DIMENSIONS
LENGTH AND HEIGHT SHALL BE RELATED TO D AS SHOWN ON THE DRAWING. THE TRANSITION LENGTH UPSTREAM AND DOWNSTREAM OF WING WALLS AND/OR THE NEED FOR CUT-OFF WALLS SHALL BE DETERMINED ON SITE.

PIPE BEDDING VARIABLE DIMENSIONS
WIDTHS AND THICKNESSES ARE RELATED TO do (PIPE BARREL DIAMETER) AND di (PIPE INTERNAL DIAMETER) AS SHOWN ON SECTIONAL DETAILS.

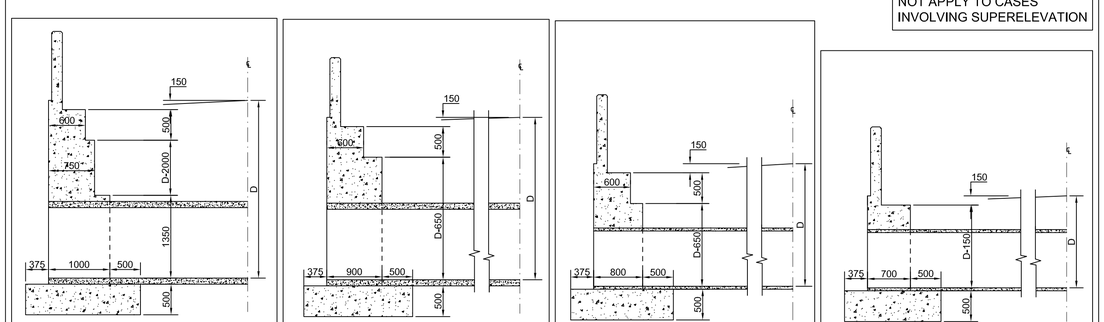
FOUNDATION PRESSURES
THE ARRANGEMENTS SHOWN FOR THE END WALL (SPANDREL) FOUNDATIONS SHOULD PRODUCE MAXIMUM FOUNDATION PRESSURES OF ABOUT 300KN PER SQUARE METRE AND ACCORDINGLY, CAN BE USED WITHOUT MODIFICATION WHERE SUBSTRATUM CONSISTS OF HARD CLAY OR COMPACTED SAND OR GRAVEL OR BETTER MATERIAL. FOR WEAKER BEARING CONDITIONS CONCRETE FOUNDATIONS UNDER PIPE SHOULD BE WIDENED TO do+100MM WITH A THICKNESS OF $\frac{1}{2}$(di+do) ON EACH SIDE AND HAVE BOTTOM REINFORCEMENT OF 12MM BARS AT 300MM CENTRES EACH WAY (MINIMUM COVER 60MM) EXTENDING INTO SPANDREL WALL FOUNDATIONS. THIS WILL CATER FOR SAFE BEARING PRESSURES DOWN TO 100KN PER SQUARE METRE.

CONSTRUCTION JOINTS
CAST CONCRETE SHOULD BE SCABBLED AND CLEANED TO EXPOSE COARSE AGGREGATE.

SUSTAINABILITY:
BRIDGE SHOULD BE CONSTRUCTED FROM CONCRETE MIX CONTAINING UP TO 50% GGBS WHERE AVAILABLE, PROVIDED MIX CAN MEET CONCRETE SPECIFICATION ON THIS DRAWING.

TYPICAL SECTION THROUGH END WALL FOR "D" RANGE UP TO 3.0m

NOTE: - THESE SECTIONS DO NOT APPLY TO CASES INVOLVING SUPERELEVATION



END WALL SECTION FOR D = 2.5m to 3m

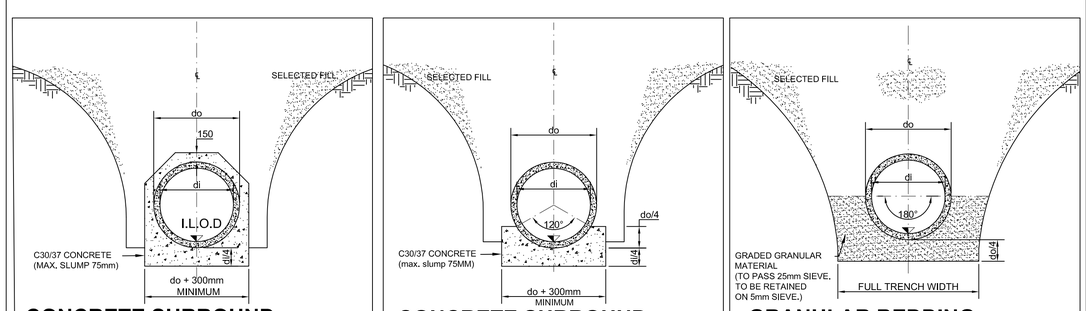
END WALL SECTION FOR D = 2m to 2.5m

END WALL SECTION FOR D = 1.5m to 2m

END WALL SECTION FOR D = < 2m

ALTERNATIVE BEDDING ARRANGEMENTS

NOTE: - do = PIPE BARREL DIAMETER
di = PIPE INTERNAL DIAMETER



CONCRETE SURROUND FOR USE WITH CLASS "N" PIPES

CONCRETE SURROUND FOR USE WITH CLASS "L & M" PIPES

GRANULAR BEDDING FOR USE WITH CLASS "L & M" PIPES

Rev	Date	Checked	Description
P2	11/09/15	TMcD	DRAWING UPDATED
P1	25/09/14	TMcD	NOTES UPDATED
P0	09/04/13	TMcD	PREPARED FOR COMMENT

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PROJECT
TYPICAL SMALL SPAN BRIDGE CONSTRUCTION

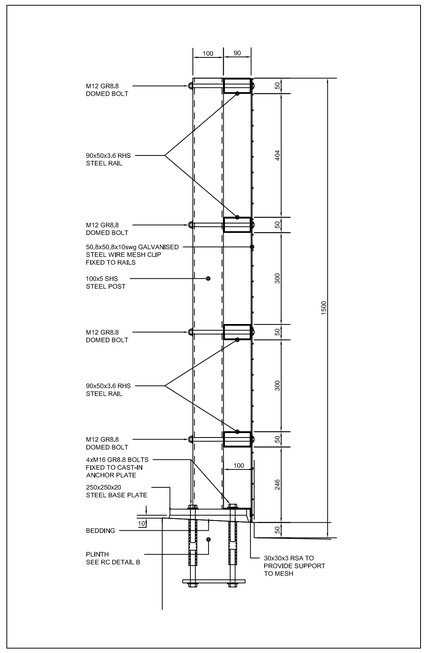
DRAWING
TYPICAL CONCRETE PIPE CULVERT CONSTRUCTION

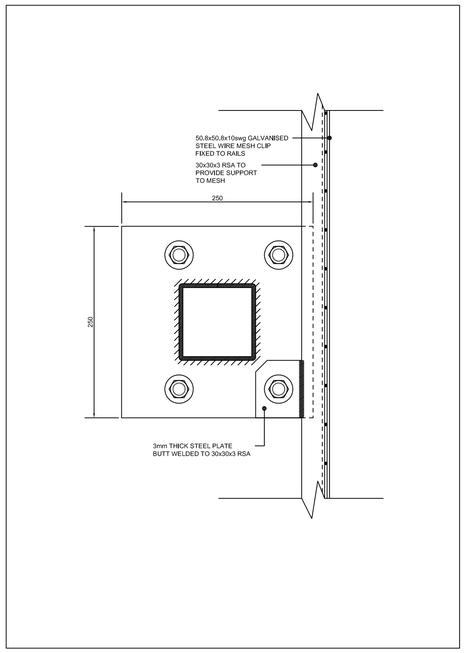
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Scales:	1:50
Date:	11/09/2015
Drawn:	JGill
Checked:	RW
Approved:	KW
Purpose of Issue:	By
PRELIMINARY DESIGN	Civil & Structural Engineering Services
CONSTRUCTION	
Drawing No:	2480-DR-003-P2

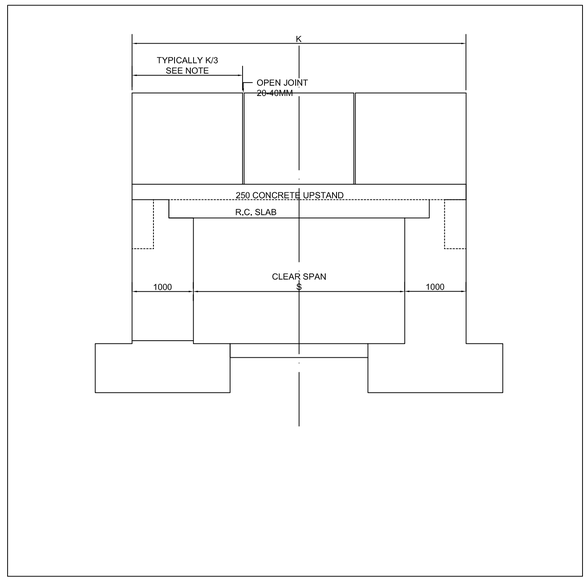
A1

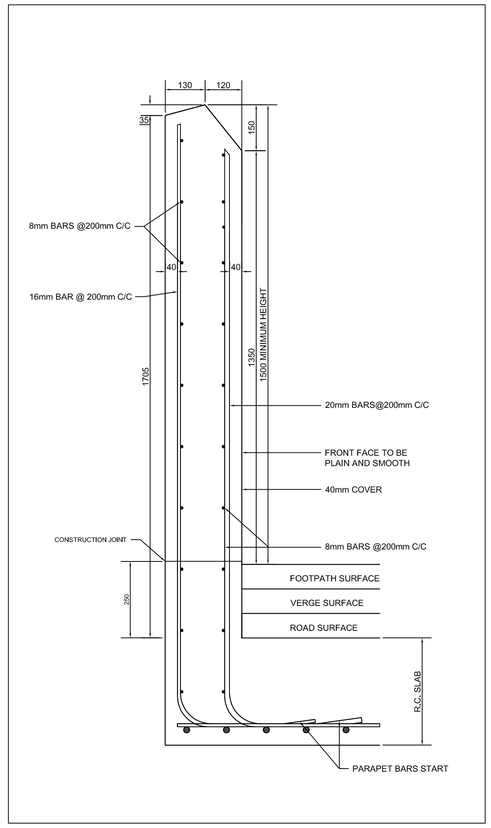
N1 TYPE PEDESTRIAN/VEHICLE STEEL PARAPET





N1 TYPE PEDESTRIAN/VEHICLE CONCRETE PARAPET





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NOTES:

FOR SETTING OUT, SEE INDIVIDUAL PROJECT DRAWINGS.
FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING, DO NOT SCALE.

1. GENERAL
THIS DRAWING GIVES DETAILS OF PARAPET CONSTRUCTION. THE DESIGNS ARE BASED ON THE NRA PUBLICATION: DESIGN MANUAL FOR ROADS AND BRIDGES NRA BD 52/13 VEHICLE AND PEDESTRIAN PARAPETS. DESIGNS SHOWN ON THIS DRAWING ARE TO PROVIDE N1 AND N2 LEVELS OF CONTAINMENT RESPECTIVELY FOR VEHICLE BRIDGES. ADDITIONAL DESIGNS FOR PEDESTRIAN ONLY BRIDGES ARE ALSO GIVEN.

2. THE BRIDGE PARAPETS ON THIS DRAWING ARE NOT SUITABLE FOR BRIDGES OVER RAILWAYS.

IN ORDINARY CIRCUMSTANCES, VEHICLE PARAPETS SHALL BE A PRODUCT THAT HAS BEEN FULLY CRASH TESTED IN ACCORDANCE WITH IS EN 1317-2 AND MEET THE ACCEPTANCE CRITERIA OF IS EN 1317-2 FOR THE PERFORMANCE REQUIREMENTS SPECIFIED BELOW. IN OTHER CIRCUMSTANCES THE DESIGNED PARAPETS ON THIS DRAWING MAY BE USED.

2. TYPES OF CONSTRUCTION
N1: REINFORCED CONCRETE
N4: STRUCTURAL STEEL OR MASS CONCRETE

STRUCTURAL STEEL DESIGNS FOR N1 PARAPETS SHOULD BE SUBJECT TO AN INDIVIDUAL DESIGN

3. MINIMUM HEIGHT
THE FINISHED PARAPET MUST BE AT LEAST; 1.25M ABOVE THE FINISHED SURFACE OR FOOTPATH FOR VEHICLE AND PEDESTRIAN BRIDGES, 1.4M ABOVE FOR CYCLEWAYS, 1.5M ABOVE FOR ACCOMMODATION BRIDGES AND 1.85M ABOVE FOR BRIDLEWAY BRIDGES

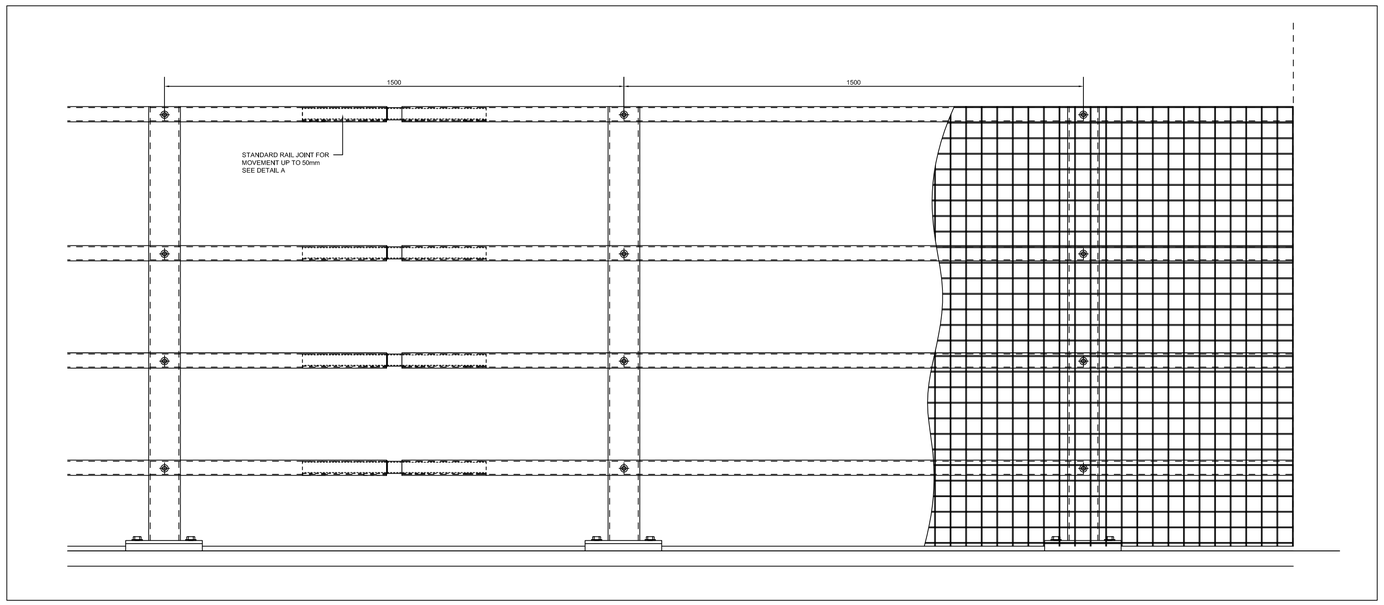
4. APPROACH FENCING
THE NEED OR OTHERWISE FOR SAFETY FENCING SHOULD BE THE SUBJECT OF CONSULTATION WITH THE RELEVANT LOCAL AUTHORITY

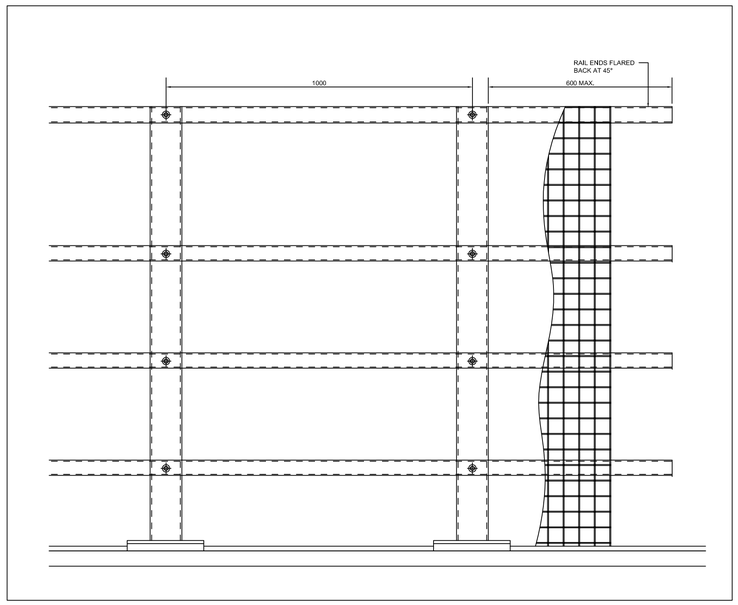
5. MATERIALS AND WORKMANSHIP SPECIFICATION
BRIDGES, PARAPETS, ABUTMENTS AND ASSOCIATED STRUCTURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ACCOMPANYING SPECIFICATION

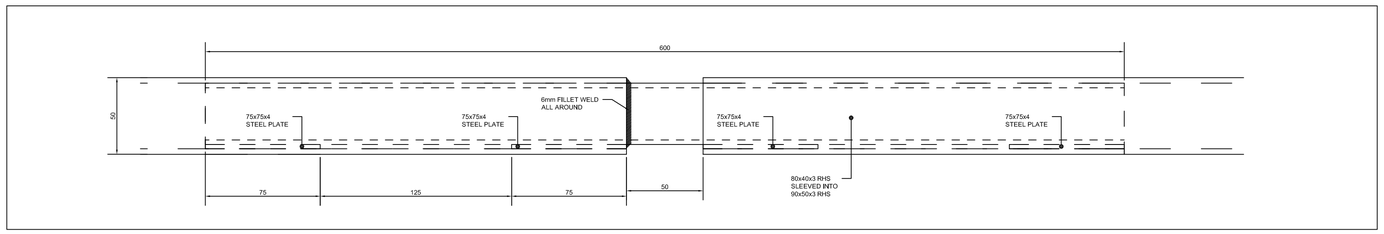
6. SUSTAINABILITY
BRIDGE SHOULD BE CONSTRUCTED FROM CONCRETE MIX CONTAINING UP TO 50% GGBS WHERE AVAILABLE, PROVIDED MIX CAN MEET CONCRETE SPECIFICATION ON THIS DRAWING.

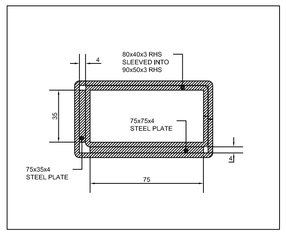
MINIMUM PARAPET CONTAINMENT LEVELS FOR VEHICLES

LOCATION	MINIMUM PARAPET CONTAINMENT LEVEL
All structures in urban areas where the legal speed limit is 60kph or less, except where: • The structure crosses or adjoins a motorway or railway, • The structure is on a horizontal curve and / or gradient and the radius and / or gradient does not comply with relevant desirable minimum standards (Relevant desirable minimum standards are described in NRA TD 9). All accommodation bridges serving a single landholding except accommodation bridges over the railway.	N1
All structures not otherwise explicitly dealt with in this table	N2
All structures carrying a motorway and crossing or adjoining another national route. All structures forming part of partially or fully free flow interchanges. All structures carrying a national or regional road where the geometric alignment does not comply with relevant desirable minimum standards within a distance of 215m of either approaches to the structure (Relevant desirable minimum standards are described in NRA TD 9).	H2
All structures crossing or adjoining a railway.	H2a









Rev	Date	Checked	Description
P1	25/09/14	TMcD	NOTES UPDATED
P0	09/04/13	TMcD	PREPARED FOR COMMENT

O.P.W Engineering Services
Civil & Structural Engineering Services
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E-mail engineering.services@opw.ie

PROJECT
TYPICAL SMALL SPAN BRIDGE CONSTRUCTION

DRAWING
PARAPET CONSTRUCTION
FOR USE IN CONJUNCTION WITH STANDARD BRIDGE AND CULVERT DESIGN

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Scales:	1:50
Date:	25/09/2014
Drawn:	JGill
Checked:	RW
Approved:	KW
Purpose of Issue:	*By*
PRELIMINARY DESIGN	Civil & Structural Engineering Services
CONSTRUCTION	
Drawing No:	2480-DR-006-P1

A1

APPENDIX II – NATURA 2000 SITE SYNOPSES AND CONSERVATION OBJECTIVES

SITE SYNOPSIS

Site Name: Lough Swilly SAC

Site Code: 002287

This large site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly. It extends from below Letterkenny to just north of Buncrana. Lough Swilly is a long sea lough, cutting through a variety of metamorphic rocks on the west side of Inishowen. The main rivers flowing into the site are the Swilly, Lennan and Crana. At low tide, extensive sand and mudflats are exposed, especially at the mouths of the Swilly and Lennan rivers. The site is estuarine in character, with shallow water and intertidal sand and mudflats being the dominant habitats.

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
[1150] Coastal Lagoons*
[1330] Atlantic Salt Meadows
[6410] *Molinia* Meadows
[91A0] Old Oak Woodlands
[1355] Otter (*Lutra lutra*)

Ecological communities present in the intertidal sediments at Lough Swilly SAC include fine sand community complexes, intertidal mixed sediment communities with polychaetes, subtidal mixed sediment communities with polychaetes and bivalves, muddy fine sand communities with *Thyasira flexuosa*, muddy community complexes and *Ostrea edulis* dominated communities. Bivalves and polychaete worms are well represented in the macro-invertebrate fauna, with species such as Cockles (*Cerastoderma edule*), Mussels (*Mytilus edulis*), Baltic Tellin (*Macoma balthica*), Ragworm (*Nereis diversicolor*) and Sand Mason (*Lanice conchilega*) being common. Common Cord-grass (*Spartina anglica*) is well established on parts of the intertidal flats. The shoreline above the flats varies from bedrock shore to shingle or cobbles, and here is found a scattering of salt tolerant plants such as Common Scurvygrass (*Cochlearia officinalis*), Sea-milkwort (*Glaux maritima*) and Red Fescue (*Festuca rubra*).

Saltmarshes are well represented in the inner sheltered areas of the site, with good examples in the Ramelton area. The marshes are the Atlantic salt meadow type, and are characterised by such species as Thrift (*Armeria maritima*), Sea-milkwort, Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*) and Red Fescue.

Lakes which are lagoonal in character occur at Inch and Blanket Nook. Inch Lough is a good example of a large, shallow lagoon with very low salinity in most of the lagoon. Less information is available for Blanket Nook but it is of a higher salinity and adds to the richness of the habitat within the site as a whole. The vegetation in Inch is diverse and typically lagoonal, with well-developed charophyte communities, including a large population of *Chara canescens* (a Red Data Book species). It also supports Horned Pondweed (*Zannichellia palustris*) and a mixed Pondweed/ Tassleweed community (*Potamogeton pectinatus*/*Ruppia maritima*). The green alga *Chaetomorpha linum* occurs at Blanket Nook. The aquatic fauna at Inch is rich and diverse and includes a range of lagoonal specialists and species that are apparently rare. These include *Lekanesphaera hookeri* (Order Isopoda), *Palaemonetes varians* (Order Decapoda), *Conopeum seurati* (a bryozoan), *Sigara stagnalis* (Order Hemiptera), *S. concinna* (Order Hemiptera), *Jaera nordmanni* (Order Isopoda), *Neomysis integer* (Order Mysida) and *Cordylophora caspia* (a hydrozoan). Less information is available on the aquatic fauna at Blanket Nook, though several lagoonal specialists have been recorded, including *Jaera ischiosetosa* (Order Isopoda), which appears to be a rare species in Ireland. Inch Lough is regarded as being of significant conservation value for ecotonal Coleoptera, with several species indicative of well-developed shoreline habitats including two that are apparently rare: *Bembidion bipunctatum*, a halo-tolerant shore species, and *Bembidion aeneum*, a stenotopic halobiont species. Although artificial in origin, the lagoon habitat in this site is one of the largest and best examples of a shallow, low salinity lagoon habitat in the country.

Over 11 hectares of *Molinia* Meadows, a habitat listed on Annex I of the E.U. Habitats Directive, are reported to occur at Inch Level, according to the Irish Semi-natural Grasslands Survey, 2010.

Two woodlands occur adjacent to the north-western shore of Lough Swilly. These are Rathmullen and Carradoan Woods, the former being a Nature Reserve. They are dominated by Sessile Oak (*Quercus petraea*) and Downy Birch (*Betula pubescens*), but many other species are present including exotics such as Beech (*Fagus sylvatica*). Alder (*Alnus glutinosa*) and willows (*Salix* spp.) occur in the wetter parts. An area of wet heath, dominated by Heather (*Calluna vulgaris*), occurs on the hill above Carradoran Wood. These woodlands display a generally intact structure and support a range of breeding birds, including Woodcock.

A further area of woodland, scrub and heath occurs above the north-east shore at Crockacashel and at Porthaw. Oak/Hazel (*Corylus avellana*) scrub is frequent, and there is a well-developed ground flora with species such as Wood-sorrel (*Oxalis acetosella*), Herb-Robert (*Geranium robertianum*), Lady-fern (*Athyrium filix-femina*) and Broad Buckler Fern (*Dryopteris dilatata*). The heath vegetation includes Heather, Gorse (*Ulex europaeus*), Wood Sage (*Teucrium scorodonia*) and Tormentil (*Potentilla erecta*). In the wetter areas, Purple Moor-grass (*Molinia caerulea*) and Cross-leaved Heath (*Erica tetralix*) occur.

The site supports a population of Otter, a species listed on Annex II of the E.U. Habitats Directive.

Lough Swilly is an important site for waterfowl in autumn and winter. The shallow waters provide suitable habitat for grebes and diving duck, while the intertidal flats are used by an excellent diversity of wildfowl and waders. At high tide, the duck and wader species roost on the saltmarshes and shorelines, with some species moving to the adjacent pasture and arable fields. In the three winters 1994/95 to 1996/97, 16 species occurred in nationally important numbers as follows (figures are average maximum counts for the 3 winters): Great Crested Grebe (274), Shelduck (646), Wigeon (1,673), Teal (1,381), Mallard (1,155), Shoveler (58), Scaup (143), Goldeneye (169), Red-breasted Merganser (103), Coot (335), Oystercatcher (1,459), Knot (327), Dunlin (7,995), Curlew (1,716), Redshank (1,080) and Greenshank (30). Other species which occur in regionally or locally important numbers, and at times may exceed the threshold for national importance, include Brent Goose, Pochard, Tufted Duck, Lapwing, Ringed Plover, Grey Plover, Bar-tailed Godwit and Turnstone. The site is also an important area for the Great Northern Diver and the rare Slavonian Grebe.

The adjacent pasture and arable polders at Inch, Big Isle and Blanket Nook support internationally important populations of Whooper Swans, Greenland White-fronted Goose and Greylag Goose. Inch Lough is an important roosting area for these birds and at times they utilise other parts of Lough Swilly for roosting.

This site is of conservation importance as it contains good examples of at least five habitats listed on Annex I of the E.U. Habitats Directive (estuaries, lagoons, Atlantic salt meadows, *Molinia* meadows, old oak woods) and supports a population of Otter. In addition, it is of high ornithological importance for wintering waterfowl, with 16 species occurring regularly in numbers of national importance, plus three species occurring within the site and on adjacent polders in numbers of international importance.

SITE SYNOPSIS

SITE NAME: LOUGH SWILLY SPA

SITE CODE: 004075

Lough Swilly is a long sea inlet cut through a variety of metamorphic rocks, situated on the west side of the Inishowen Peninsula in north Co. Donegal. The SPA comprises the inner part of Lough Swilly from just east of Letterkenny northwards to Killygarvan (*c*. 2 km north of Rathmullan) on the west side and to *c*. 2 km south of Buncrana on the east side; it includes the adjacent Inch Lough. Also forming part of the site is a series of improved pasture and arable fields on the south side of Lough Swilly between Farsetmore and Inch Levels – these are of importance to geese and swans. It includes sections of the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is a series of extensive sand and mud flats which are exposed at low tide - both estuaries and sand/mud flats are listed on Annex I of the E.U. Habitats Directive. Other habitats represented in the site are salt marshes, lagoons (at Inch Lough and Blanket Nook), rivers and streams, sand and shingle beaches, lowland wet and dry grasslands, drainage ditches, reedbeds and scrub. Inch Lough, whilst artificial in origin, is one of the largest and best examples of a shallow, low salinity lagoon in the country; it supports what is probably the largest population in the country of the Red-listed charophyte *Chara canescens*. A small sandy island, used by nesting terns, swans and gulls, occurs in the southern part of the lagoon.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Grey Heron, Whooper Swan, Greenland White-fronted Goose, Greylag Goose, Shelduck, Wigeon, Teal, Mallard, Shoveler, Scaup, Goldeneye, Red-breasted Merganser, Coot, Oystercatcher, Knot, Dunlin, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Sandwich Tern and Common 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 supports an excellent diversity of waterfowl species in autumn and winter as well as breeding terns, gulls and ducks. The shallow waters provide suitable habitat for grebes and diving duck, while the intertidal flats are used by an abundance of wildfowl and waders. At high tide, the duck and wader species roost on the salt marshes and shorelines, with some species moving to the adjacent pasture and arable fields. The combination within this site of extensive feeding areas and safe resting and roosting sites makes this one of the most important wetlands in the north-west of the country for wintering waterfowl.

Lough Swilly SPA supports internationally important numbers of Whooper Swan (1,673 - mean peak for the five winters 1995/96-1999/2000), Greenland White-

fronted Goose (847 for the Lough Swilly flock - mean peak for the five winters 1994/95-1998/99) and Greylag Goose (1,218 - mean peak for the five winters 1995/96-1999/2000). The main areas of the site used by these species are at Big Isle, Farsetmore, Blanket Nook, Ballylawn and Inch Levels. The flock sizes for Whooper Swan and Greylag Goose are the highest in the country. Considerably higher numbers of Whooper Swan (peak of 1,946) have been recorded, especially early in the season, as this is the area where the swans make their Irish landfall in autumn on their return from breeding grounds in Iceland. Both Greenland White-fronted Goose and Whooper Swan are listed on Annex I of the E.U. Birds Directive.

The site includes nationally important populations of 18 wintering waterbird species as follows (all figures are mean peaks for the five winters 1995/96-1999/00): Great Crested Grebe (284), Grey Heron (57), Shelduck (772), Wigeon (1,580), Teal (1,581), Mallard (1,169), Shoveler (60), Scaup (103), Goldeneye (170), Red-breasted Merganser (127), Coot (514), Oystercatcher (1,595), Knot (303), Dunlin (7,285), Curlew (1,720), Redshank (1,404), Greenshank (48) and Common Gull (1,523). Other species which occur include Light-bellied Brent Goose (152), Pochard (102), Golden Plover (749), Lapwing (1,408), Ringed Plover (81), Grey Plover (15), Bar-tailed Godwit (139) and Turnstone (73). The site is an important area for Great Northern Diver (19) and the rare Slavonian Grebe (11). The rare winter visitor, Pink-footed Goose, also occurs (15). Nationally important numbers of Mute Swan (265) also use the site.

The small island in Inch Lough supports the largest tern colony in the north-west, with nationally important populations of Sandwich Tern (258 pairs in 2001) and Common Tern (89 pairs in 2001) occurring. These two species are listed on Annex I of the E.U. Birds Directive. There is also a nationally important colony of Black-headed Gull (800 pairs in 2001), which represents one of the largest populations in the country.

Several species of duck breed on Inch Lough, most notably Tufted Duck, with an estimate of between 100 and 200 pairs occurring in 1997. Mute Swan breeds in important numbers and a concentration of 50 pairs on the small island in Inch Lough is most unusual as this species seldom nests in colonies. Whooper Swan, a very rare breeding species in Ireland, has been recorded nesting at Inch Lough. Lapwing breeds in regionally important numbers either on wet grass fields within the levels or around the edge of the lagoon. Coot also breed (estimate of 50 pairs in the 1990s).

Lough Swilly SPA is of major ornithological importance for wintering waterbirds, with three species occurring in numbers of international importance and 18 occurring regularly in numbers of national importance. The site is regularly used by more than 20,000 waterfowl and as such is of international importance. Additionally, it holds nationally important breeding populations of three species, i.e. Sandwich Tern, Common Tern and Black-headed Gull. The site is used by a good range of species that are listed on Annex I of the E.U. Birds Directive. Part of Lough Swilly SPA is a Wildfowl Sanctuary.

8.7.2014

National Parks and Wildlife Service

Conservation Objectives

Lough Swilly SAC 002287
Lough Swilly SPA 004075

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

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***

002287 Lough Swilly SAC

QI	Description
1130	Estuaries
1150	* Coastal lagoons
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1355	Otter *Lutra lutra*
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

004075 Lough Swilly SPA

QI	Description	
A005	Great Crested Grebe *Podiceps cristatus*	wintering
A028	Grey Heron *Ardea cinerea*	wintering
A038	Whooper Swan *Cygnus cygnus*	wintering
A043	Greylag Goose *Anser anser*	wintering
A048	Shelduck *Tadorna tadorna*	wintering
A050	Wigeon *Anas penelope*	wintering
A052	Teal *Anas crecca*	wintering
A053	Mallard *Anas platyrhynchos*	wintering
A056	Shoveler *Anas clypeata*	wintering
A062	Scaup *Aythya marila*	wintering
A067	Goldeneye *Bucephala clangula*	wintering
A069	Red-breasted Merganser *Mergus serrator*	wintering
A125	Coot *Fulica atra*	wintering
A130	Oystercatcher *Haematopus ostralegus*	wintering
A143	Knot *Calidris canutus*	wintering
A149	Dunlin *Calidris alpina*	wintering
A160	Curlew *Numenius arquata*	wintering
A162	Redshank *Tringa totanus*	wintering
A164	Greenshank *Tringa nebularia*	wintering
A179	Black-headed Gull *Chroicocephalus ridibundus*	breeding
A182	Common Gull *Larus canus*	wintering
A191	Sandwich Tern *Sterna sandvicensis*	breeding
A193	Common Tern *Sterna hirundo*	breeding
A395	Greenland White-fronted goose *Anser albifrons flavirostris*	wintering
A999	Wetlands & Waterbirds	

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

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

Title: Seabird Monitoring Programme (SMP) Database
Year: 2011
Author: JNCC
Series: http://jncc.defra.gov.uk/smp/Default.aspx

Title: Lough Swilly SAC (002287): Conservation objectives supporting document - coastal habitats [Version 1]
Year: 2011
Author: NPWS
Series: Unpublished Report to NPWS

Title: Lough Swilly SPA (004075): Conservation objectives supporting document [Version 1]
Year: 2011
Author: NPWS
Series: Unpublished Report to NPWS

Title: Lough Swilly SAC (002287): Conservation objectives supporting document - marine habitats [Version 1]
Year: 2011
Author: NPWS
Series: Unpublished Report to NPWS

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: Saltmarsh Monitoring Report 2007-2008
Year: 2009
Author: McCorry, M.; Ryle, T.
Series: Unpublished Report to NPWS

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: Saltmarsh Monitoring Report 2006
Year: 2007
Author: McCorry, M.
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: Inventory of Irish coastal lagoons
Year: 2007
Author: Oliver, G.
Series: Unpublished Report to NPWS

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

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

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: 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

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

Title: Otter survey of Ireland
Year: 1982
Author: Chapman, P.J.; Chapman, L.L.
Series: Unpublished Report to Vincent Wildlife Trust

Spatial data sources

Year:	2010
Title:	EPA transitional waterbody data
GIS operations:	Clipped to SAC boundary
Used for:	1130 (map 2)

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; Saltmarsh and Sand Dune datasets erased out
Used for:	Marine community types base data (map 3)

Year:	Interpolated 2011
Title:	Intertidal/subtidal surveys 2009, 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data
Used for:	Marine community types (map 3)

Year:	Revision 2011
Title:	Inventory of Irish Coastal Lagoons. Version 3
GIS operations:	Clipped to SAC boundary
Used for:	1150 (map 4)

Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QI selected; clipped to SAC boundary
Used for:	1330 (map 5)

Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary
Used for:	91A0 (map 6)

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; saltmarsh data for site combined to HWM and LWM polygon feature class; resulting polygon feature class unioned with SPA boundary; resulting polygon feature class clipped to SPA boundary; bird use zone attributes assigned to each polygon
Used for:	Bird use zones (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 landward side of the river banks data; creation of a 20m buffer applied to river centerline and stream data; combination of 10m river banks and 20m river and stream centerline buffer datasets; combined river and stream buffer dataset clipped to HWM; combination of HWM buffer dataset with river and stream buffer dataset; overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary
Used for:	1355 (no map)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in Lough Swilly 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 2	Habitat area was estimated at 6118ha using OSI data and the defined Transitional Water Body area under the Water Framework Directive. See marine habitats supporting document for further information
Community distribution	Hectares	The following communities should be conserved in a natural condition: Fine sand community complex; Intertidal mixed sediment with polychaetes; Subtidal mixed sediment with polychaetes and bivalves; Muddy fine sand with *Thyasira flexuosa*; Mud community complex and *Ostrea edulis* dominated community. See map 3	The communities were derived from the 2009 and 2010 intertidal survey and 2009 subtidal survey. See marine habitats supporting document for further information

1150 * Coastal lagoons

To restore the favourable conservation condition of Lagoons in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to slight natural variation. Favourable reference area 206ha- Inch Lough 176ha; Blanket Nook 30ha. See map 4	Areas calculated from spatial data derived from Oliver, 2007. Two lagoons are identified
Salinity regime	Practical salinity units (psu)	Maintain median annual salinity within natural ranges: Inch 0.1 - 3.0psu; Blanket Nook 10 - 20psu	Inch is one if the largest oligohaline (low salinity) lagoons in Ireland and most of the waterbody should have a salinity of 0.5 to 3.0 for most of the time but locally, fresh water may occur and at depth salinities of over 20 psu have been recorded. Blanket Nook is a mesohaline (medium salinity) lagoon. See Oliver (2007) for further information
Hydrological regime	Metres	Maintain current annual water level fluctuations and minima	Both lagoons are shallow- Inch only 2m and Blanket Nook 1m deep (Oliver, 2007). Small changes in summer levels would result in major losses of lagoonal area. Need to investigate normal fluctuations and set specific targets
Barrier	Sluice function	Maintain permeability, including appropriate management of sluices	Both lagoons are artificial with embankment barriers containing sluices. Need to identify main saline inputs and ensure that they, or equivalent, saline inputs are retained
Water quality: Chlorophyll a	µg/L	Reduce annual median chlorophyll a to less than 2.5µg/L at Inch; less than 5µg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Reduce annual median MRP to less than 0.01mg/L at Inch; less than 0.02mg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Reduce annual median DIN to less than 0.15mg/L at Inch; less than 0.4mg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Depth of macrophyte colonisation	Metres	Increase colonisation to maximum depth of both lagoons	Increased depth of colonisation increases both the extent and diversity of submergent macrophytes. This is especially important in Inch where, as well as being of major interest in their own right, the presence of a healthy submerged macrophyte sward is also important for the achievement of the SPA objectives
Typical plant species	Number and m^2	Maintain number and extent of listed lagoonal specialists, subject to natural variation	Species listed in Oliver (2007), especially *Chara canescens*, *Ruppia* spp. and *Zannichellia palustris* in Inch

1150 * Coastal lagoons

To restore the favourable conservation condition of Lagoons in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Typical invertebrate species	Number	Maintain listed lagoon specialists, subject to natural variation	Species listed in Oliver (2007), especially *Jaera ischiosetosa* (an isopod crutacean) in Blanket Nook
Negative indicator species	Number and % cover	Negative indicator species absent or under control	Because of eutrophication and the shallowness of both lagoons there is a danger that the cover of emergents and/or floating algal mats might increase at the expense of submerged macrophytes

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

To restore the favourable conservation condition of Atlantic salt meadows in Lough Swilly 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, including erosion and succession. For sub-sites mapped: Fahan - 7.29ha, Green Hill - 2.02ha, Lower Lough Swilly - 8.44ha, Rathmelton - 10.01ha, Ray - 0.05ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007; McCorry and Ryle, 2009). Five sub-sites were mapped and additional areas of potential saltmarsh were identified from an examination of aerial photographs, giving a total estimated area of Atlantic salt meadow of 38.98ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry (2007) and McCorry and Ryle (2009). Creek and pan structure is well developed at Rathmelton, but poorly developed or absent at all other sub-sites. Significant drainage has occurred at Green Hill. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from McCorry (2007) and McCorry and Ryle (2009). Most of the saltmarsh habitat in Lough Swilly is Atlantic salt meadow, although *Salicornia* mudflats have been recorded at Lower Lough Swilly and Rathmelton. Mediterranean salt meadow has also been recorded at Rathmelton. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry (2007) and McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

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

To restore the favourable conservation condition of Atlantic salt meadows in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with characteristic species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation composition: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on data from McCorry (2007) and McCorry and Ryle (2009). Significantly large stands of *Spartina* have been recorded at Rathmelton, Lower Lough Swilly and Green Hill. The evidence suggests that there has been recent spread of *Spartina* at Green Hill and parts of Rathmelton, while it may have been planted at Lower Lough Swilly. See coastal habitats supporting document for further details

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in Lough Swilly 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 north-west estimated at 65% (Bailey and Rochford, 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 95.7ha above high water mark (HWM); 44.0ha along river banks/ around pools	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 839.5ha	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 15.5km	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 83.7ha	No field survey. Lagoons have been included with other freshwater habitat as they are low/medium salinity. 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 and O'Neill, 2010) . It is important that such commuting routes are not obstructed

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

To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in Lough Swilly 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 58.68ha for sub-sites surveyed: Rathmullen wood - 26.00ha; Salt Pans wood - 13.47ha; Ballynarry wood - 15.61ha; Carrow Cashel wood - 3.60ha. See map 6	Area based on Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports. NB further unsurveyed areas maybe present within the site
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports. NB further unsurveyed areas maybe present within the site
Woodland size	Hectares	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) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types, including oak-ash; alder-ash in seepage areas and alongside streams; oak-birch; willow-alder-ash	Described in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
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

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

To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established (i.e. pre-1840s) woodlands, archaeological and geological features as well as red-listed and other rare or localised species. Perrin and Daly (2010) list Rathmullen wood, Salt pans wood and Ballynarry wood as 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) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
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 listed in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	Species reported in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports

A005 Great Crested Grebe *Podiceps cristatus*

To maintain the favourable conservation condition of Great Crested Grebe in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A038 Whooper Swan *Cygnus cygnus*

To maintain the favourable conservation condition of Whooper Swan in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A043 Greylag Goose *Anser anser*

To maintain the favourable conservation condition of Greylag Goose in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

To maintain the favourable conservation condition of Shelduck in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A053 Mallard *Anas platyrhynchos*

To maintain the favourable conservation condition of Mallard in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A062 Scaup *Aythya marila*

To maintain the favourable conservation condition of Scaup in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A067 Goldeneye *Bucephala clangula*

To maintain the favourable conservation condition of Goldeneye in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A125 Coot *Fulica atra*

To maintain the favourable conservation condition of Coot in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A143 Knot *Calidris canutus*

To maintain the favourable conservation condition of Knot in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A149 Dunlin *Calidris alpina*

To maintain the favourable conservation condition of Dunlin in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A164 Greenshank *Tringa nebularia*

To maintain the favourable conservation condition of Greenshank in Lough Swilly 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	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Lough Swilly 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 gull survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard gull survey methods (see Walsh et al., 1995).
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Lough Swilly 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	Population trend assessment using (Generalised Additive Modelling (GAM)) could not be undertaken for this species due to an incomplete dataset. A measure of population change was calculated using the 'generic threshold' method. See Section 4 of the SPA conservation objectives supporting document for more details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A191 Sandwich Tern *Sterna sandvicensis*

To maintain the favourable conservation condition of Sandwich Tern in Lough Swilly 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. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
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	The only known breeding site is on Inch Island

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in Lough Swilly 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. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
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	

A395 Greenland White-fronted goose *Anser albifrons flavirostris*

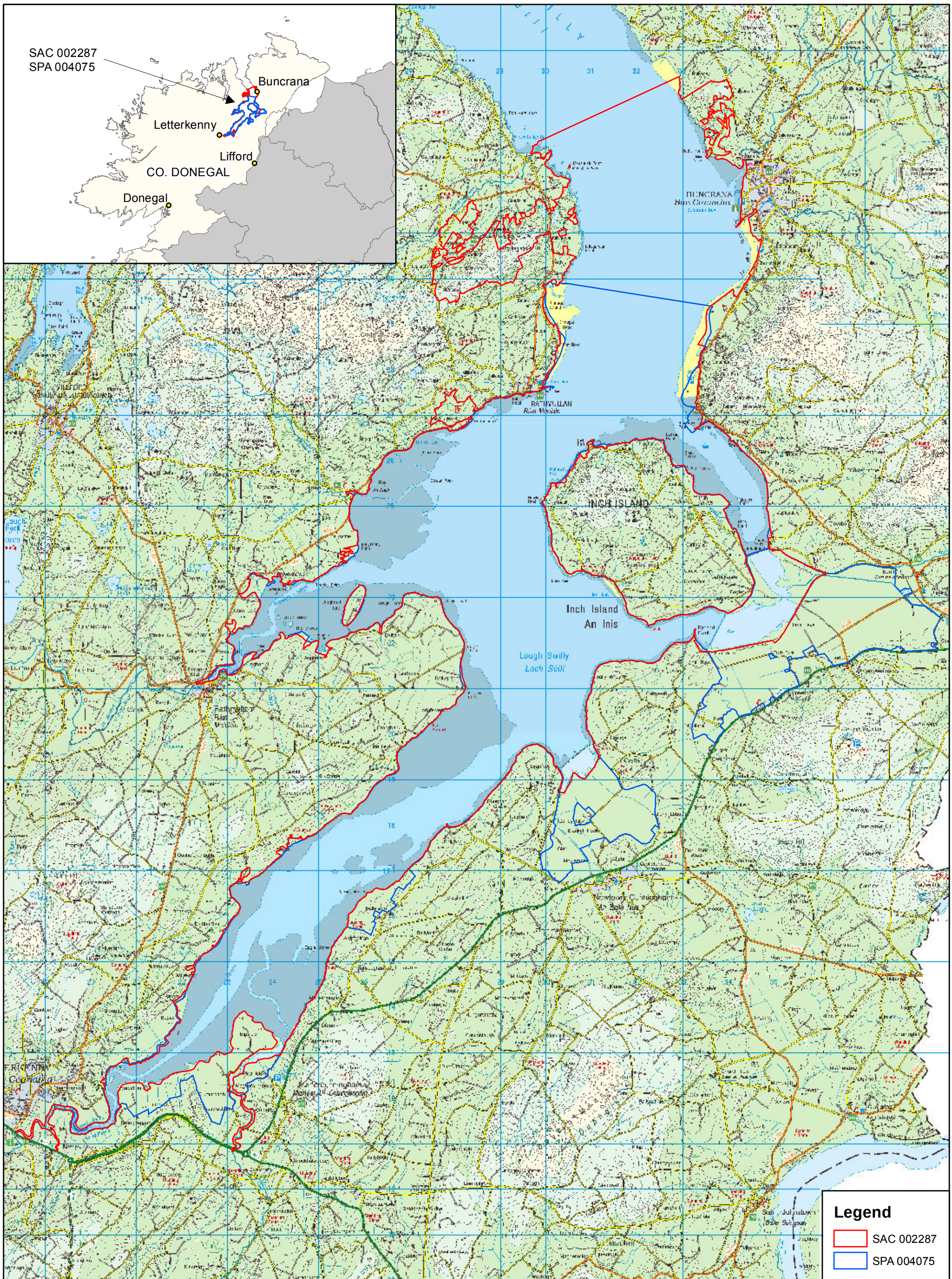
To maintain the favourable conservation condition of Greenland White-fronted Goose in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A999 Wetlands & Waterbirds

To maintain the favourable conservation condition of the wetland habitat in Lough Swilly SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat is stable and not significantly less than the areas of 4,162, 2,419, 201 and 317 hectares for subtidal, intertidal, supratidal and lagoon (and associated) habitats respectively, other than that occurring from natural patterns of variation. See map 7	Wetland areas defined as follows: subtidal- seaward extent of SPA boundary up to MLWM; intertidal- MLWM to MHWM; supratidal- MHWM to SPA boundary minus the area of terrestrial habitat; lagoon (and associated) habitats- lagoon extent and adjacent wetland habitat as defined by embankments



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MAP 1:
LOUGH SWILLY
CONSERVATION OBJECTIVES
SAC & SPA DESIGNATIONS

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

CO. DONEGAL

0 1 2 3 km

N

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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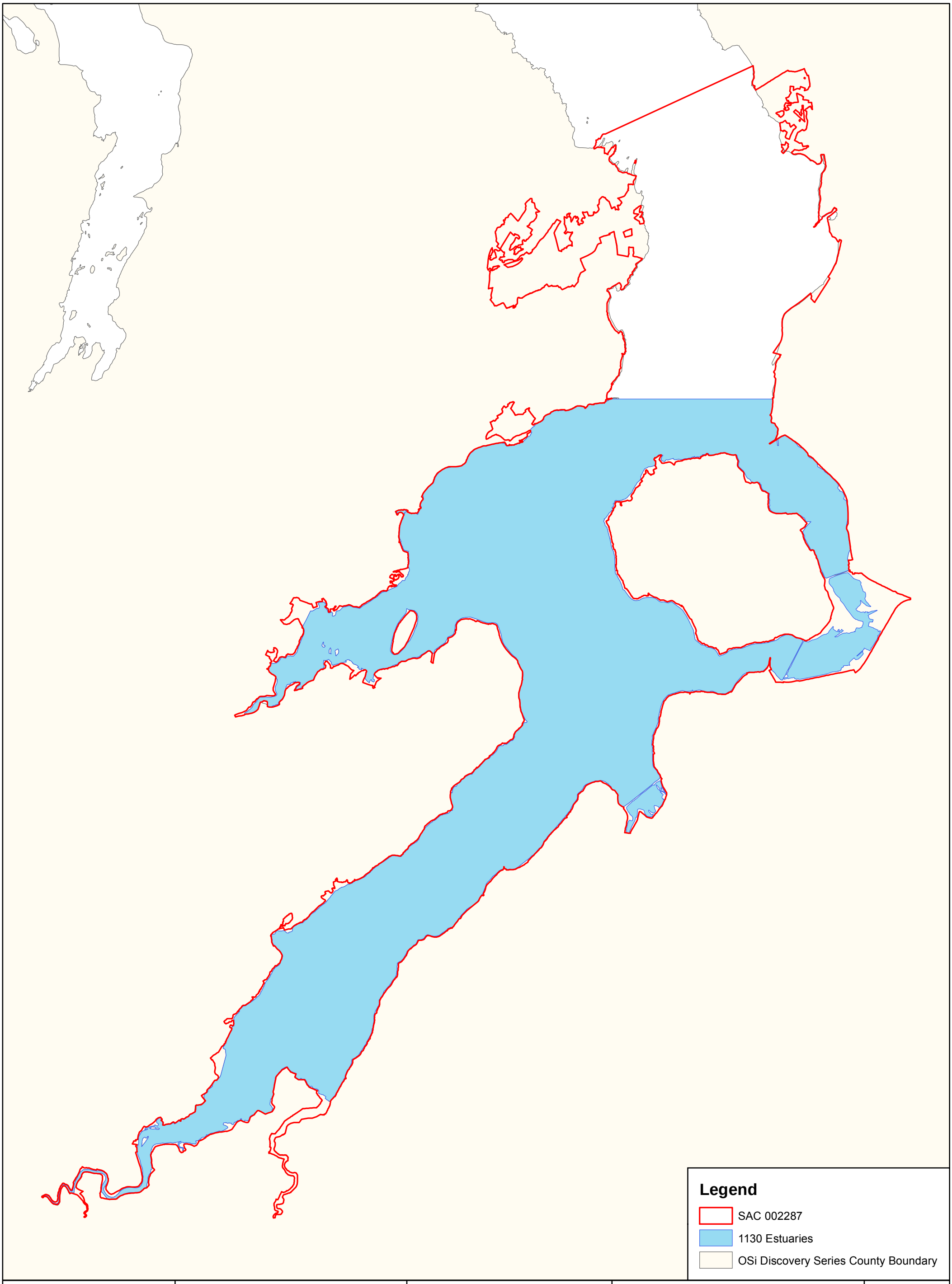
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE
SAC 002287
Version 1.01
SPA 004075
Version 1.04
Map Version 1
Date: March 2011



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MAP 2:
LOUGH SWILLY
CONSERVATION OBJECTIVES
ESTUARIES

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

CO. DONEGAL

0 1 2 3 km

N

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Boundaries of designated areas are subject to revision.
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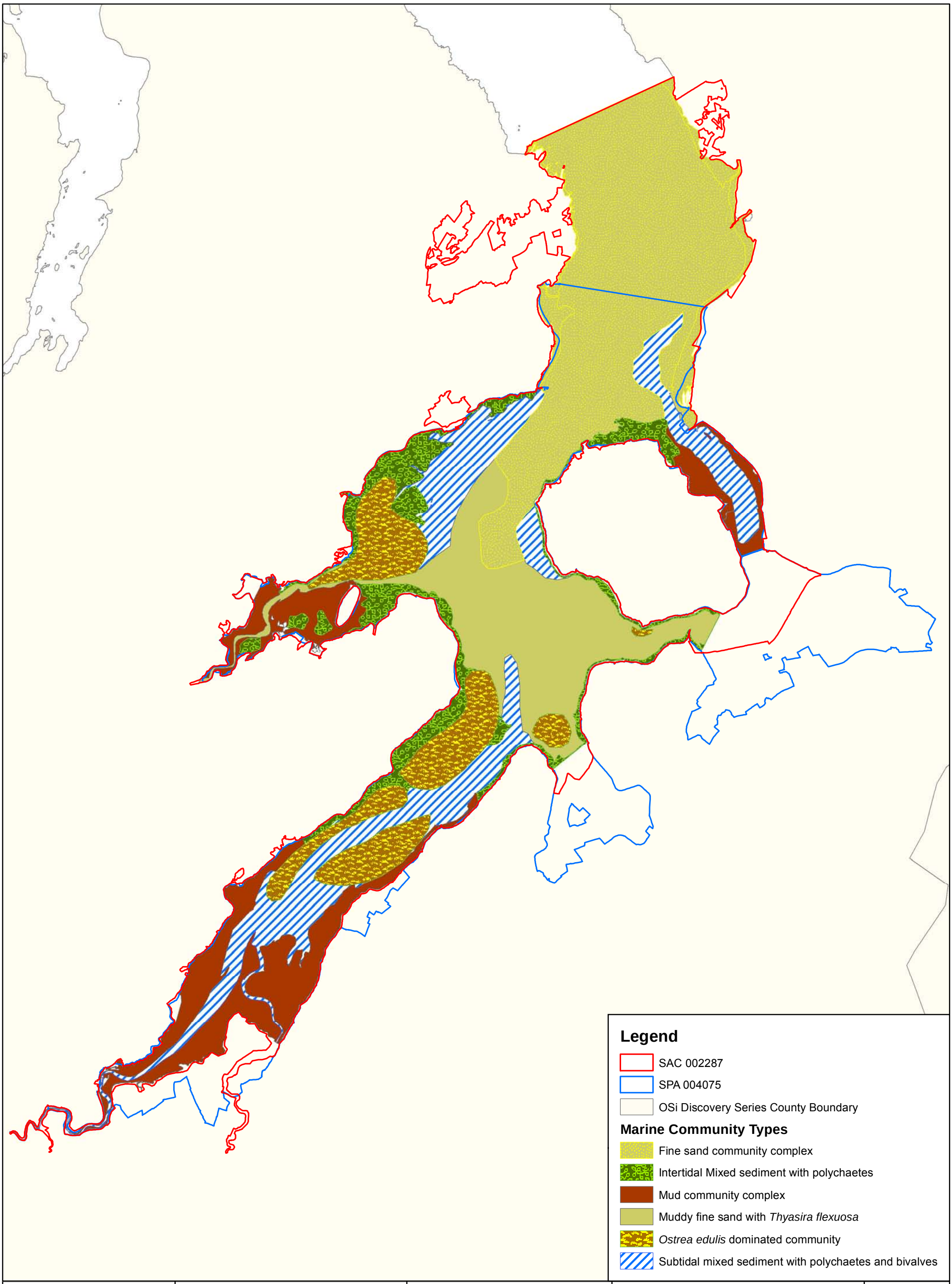
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



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MAP 3:
LOUGH SWILLY
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

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

CO. DONEGAL

0 1 2 3 km

N

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE
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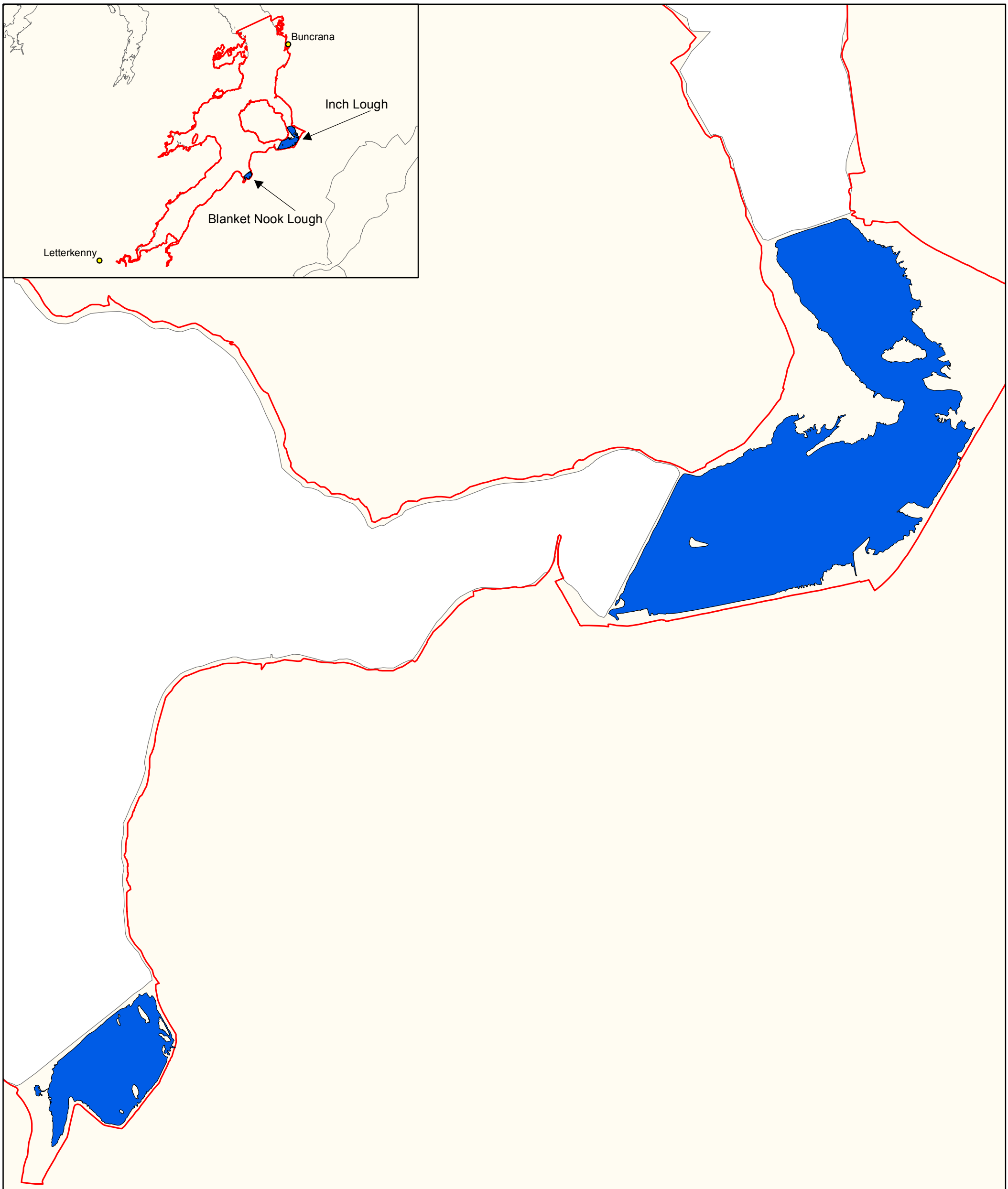
Version 1.01
SPA 004075
Version1.04
Map Version 1
Date: March 2011



Legend

- SAC 002287
- 1150 * Coastal Lagoons
- OSi Discovery Series County Boundary

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MAP 4:
LOUGH SWILLY
CONSERVATION OBJECTIVES
COASTAL LAGOONS

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

CO. DONEGAL

N

0 0.25 0.5 0.75 1 km

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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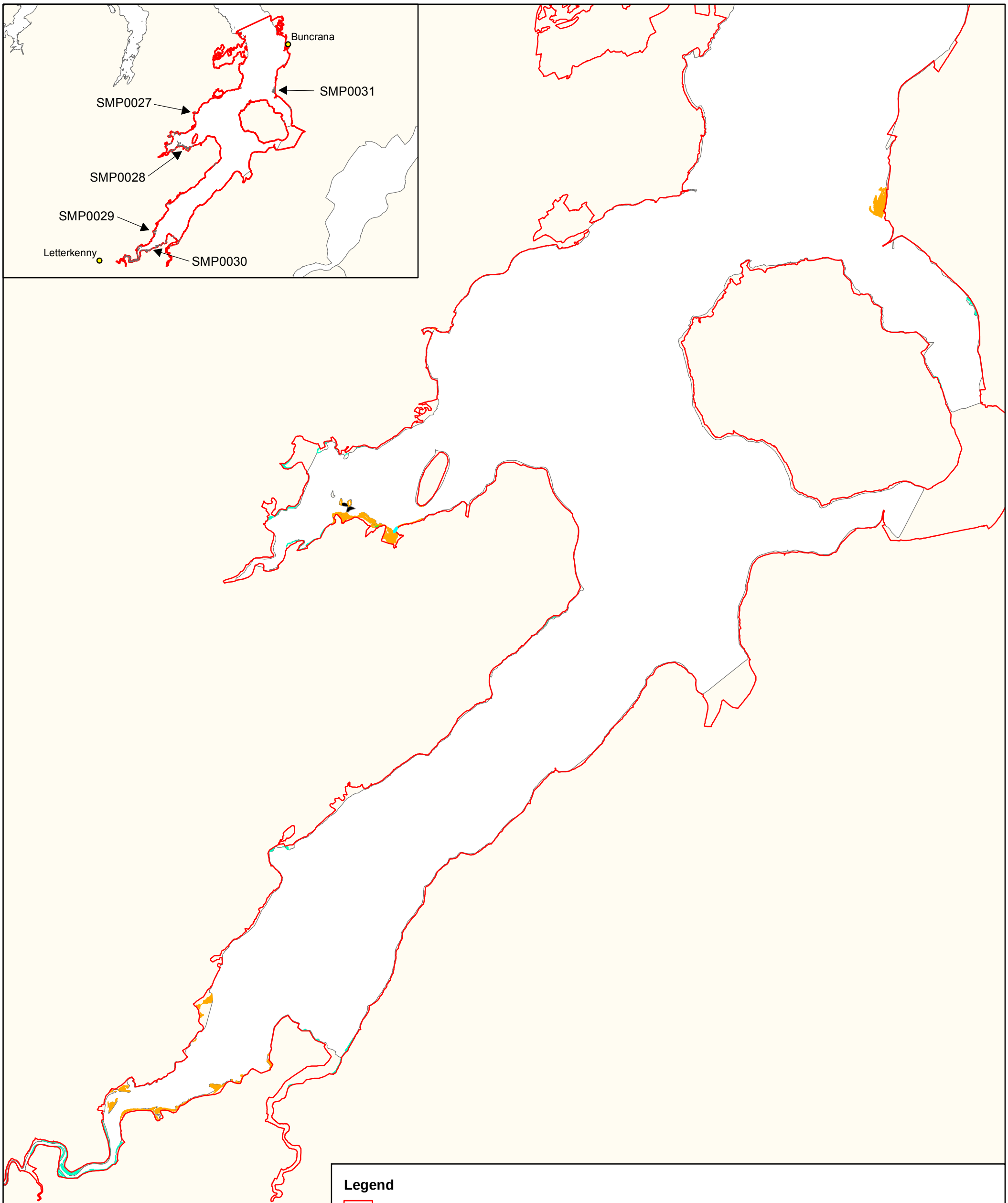
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



Legend

- SAC 002287
- OSi Discovery Series County Boundary

Saltmarsh Habitats

- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest
- 1330 / 1410 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest / Mediterranean salt meadows (Juncetalia maritimi)
- Potential 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest
- 1310 Salicornia and other annuals colonising mud and sand
- 1410 Mediterranean salt meadows (Juncetalia maritimi)

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MAP 5: LOUGH SWILLY CONSERVATION OBJECTIVES SALTMARSH HABITATS

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

CO. DONEGAL

0 0.5 1 1.5 2 km

N

The mapped boundaries are of an indicative and general nature only.
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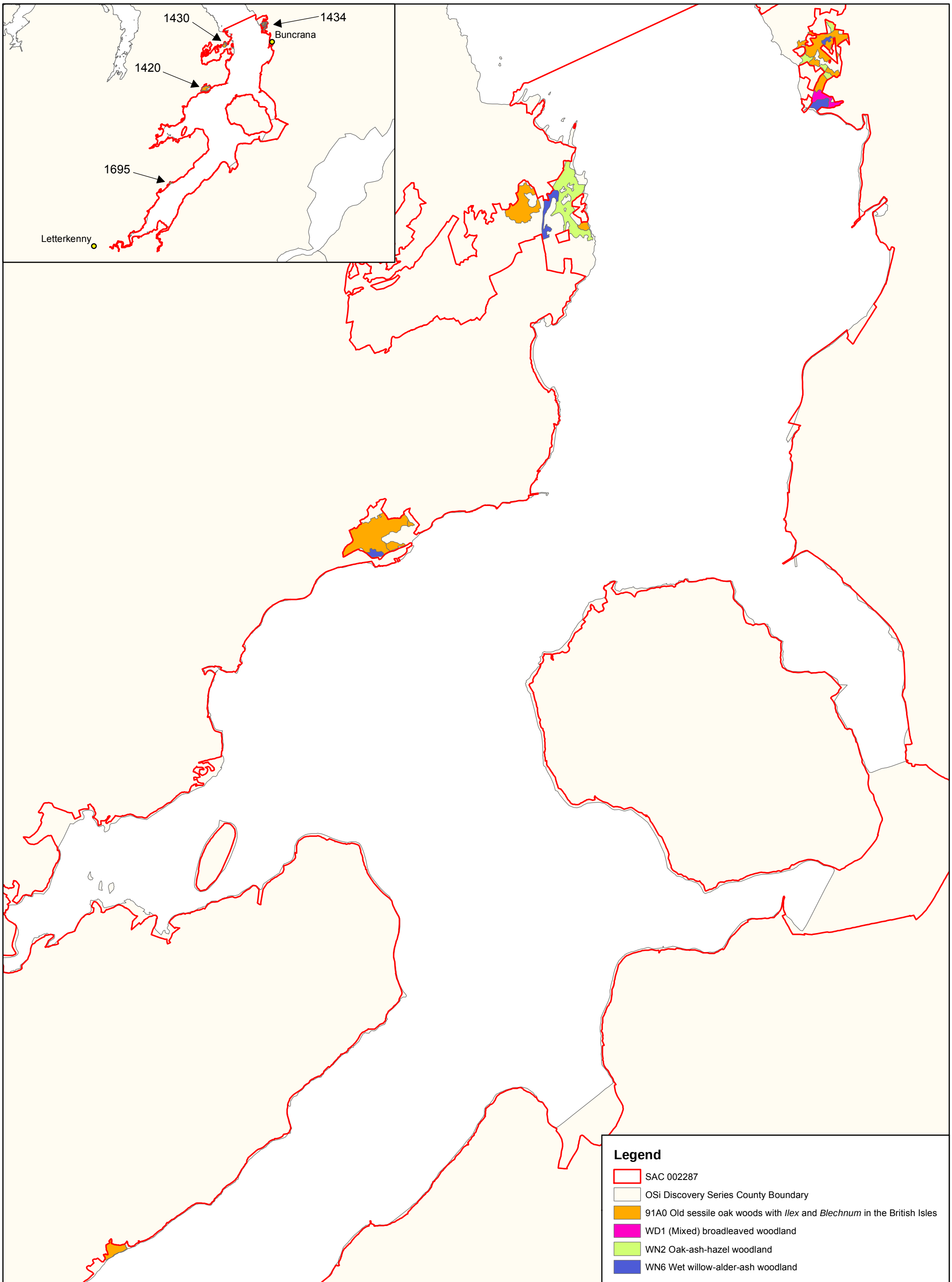
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



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MAP 6:
LOUGH SWILLY
CONSERVATION OBJECTIVES
OLD OAK WOODLANDS

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

CO. DONEGAL

0 0.5 1 1.5 2 km

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Map Version 1
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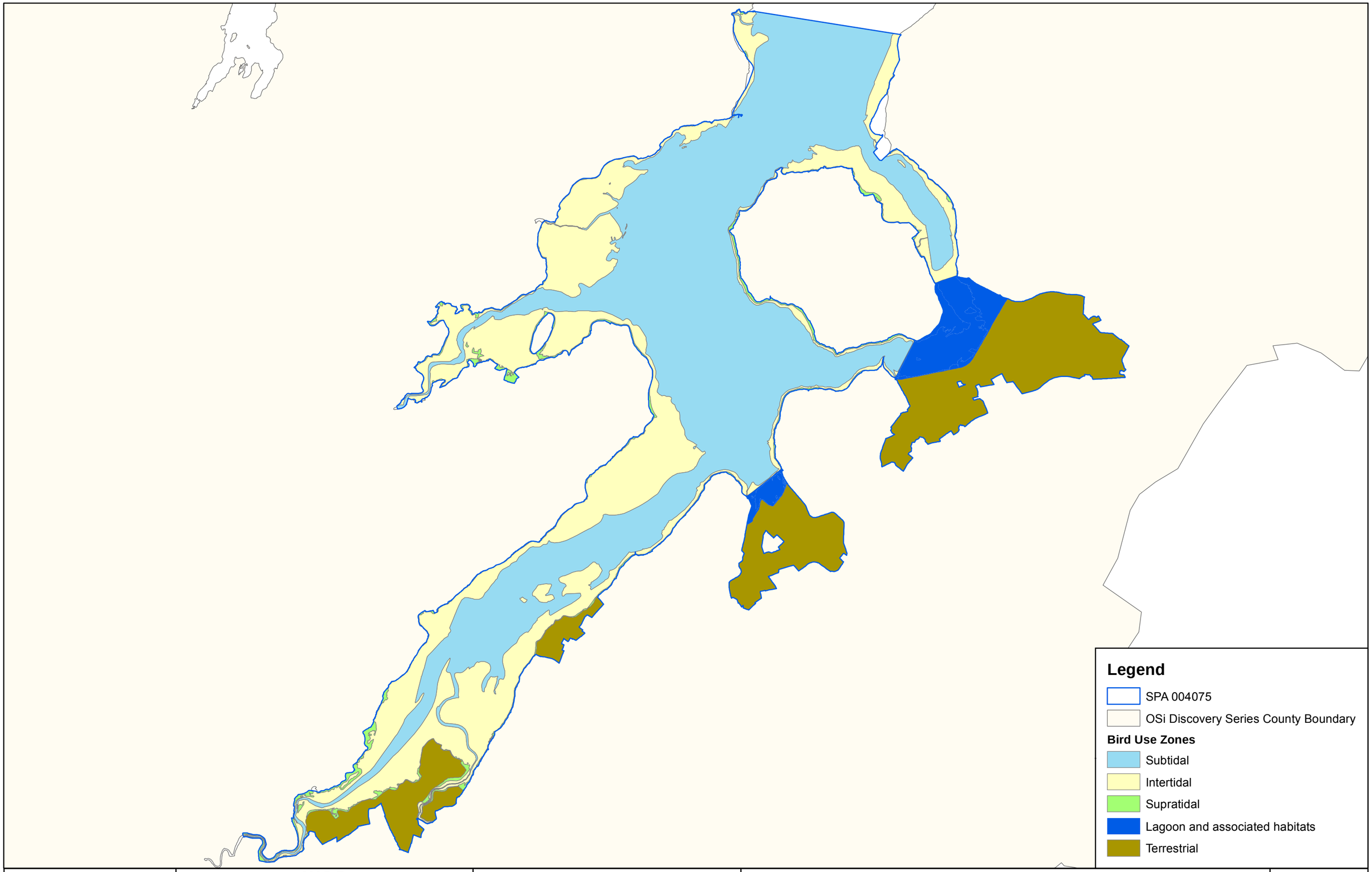

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MAP 7
LOUGH SWILLY
CONSERVATION OBJECTIVES
WETLANDS AND WATERBIRDS
BIRD USE ZONES

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

CO. DONEGAL

0 1 2 3 4 km

N

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SITE CODE

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