

## 6 ORNITHOLOGY

### 6.1 Introduction

This chapter of the ES/EIS outlines the ornithological interests in the vicinity of the proposed Carlingford Ferry development. Terrestrial ecology, marine ecology, marine mammals and fisheries are dealt with separately in Chapters 5 (Terrestrial Ecology) and 7 (Marine Ecology & Fisheries).

Both bird species names and common names are referred to within the text of this Chapter. Species names are only referred to in the first instance with common names referred to thereafter. Information presented in table form refer only to Standard British Trust for Ornithology (BTO) Species Codes. Appendix 6.1 provides a summary of bird species names, common names and Standard BTO Species Codes used throughout this chapter.

The Chapter should be read with the following Figures and Appendices:

- Figure 6.1 Proposed Development Location;
- Figure 6.2 Wetland Bird Survey Count Sections;
- Figure 6.3 Greenore Port Company Wetland Bird Survey Area;
- Figure 6.4 Greenore Port Company Wetland Bird Survey Zone 1 Delineation;
- Figure 6.5 Greenore Black Guillemot Colony;
- Figure 6.6 Greencastle Black Guillemot Colony;
- Appendix 5.1 Natura Impact Statement/Habitats Regulation Assessment;
- Appendix 5.3 Designated Site Information;
- Appendix 6.1 Summary of Bird Species;
- Appendix 6.2 BTO WeBS Data;
- Appendix 6.3 Photographic Plates;
- Appendix 6.4 Wetland Bird Survey Conditions;
- Appendix 6.5 Wetland Bird Survey Peak Count Summary Season Breakdown.

This Chapter should be read with particular reference to Chapters 3 (Project Description), 5, 7 and 9 (Coastal Processes). Other chapters are referred to where appropriate.

#### 6.1.1 Study Area

Carlingford Lough is a shallow sea lough, which forms part of the border between Northern Ireland and the Republic of Ireland (Figure 6.1). The inner lough (Carlingford to Warrenpoint) is dominated by shallow waters and underlying muddy sand beds, with large areas of intertidal mud and sand flats exposed at low tide. The outer mouth of the lough (Greenore to Cranfield) presents deeper waters with a navigable channel, and an underlying mosaic of boulders, cobbles, pebbles and gravels, forming small scattered islands and reefs. The lough is of international and national importance for overwintering and breeding seabirds, waders and waterfowl, which feed, roost and nest on the loughs intertidal flats and islands.

The study area extends across the northern and southern shores of Carlingford Lough incorporating the Greenore footprint in Co. Louth and the Greencastle footprint in Co. Down (Figure 6.1). The study area also includes the waters and nearshore islands between the two footprints, the shorelines either side and the Greencastle Pier Road.

#### 6.1.2 Chapter Scope

##### 6.1.2.1 Scope of Ornithological Surveys

Following consultation with the Northern Ireland Environment Agency (NIEA) and National Parks and Wildlife Service (NPWS) (Chapter 2 Scoping and Consultation), the following ornithological field surveys were undertaken within the study area:

- Terrestrial Breeding Bird Survey;
- Breeding Black Guillemot Survey;
- Breeding Ringed Plover Survey;
- Wetland Bird Survey with supplementary Through the Tidal Cycle Counts (TTTCs).

These surveys are described in detail later within this chapter.

### 6.1.2.2 *Appropriate Assessment (Habitats Regulations Assessment)*

#### Republic of Ireland

European Directive 2009/147/EC on the Conservation of Wild Birds (The Birds Directive) and Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (The Habitats Directive), together form the overarching nature conservation legislation in force on the island of Ireland today. Under these Directives the most important sites for biodiversity are protected through designation as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), under The Habitats Directive and The Birds Directive respectively. SACs and SPAs are known as Natura 2000 sites, which are of European-wide importance. Together they form a network of nature conservation areas throughout European Member States, known as the Natura 2000 Network.

The Habitats Directive was initially transposed into Irish Law in 1997 by the European Communities (Natural Habitats) Regulations, 1997 (as amended). In 2011, The European Communities (Birds and Natural Habitats) Regulations, 2011 consolidated the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats (Control of Recreational Activities) Regulations, 2010.

These Regulations provide a mechanism for competent authorities to consider the possible implications of any plan or project on the Natura 2000 site network, before any decision is made to allow a plan or project to proceed. This consideration is known as an Appropriate Assessment (AA), which may be defined as:

"a focused and detailed impact assessment of the implications of a plan or project, alone and in combination with other plans and projects, on the integrity of a Natura 2000 site in view of its conservation objectives".

AA is required to be undertaken on the basis of scientific evidence, which is informed by information on the project and on the site and any analysis of potential effects on the site. This is then presented in a Natura Impact Statement (NIS) as required under Part XAB of the Planning and Development Act, 2000 as amended by section 57 of the Planning and Development (Amendment) Act, 2010.

The proposed development impinges upon Carlingford Lough SPA (Site Code: IE0004078) and Carlingford Shore SAC (Site Code: IE0002306) on the southern shore. The proposal also impinges on the Carlingford Lough pNHA (Site Code: NH452).

#### Northern Ireland

The Birds and Habitats Directives are transposed into Northern Irish legislation through The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) (as amended), referred to as The Habitats Regulations. The Habitats Regulations place a statutory duty on all competent authorities to act in accordance with the Directives and require a Habitats Regulations Assessment (HRA), previously referred to as an AA, to be carried out on any proposed plan or project, which has the potential to impact on a Natura 2000 site.

The proposed development impinges upon Carlingford Lough SPA (Site Code: UK9020161) on the northern shore of Carlingford Lough and also upon Carlingford Lough Ramsar Site (UK12004) on the northern shore.

As this Environmental Statement / Environmental Impact Statement (ES/EIS) is being submitted for planning simultaneously in Ireland and Northern Ireland, the legal term of a Natura Impact Statement (or NIS) as defined in Irish planning law is used for the Habitats Regulations Assessment which has been undertaken. An NIS has been prepared and is provided in Appendix 5.1 to assist in the completion of AA/HRA.

### 6.1.3 **Project Description**

A full description of the proposed development is provided in Chapter 3, and drawings which accompany that chapter. This information has been fully considered in preparing this impact assessment and NIS.

### 6.1.4 **Key Sources**

A desktop review was carried out to identify features of ornithological importance within the study area and surrounding region. From a biodiversity perspective, the proposed development footprints and a surrounding buffer zone of 2km was included in a trawl to collate relevant ornithological data and anecdotal information to

assist with the impact assessment. Reference was made to the following key pieces of legislation and documents:

#### European

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as 'The Habitats Directive');
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (hereafter referred to as 'The Birds Directive').

#### All-Ireland

- The status of birds in Ireland: an analysis of conservation concern 2008-2013. (Lynas *et al.*, 2007) (Birds of Conservation Concern in Ireland (BoCCI)).

#### Republic of Ireland

- The Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 Wildlife (Amendment) Act 2010 (hereafter referred to as 'The Wildlife Act');
- European Communities (Conservation of Wild Birds) Regulations 1985 (S.I. 291/1985); and as amended by S.I. 31/1995;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 and as amended by S.I. 233/1998 & S.I. 378/2005; (The Habitats Regulations);
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011);
- The Planning & Development Acts, 2000-2010;
- National Biodiversity Plan, 2002;
- Louth County Development Plan 2007-2015.

#### Northern Ireland

- The Wildlife (Northern Ireland) Order 1985 (S.I. 1985/171 (N.I. 2)) as amended by The Wildlife (Amendment) (Northern Ireland) Order 1995 (S.I. 1995 No. 761 (N.I. 6)) (hereafter referred to as 'The Wildlife Order');
- The Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (S.I. 1985/170) (hereafter referred to as 'The Nature Conservation and Amenity Lands Order');
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (S.R. 1995 No. 380) as amended by the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2004 (S.R. 2004 No. 435), The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007 (S.R. 2007 No. 345) and The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2009 (S.R. 2009 No. 8) (hereafter referred to as 'The Conservation Regulations');
- The Northern Ireland Biodiversity Strategy (EHS, 2002);
- The Environment (Northern Ireland) Order 2002 (S.I. 2002/3153 (N.I. 7)) (hereafter referred to as The Environment Order);
- The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (S.R. 2003 No. 544);
- The Wildlife and Natural Environment (Northern Ireland) Act 2011 (hereafter referred to as The WANE Act); and
- Banbridge/Newry and Mourne Area Plan 2015.

The following websites were consulted:

- Wildfowl & Wetlands Trust (<http://www.wwt.org.uk/>);
- BirdWatch Ireland (BWI) (<http://www.birdwatchireland.ie/>);
- BTO ([www.bto.org/](http://www.bto.org/));
- Joint Nature Conservancy Committee (JNCC) (<http://www.jncc.gov.uk/>);
- Institute of Ecology & Environmental Management (IEEM) (<http://www.ieem.net/>).

The following databases were also consulted:

- NPWS Maps & Data (<http://www.npws.ie/en/MapsData/>);
- NIEA Maps (<http://maps.ehsni.gov.uk/naturalheritage/>);
- BWI Irish Wetland Bird Survey (I-WeBS) data;
- BTO Wetland Bird Survey (WeBS) data;

- BTO Little Ringed Plover and Ringed Plover Breeding Survey data (2007);
- BTO Non-Estuarine Coastal Waterbird Survey (NEWS) data;
- JNCC Seabird Monitoring Programme (SMP) database.

In addition there are a small number of previous reports, studies and datasets which have examined the ornithological interests within the vicinity of the proposed development, and have been made available for the purpose of this Chapter. These include:

- Unpublished (2009) Greenore Port Development - Draft Environmental Impact Statement;
- Louth County Council (2012) Narrow Water Bridge - Environmental Impact Statement/Environmental Statement;
- Louth County Council (2012) Narrow Water Bridge - Natura Impact Statement;
- Greenore Port Company - Wetland Bird Survey datasets (2011/12).

### 6.1.5 Consultation

The written responses received from consultees with particular relevance to ornithology are presented in Chapter 2.

Formal consultations were undertaken with the following organisations, which were felt to be of particular relevance to ornithology:

- NIEA;
- NPWS;
- BWI;
- The Royal Society for the Protection of Birds Northern Ireland (RSPB, NI) and;
- Department of Environment, Heritage & Local Government (DEHLG).

### 6.1.6 Field Survey Methodologies

#### 6.1.6.1 Terrestrial Breeding Bird Survey

The field survey methodology employed was a scaled down version of the British Trust for Ornithology's (BTO) Common Bird Census (CBC) technique (Bibby *et al.*, 1992 & Gilbert *et al.*, 1998), which aimed to capture a snap-shot of breeding bird activity within the vicinity of the development. The survey area therefore comprised proposed land takes at both Greenore and Greencastle and roadside boundaries along the Greencastle Pier Road.

The methodology broadly required a skilled surveyor to walk the survey area and record bird activity over a series of staggered visits between April and July. During each visit all bird species encountered were recorded using standard BTO 'Species Codes' and 'Categories of Breeding Evidence' e.g. singing male present (S), agitated behaviour (A), adult carrying faecal sac or food for young (FF), recently fledged young (FL). No attempts were made to locate nests as such behaviours are generally considered sufficient to determine probable or confirmed breeding territories. All visits commenced shortly after dawn and were completed before mid-day, to coincide with the peak breeding bird activity period.

A summary of breeding bird territories was then compiled using the activities observed over all visits.

#### 6.1.6.2 Breeding Ringed Plover *Charadrius hiaticula* Survey

The Ringed Plover is a small wading bird, which breeds and overwinters around Irelands coastlines. During the breeding season pairs typically favour shoreline nesting sites above the high-water line on exposed shingle or sandy beaches. The species can also be found nesting inland along rivers and lakeshores and within artificial quarries, particularly within the west and north of Ireland. Human disturbance has however, lead to a decrease in nesting success in more recent years and the species is currently an Amber-listed BOCCI. Suitable shoreline nesting habitats exists at both Greenore and Greencastle.

The survey methodology employed was consistent with those outlined in Gilbert *et al.* (1998) and Bibby *et al.* (1992). Ringed Plover are best surveyed when they when they are incubating during May and June, by carefully scanning suitable breeding habitat and mapping evidence of nesting birds. Suitable coastal nesting habitat can include sand, gravel and shingle beaches, saltmarshes and occasionally grazed coastal pastures. No efforts were be made to prove breeding i.e. find nests, eggs or broods, but signs indicative of

breeding such as 'broken wing' displays, agitated behaviour or recently fledged young were recorded. Such signs are considered sufficient to indicate breeding territories.

The survey area comprised approx 800m of shoreline at both Greenore and Greencastle, which extended approx 400m either side of the projects terrestrial footprints. Three visits to the survey area were undertaken at least 10 days apart during May and June 2011 during the hours of 08h30 and 18h00. Sections of shoreline were surveyed by scanning 50-100m ahead using binoculars and then walking quickly to the next section and repeating the process (Bibby *et al.*, 1992). The route walked aimed to avoid passing directly over potential nesting habitat and was largely restricted to the intertidal zone.

### **6.1.6.3 Breeding Black Guillemot *Cephus gylle* Survey**

Black Guillemots are an entirely marine species, which nest singly or in loose colonies along Ireland's rocky coastlines. Nest-sites are typically within natural holes, rock crevices, caves and boulder beaches, adjacent to shallow coastal waters with an abundance of benthic prey. Black guillemots will also readily take to cracks and fissures in man-made structures such as quay walls, harbours, piers and lighthouses. The use of such artificial habitats has led to notable increases in breeding populations in Northern Ireland in recent years (Mitchell *et al.*, 2004, Nairn & O'Halloran, 2012).

Black Guillemots are known to nest within Greenore Port and at Greencastle (Mitchell *et al.*, 2004), and thus in immediate proximity to the proposed development. A breeding survey was therefore undertaken to determine the location and spread of nesting pairs at Greenore and Greencastle, and to ascertain a measure of productivity.

#### **Population Survey**

The methodology employed was consistent with that described by Walsh *et al.*, (1995) and Gilbert *et al.* (1998). Two visits to a survey area are typically required within the first three weeks of April during the pre-laying period, although counts in late-April or early-May are also acceptable. As Black Guillemots often nest in scattered pairs or loose colonies, an approx 800m stretch of coastline was surveyed (approx 400m either side of the project footprints) rather than discrete 'Greenore' and 'Greencastle' colony locations.

Two visits were made to both Greenore and Greencastle survey areas in good survey conditions between the hours of 06h00 and 08h00 in April and May 2012, to coincide with the period when the majority of birds are within the vicinity of their nesting sites. All birds observed within 300m of the shore were recorded into:

- birds in adult summer plumage;
- birds in other plumages;
- birds >300m offshore (thus less obviously associated with potential breeding habitat within the survey area).

Any foraging birds were noted separately.

The extent of probable nesting habitat was noted for each survey area along with likely nesting sites where possible. Additional observations were also collected during wetland bird counts and boat-based surveys detailed below. Survey conditions, the presence of breeding gulls and signs of mammalian predators were also noted.

#### **Productivity Survey**

To facilitate any future monitoring a measure of productivity was obtained from the 2012 breeding season. The methodology employed was consistent with 'Method 2' as outlined by Gilbert *et al.* (1998) for inaccessible nest-sites. Two visits are required to estimate productivity, one in early-May (early incubation) and a second in mid or late-July (pre-fledging). Productivity ( $p$ ) was calculated by dividing the number of successful nest-sites in July, by the number of nest-sites occupied in May.

### **6.1.6.4 Wetland Bird Survey**

A Wetland Bird Survey was used to collate information on bird usage of the proposed development footprints, adjacent shorelines, nearshore islands and navigable waters between Greenore and Greencastle by wetland birds (including. all gulls, waterfowl, seabirds, seaducks and waders).

The survey area consisted of approx 1.2km stretches of shoreline extending 500m either side of the proposed project footprints at Greenore and Greencastle, nearshore islands including Green Island, Greenore Point and Blockhouse Island (where weather permitted) and the open waters to be navigated by the ferry. Survey areas were sub-divided into count sections detailed below (Figure 6.2).

The survey methodology was primarily based on the method employed by the BTOs WeBS "Core Counts" and "Low Tide Counts" (Gilbert *et al.*, 1998) and is also consistent with BWIs I-WeBS counts. The methodology broadly entailed a surveyor to undertake twice-monthly point counts of all wetland birds within each shoreline count section to approx 300m of the shoreline during high and low tide conditions:

- 1) High tide counts - within two hours either side of high tide, primarily to establish the locations of high roosts and numbers of wetland birds occupying roost sites;
- 2) Low tide counts - within two hours either side of low tide, primarily to establish the locations of any important intertidal foraging areas and the numbers of wetland birds using them.

Land-based surveys were found to be insufficient in collating ornithological data along the proposed ferry route particularly from nearshore islands and open waters to be navigated by the ferry. This was due to low lying land at Greenore and Greencastle limiting distant observations. Counts were therefore undertaken from a small vessel. This allowed a more accurate count of the whole survey area and assessment of the importance of open waters and islands navigated by the proposed vehicular ferry for both breeding and wintering wetland birds. Surveys aimed to navigate the proposed ferry route and record bird usage of the waters, nearshore islands and shorelines. Methodology guidance was sought from Gilbert *et al.* (1998) and Camphuysen *et al.* (2004) where possible. Counts were undertaken over a full calendar year (September 2011 to October 2012 inclusive).

### Greenore Survey Area

This section should be read with reference to Figure 6.2.

- South West Greenore Shoreline (Count Section 1.1)  
This count section includes a 250m buffer zone to the south west of the Greenore development area and comprises approx 25% exposed sand/muds at low tide. Intertidal exposure is most extensive to the count sections southerly extent approaching the Lough boundary of the Greenore Golf Course. The survey area is bounded by the Greenore Port quay wall and overlaps the Greenore Breakwater. The Greenore Breakwater was counted separately (Count Section 1.4).
- Greenore Development Area (Count Section 1.2)  
This count section comprises the proposed Greenore development footprint and a 250m buffer zone either side. The count section is bounded by the existing Greenore Port and is predominantly submerged throughout the tidal cycle. Only a narrow band of gravely sands is exposed at low tide (approx 5% of the count section). The count section is bounded by a narrow shingle beach and rock armour to the south east of the development footprint, which is backed by a small patch of amenity grassland. The count section ends at the concrete slipway adjacent to the Greenore Coastguard Station and overlaps the Greenore Breakwater.
- South East Greenore Shoreline (Count Section 1.3)  
Similar to the development zone the 250m buffer zone to the south east of the development footprint is predominantly submerged throughout the tidal cycle, with only a narrow band of gravely sand (grading to sand/mud) exposed at low tide (approx 15% of the count section). The count section is bounded by a narrow shingle beach, backed by semi-improved grasslands and a rough car parking area.
- Greenore Breakwater (Count Section 1.4)  
The wooden Greenore Breakwater lies approx 100m from the Greenore Port quay wall and was counted separately to distinguish any importance for roosting birds.

### Greencastle Survey Area

This section should be read with reference to Figure 6.2.

- North West Greencastle Shoreline (Count Section 2.1)  
This count section includes a 250m buffer zone to the north west of the Greencastle development footprint extending southeast from Greencastle Point towards the existing wooden Greencastle Pier. The survey area comprises approx 10% of exposed muds and sands at low tide between small rocky outcrops, but remains predominantly underwater throughout the tidal cycle. The survey area is

backed by a narrow shingle beach, a semi-improved grassy verge and the Residential Greencastle Pier Road.

- Greencastle Development Area (Count Section 2.2)  
The Greencastle development area includes the proposed Greencastle footprint and a 250m buffer zone either side. The count section includes the wooden Greencastle Pier and comprises a significant area of exposed sands at low tide adjacent to shallow open water (approx 35%). There is also a small rocky outcrop within the count sections southerly eastern extent and the start of the oyster trestles, which extend into Count Section 2.3. The Count Section is bounded by a shingle beach, a small improved grassland field and residential dwellings.
- South East Greencastle Shoreline (Count Section 2.3)  
The southeast buffer area is largely comprised of exposed sands at low tide (approx 50%) but is almost completely inundated at high tide apart from a narrow shingle beach. The count section contains rows of oyster trestles exposed at low tide, with a more extensive coverage of trestles remaining underwater throughout the tidal cycle. The count section is bounded by a shingle beach, backed by dunes and semi-improved grasslands. The count section also contains a small rocky outcrop, largely exposed throughout the tidal cycle.
- Green Island (Count Section 2.4)  
Green Island comprised of rock and shingle lies approx 600m from the Greencastle development footprint. At low tide the underlying rock of the island is exposed. High tides typically submerge the majority of the island with only a shingle 'plateau' and a small number of rocky outcrops remaining above the water mark.
- Greencastle Point Islands (Count Section 2.5)  
The nearshore rocky islands off Greencastle Point lie approx 660m from the Greencastle development footprint. At low tide the islands are accessible from the Greencastle shoreline to the north of the Greencastle Dock, but become isolated at high tide.

## Ferry Route

This section should be read with reference to Figure 6.2. During the preliminary project concept two route options were considered, one passing between Greenore and Greencastle to the north of Green Island and the other passing to the south. The Wetland Bird Survey therefore covered both route options. In the final project concept only a route passing to the south of Green Island is considered.

Each route was travelled once during each bi-monthly point count at a speed of 5-10 knots. All birds within 300m either side of each route were recorded including those on navigational markers.

### 6.1.6.4.1 Through the Tidal Cycle Counts (TTCCs)

In addition to twice-monthly point counts detailed above supplementary counts were made during the critical wintering season (September to March) to more fully assess the use of the proposed developments shoreline footprints and adjacent shoreline areas by overwintering wetland birds. These counts were based on a scaled down version of the BTOs TTCC methodology, to provide a more complete impression of overwintering wetland bird use of the shoreline count sections through the tidal cycle.

A series of hourly point counts were made between tidal conditions on a single day, once per calendar month between October 2011 and March 2012 with a final count made in September 2012. Due to limited daylight hours within these months, counts typically commenced or ceased within two hours of high or low tide. The priority focus was on identifying the use of the Greencastle and Greenore shoreline survey areas by foraging birds during low tide and roosting birds during high tide.

Only Count Sections 1.1-1.4 and 2.1-2.3 were included in TTCCs.

## 6.1.7 Impact Assessment

In the assessment stage, impact assessment was undertaken in accordance with the Institute of Ecology and Environmental Management (IEEM) *Guidelines for Ecological Impact Assessment in the United Kingdom* (2006), and also using experience of 'best practice' in the ecological assessment of similar developments. Ecological features are firstly valued (Table 6.1). The magnitude of an impact is assessed using criteria set out in Table 6.2. The impact significance (Table 6.3) is a combined function of the ecological value of the

affected feature and the magnitude of the impact. It is important to note that there is no universally recognised definition of what constitutes significance. A combination of data, experience and the precautionary principle were therefore employed to select the appropriate ecological value, and magnitude categories.

The ecological value of a feature is generally relatively easy to categorise. However, the magnitude of potential impact may be difficult (or in certain cases impossible) to categorise. The following parameters were therefore considered:

- Physical nature;
- Type (+ve/-ve, Direct/Indirect);
- Range of species & habitats affected;
- Population sizes of species & habitats affected;
- Geographic scale;
- Duration;
- Cumulative effects.

Once identified, and characterised for magnitude, each potential impact was assigned a likelihood of occurrence (after mitigation):

- Certain (100%);
- Near-certain (95-100%);
- Probable (50-95%);
- Unlikely (5-50%);
- Extremely Unlikely (0-5%).

**Table 6.1: Ecological Value of Features**

Value	Criteria	Examples
Very high	High importance and rarity, international scale and limited potential for substitution	Internationally designated sites
High	High importance and rarity, national scale, or regional scale with limited potential for substitution	Nationally designated sites. Regionally important sites with limited potential for substitution.
Medium	High or medium importance and rarity, local or regional scale, and limited potential for substitution	Regionally important sites with potential for substitution. Locally designated sites.
Low	Low or medium importance and rarity, local scale	Undesignated sites of some local biodiversity and earth heritage interest
Negligible	Very low importance and rarity, local scale	Other sites with little or no local biodiversity and earth heritage interest

Potential impacts described in later sections assume no specific mitigation measures. Specific mitigation measures are therefore proposed where required to neutralise impacts identified as likely.

**Table 6.2: Criteria for Determining the Magnitude of Potential Ecological Impact**

Magnitude	Criteria
Major negative	The proposal (either on its own or with other proposals) may adversely affect the integrity of the site, in terms of coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and / or the population levels of species of interest.
Intermediate negative	The site's integrity will not be adversely affected, but the effect on the site is likely to be significant in terms of its ecological objectives. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on integrity, then the impact should be assessed as major negative.
Minor negative	Neither of the above applies, but some minor negative impact is evident. (In case of Natura 2000 sites a further appropriate assessment may be necessary if detailed plans are not yet available).
Neutral	No observable impact in either direction.
Positive	Impacts which provide a net gain for wildlife overall.



**Table 6.3: Estimating the Overall Ecological Appraisal Category**

Magnitude of Potential Impact	Ecological value of sites damaged or improved				
	Very high	High	Medium	Low	Negligible
Major negative	Very large adverse	Very large adverse	Moderate adverse	Slight adverse	Neutral
Intermediate negative	Large adverse	Large adverse	Moderate adverse	Slight adverse	Neutral
Minor negative	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Positive	Large beneficial	Large beneficial	Moderate beneficial	Slight beneficial	Neutral

## 6.2 Baseline Assessment

### 6.2.1 Consultation

A full list of consultees contacted as part of EIA and the responses received is reported in Chapter 2 of this ES/EIS.

Formal written consultation was undertaken with the following authorities of particular relevance to ornithology:

- NIEA;
- NPWS;
- RSPB, NI;
- BWI and;
- DEHLG.

External datasets were also obtained from:

- RSPB, NI;
- BTO;
- JNCC and;
- Greenore Port Company.

### 6.2.2 Designated Sites for Nature Conservation in Northern Ireland

This section should be read with reference to Figure 6.1.

The proposed Greencastle terminal on the northern shore of Carlingford Lough is partially located within three statutory sites designated for ornithological features of interest in Northern Ireland:

- Carlingford Lough Special Protection Area (Site Code: UK9020161);
- Carlingford Lough Area of Special Scientific Interest (Site Code: ASSI 103);
- Carlingford Lough Ramsar Site (Site Code: UK12004).

All site citation documents, Natura 2000 Standard Data Forms and conservation objectives are provided in Appendix 5.3. Only sites with features of ornithological interest are considered here.

All qualifying features and populations detailed below are taken given from the time of designation according to documents contained within Appendix 5.3.

#### 6.2.2.1 Special Protection Areas (SPAs)

##### Carlingford Lough SPA (Site Code: UK9020161)

The Northern Ireland (NI) designated Carlingford Lough SPA lies between Killowen Point and Soldiers Point on the northern shores of Carlingford Lough. It includes all lands and intertidal areas seawards to the limits of

Northern Irish territorial waters. Marine areas below mean low water are not included. Carlingford Lough SPA forms part of an extended cross-border site with the Republic Of Ireland (ROI) designated Carlingford Lough SPA on the Loughs southern shores, which supports internationally important numbers of overwintering Pale-bellied Brent Geese *Branta bernicla hrota*.

The site qualifies for designation under Article 4.1 of The Birds Directive by supporting populations of European importance of the following species listed on Annex I of the directive during the breeding season:

<b>Sandwich Tern</b> <i>Sterna sandvicensis</i>	575 breeding pairs	Five year mean for the period 1993 - 1997	1.2% of the international population 13.1% of the Irish population
<b>Common Tern</b> <i>Sterna hirundo</i>	339 breeding pairs	Five year mean for the period 1993 - 1997	12.6% of the Irish population

The site also qualifies for designation under Article 4.2 of The Birds Directive by supporting populations of European importance of the following migratory species during the wintering season:

<b>Pale-bellied Brent Goose</b> <i>Branta bernicla hrota</i>	319 individuals	Five year mean for the period 1991/92 - 1995/6	1.6% of the international and Irish population.
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The site has also previously supported nesting Roseate Tern *Sterna dougallii*, with two breeding pairs recorded for 1997. Nationally important numbers of Arctic Tern *Sterna paradisaea* have also bred in the past.

The cross-border site also supports nationally important numbers of Oystercatcher *Haematopus ostralegus* (the five year mean for the period 1991/92 to 1995/96 is 850 birds - 1.7% of the Irish population), Ringed Plover (168 ~1.3%), Grey Plover *Pluvialis squatarola* (58 ~1.5%), Dunlin *Calidris alpina* (1494 ~1.2%) and Redshank *Tringa totanus* (640 ~2.6%).

### 6.2.2.2 Areas of Special Scientific Interest (ASSIs)

Other pertinent national legislation in relation to designated sites and protected species in Northern Ireland include The Wildlife Order, The Nature Conservation and Amenity Lands Order and The Environment Order.

ASSIs are designated under The Wildlife Order and their protection strengthened under The Environment Order.

#### Carlingford Lough ASSI (Site Code: ASSI 103)

Carlingford Lough is designated an ASSI by virtue of its Geological Series, Coastal Saltmarsh, Mudflats, *Zostera* (Seagrass Beds), Wintering Waterbirds and Breeding Terns.

The site regularly supports an internationally important wintering population of Pale-bellied Brent Geese (average of 255 birds, representing 1.3% of the world population), nationally significant numbers of wintering Great Crested Grebe *Podiceps cristatus* (an average of 200 birds, 6.7% of the all-Ireland wintering population), Shelduck *Tadorna tadorna* (233 ~3.3%), Scaup *Aythya marila* (342 ~11.4%), Red-breasted Merganser *Mergus serrator* (36 ~1.8%), Oystercatcher (783 ~1.6%), Dunlin (1598 ~1.3%), Redshank (626 ~2.8%) and Greenshank *Tringa nebularia* (12 ~1.4%).

Carlingford Lough is also of significance for its internationally important breeding Roseate Tern population, holding some 4.3% of the European Community population. In addition the site also regularly supports nationally important Sandwich, Common and Arctic Tern populations.

There are no further ASSIs within 2km of the proposed development.

### 6.2.2.3 Ramsar Sites

Sites designated for their nature conservation value, which are not statutorily protected, derive from International Treaties and Regional Planning Policy. The Ramsar Convention (The Convention on Wetlands on International Importance, especially as Waterfowl Habitat) is an international treaty for the conservation and sustainable utilisation of wetlands, which is designed to stem the progressive encroachment on and loss

of wetlands. The Convention was developed and adopted by participating nations at a meeting in Ramsar, Iran in 1971 and came into force in 1975. The United Kingdom was one of the original signatory nations.

Under the Ramsar Convention a site recognised as an internationally important wetland qualifies for designation as a Ramsar Site. Under Criterion 6 of the convention, a wetland is considered internationally important if it regularly holds at least 1% of the individuals in a population of one species or subspecies of waterbird, while Criterion 5 states that any site regularly supporting 2,000 or more waterbirds also qualifies.

#### **Carlingford Lough Ramsar Site (Site Code: UK12004)**

The Carlingford Lough Ramsar Site qualifies for designation under Criterion 2 and 6 of the Ramsar Convention:

- Criterion 2 - By supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species. The site supports nationally important breeding populations of common tern. In the recent past the site also supported nationally important numbers of Arctic Tern. Roseate Terns have also previously bred, with 2 breeding pairs recorded in 1997.
- Criterion 6 - By supporting species/populations occurring at levels of international importance including Sandwich Tern during the breeding season [650 apparently occupied nests, representing an average of 0.7% of the breeding population], and Pale-bellied Brent Goose during the winter [300 individuals representing an average of 1.5% of the population, five year peak mean 1998/9-2002/3].

#### **6.2.2.4 Important Bird Areas (IBAs)**

IBAs are sites selected as important for bird conservation because they regularly hold significant populations of one or more globally or regionally threatened, endemic or congregatory bird species or highly representative bird assemblages. The European IBA programme aims to identify, monitor and protect key sites for birds all over the continent. It aims to ensure that the conservation value of over 4,000 IBAs is maintained and where possible enhanced. Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

#### **Carlingford Lough IBA (Site Code: UK274)**

The NI Carlingford Lough IBA is a cross-border site, the southern shore lying in County Louth in the ROI. The site is important for breeding Terns and wintering waterbirds. It is also nationally important for wintering Great Crested Grebe (215 birds ~2%). It was first identified in 1987 as Carlingford Lough including Green Island (renamed in 2007). The IBA factsheet can be downloaded from <http://www.birdlife.org>.

The site qualifies for designation under IBA criteria B1i, B2, C3 and C6:

- B1i - The site is known or thought to hold  $\geq 1\%$  of a flyway or other distinct population of a waterbird species: Trigger species - Pale-bellied Brent Goose.
- B2 - The site is one of the 'n' most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate. Trigger species - Scaup.
- C3 - The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive). Trigger species - Pale-bellied Brent Goose.
- C6 - The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union. Trigger Species - Sandwich Tern and Common Tern.

Table 6.4 below provides a summary of the Carlingford Lough IBA trigger species.

**Table 6.4: Carlingford Lough (UK274) IBA Trigger Species**

BTO Species Code	Season	Period	Population Estimate	Quality of Estimate	IBA Criteria
CA	Winter	2002-2006	210 i	Good	C6
CN	Breeding	2006	509 p	Good	C6
CN	Breeding	2000	398 p	Good	C6
GG	Winter	2002-2006	190 i	Good	C6
QN	Winter	2002-2006	495 i	Good	B1i, C3
RK	Winter	2002-2006	1,278 i	Good	B2, C6
RM	Winter	2002-2006	118 i	Good	C6
SP	Winter	2002-2006	255 i	Good	B2
TE	Breeding	2000	650p	Good	B1i, B2, C2, C6
TE	Breeding	2006	826 p	Good	B1i, B2, C2, C6
<b>Key to Table 6.4</b>					
i - Individuals					
p - Pairs					

### 6.2.3 Non-Designated Sites for Nature Conservation in Northern Ireland

#### 6.2.3.1 RSPB Nature Reserves

The RSPB currently manage almost 130,000 hectares of land across 200 nature reserves throughout the UK, for both breeding and wintering birds.

#### Carlingford Lough Islands RSPB Nature Reserve

The Carlingford Lough Islands RSPB Nature Reserve is located in the mouth of Carlingford Lough and comprises Green Island, Blockhouse Island and the small nearshore islands off Greencastle Point (Figure 6.1). The reserve is leased from the National Trust and managed and monitored by the RSPB due its importance for the Carlingford Lough nesting Tern population.

The Loughs nesting Tern population is primarily supported on Green Island comprised of rock and shingle. The island has historically supported four out of five Tern species which breed in Ireland, namely Sandwich, Common, Arctic and Roseate Tern. Nesting Roseate Terns were historically lost from the island and in more recent years returning Arctic, Common and Sandwich colony has undergone dramatic fluctuations.

### 6.2.4 Designated Sites for Nature Conservation in the Republic of Ireland

This section should be read with reference to Figure 6.1. All Natura 2000 Standard Data Forms and site synopses are provided in Appendix 5.3.

The proposed Greenore terminal on the southern shore of Carlingford Lough is partially located within three statutory sites designated for nature conservation in the Republic of Ireland:

- Carlingford Lough Special Protection Area (Site Code: IE0004078);
- Carlingford Shore Special Area of Conservation (Site Code: IE002306); and
- Carlingford Lough proposed Natural Heritage Area (Site Code: NH452).

Only sites with features of ornithological interest are considered here. All qualifying features and associated populations discussed below are taken given from the time of designation according to documents contained within Appendix 5.3.

#### 6.2.4.1 SPAs

##### Carlingford Lough SPA (IE0004078)

The ROI designated Carlingford Lough SPA as updated in 2011 comprises the southern shoreline of Carlingford Lough, which extends from the harbour at Carlingford to Ballagan Point (Figure 6.1). It includes all of the intertidal sand and mud flats to the low tide mark but excludes the area of shoreline at Greenore Port.

As updated in 2011 Carlingford Lough qualifies for designation under Article 4.1 of The Birds Directive by supporting internationally important populations of the following species:

<b>Pale-bellied Brent Goose</b> <i>Brant bernicla hrota</i>	253 individuals	wintering	Five year mean peak for the period 1995/96 - 1999/2000
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The intertidal flats also support a range of other wintering waterfowl species notably Wigeon *Anas penelope* (107), Oystercatcher (289), Dunlin (392), Bar-tailed Godwit (33), Redshank (108) and Turnstone (29), but all in relatively low numbers. Bar-tailed Godwit is of significant note due to its enlistment on Annex 1 of The Birds Directive. The sub-tidal areas outside the SPA also support a range of wintering species including Great Crested Grebe, Cormorant and Red-throated Diver.

#### 6.2.4.2 Natural Heritage Areas (NHAs)

Carlingford Lough is a proposed NHA (NH452). The boundary is similar to that of the Carlingford Shore SAC but extends seawards to the limits of Irish territorial waters. A site synopsis has not been published for the pNHA by NPWS. The proposed development is partially located within the pNHA.

#### 6.2.4.3 IBAs

##### Carlingford Lough IBA (Site Code: IE122)

The ROI Carlingford Lough IBA is important for wintering waterbirds including Pale-bellied Brent Goose (five year mean counts 1998-2002 of 336 birds ~1.3% of flyway population), Black-headed Gull (425), Common Gull (401), Dunlin (1168), Cormorant (110), Ringed Plover (101).

Carlingford Lough IBA is a cross-border site with most of the birds occurring along the northern shoreline of Carlingford Lough, within Northern Ireland. The southern shoreline is used only occasionally by large numbers of waterbird species. The IBA factsheet can be downloaded from <http://www.birdlife.org>.

The site qualifies for designation under IBA criteria B1i, B2 and C3:

- B1i - The site is known or thought to hold  $\geq 1\%$  of a flyway or other distinct population of a waterbird species: Trigger species - Pale-bellied Brent Goose.
- B2 - The site is one of the 'n' most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate. Trigger species - Scaup.
- C3 - The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive). Trigger species - Pale-bellied Brent Goose.

Table 6.5 below provides a summary of the Carlingford Lough IBA trigger species.

**Table 6.5: Carlingford Lough (IE122) IBA Trigger Species**

BTO Species Code	Season	Period	Population Estimate	Quality of Estimate	IBA Criteria	IUCN Category
QN	Winter	1995	315 i	Good	B1i, C3	Least Concern
SP	Winter	1996	650 i	Good	B2	Least Concern
<b>Key To Table 6.5</b>						
i - Individuals						

#### 6.2.5 Designated Sites Summary

Table 6.6 provides a summary of designated sites and their qualifying features considered within this Chapter.

**Table 6.6: Summary of designated site qualifying ornithological features and populations**

BTO Species Code	Carlingford Lough SPA (NI)	Carlingford Lough ASSI	Carlingford Lough Ramsar Site	Carlingford Lough SPA (ROI)	Carlingford Lough IBA (NI)*	Carlingford Lough IBA (ROI)
RS	-	√	√ (2 p)	-	-	-
AE	-	√ (64 p)	√	-	-	-
CN	√ (339 p)	√ (218 p)	√ (509 aon)	-	√ (509p)	-
TE	√ (575 p)	√ (59 p)	√ (650 aon)	-	√ (826p)	-
QN	√ (319 i)	√ (255 i)	√ (300 i)	√ (253i)	√ (495i)	√ (315i)
GG	-	√ (200 i)	-	-	√ (190i)	-
SU	-	√ (233 i)	-	-	-	-
SP	-	√ (342 i)	-	-	√ (255i)	√ (650i)
RM	-	√ (36 i)	-	-	√ (118i)	-
OC	-	√ (783 i)	-	-	-	-
DN	-	√ (1598 i)	-	-	-	-
RK	-	√ (676 i)	-	-	√ (1,278i)	-
CA	-	-	-	-	√ (210i)	-

**Key to Table 6.6**  
i - Individuals  
p - pairs  
\*Higher count number only

## 6.2.6 Existing Datasets

### 6.2.6.1 BTO Wetland Bird Survey Data

The Wetland Bird Survey (WeBS) is a joint scheme between the BTO, RSPB, JNCC and the Wildfowl and Wetlands Trust (WWT), which aims to monitor non-breeding waterbirds (including waterfowl and waders) throughout the UK. The data collected by this scheme is used to assess the size of waterbird populations, determine trends in their numbers and distribution, assess the importance of individual sites for overwintering waterbirds and facilitate the conservation of these sites.

The WeBS 'Core Counts' are the principal method the scheme uses to gather data from approximately 2,000 wetland sites throughout the UK. Sites are surveyed annually during the crucial winter period, September to March, on monthly co-ordinated 'Core Count Dates'. WeBS Core Counts are made using the 'look-see' methodology whereby an observer counts all species of waterbird in a pre-determined survey area. Counts are typically made within two hours either side of high-tide, when the majority of birds are at roost.

WeBS Low Tide Counts are also made at a smaller number of wetland sites and follow the methodologies employed for Core Counts. Data from these counts aim to monitor, assess and update information on the importance of intertidal feeding areas of UK estuaries for wintering waterbirds. The coverage of the WeBS Low Tide Count scheme is low in Northern Ireland and subsequently no count sites were found to be relevant to the wider project area. The nearest site with available data is Dundrum Bay.

The WeBS counting year runs from July to June (so year 08/09 includes data from July 2008 to June 2009). The year is divided into three functional counting seasons: Autumn (July to October - Autumn Passage); Winter (November to March - Wintering Population) and Spring (April to June - Spring Passage).

A data request was submitted to the BTO for the most recent 5-years WeBS high-tide core counts completed at the following relevant WeBS sites within 2km of the project footprint:

- Mill Bay (01407);
- Carlingford to Greenore (01419)
- Greenore to Ballagan Point (01908).

At the time of request the BTO held no data for Carlingford to Greenore (01419) but held data up to 2008/09 for Greenore to Ballagan Point (01908) and up to 2009/10 for Mill Bay (01407).

### Greenore to Ballagan Point (01908)

Table 6.7 lists all bird species and peak counts recorded for the Greenore to Ballagan Point (01908) from count years 2004/05 to 2008/09, along with 1% national (all-Ireland) and international threshold levels (Holt *et al.*, 2012). Tabulated five year summary datasets as received from BTO are provided in Appendix 6.2. A total of 22 bird species were recorded along this stretch of the southern Carlingford Lough shoreline.

Any site recognised as being of international ornithological importance is considered for classification as an SPA under The Birds Directive. In the Republic of Ireland and Northern Ireland a wetland is considered to be of national importance if it regularly holds 1% or more of the estimated all-Ireland population. A wetland may be considered of international importance if it regularly holds 1% or more of the estimated international population. Therefore any site regularly supporting 1% of the national or international threshold for a species or subspecies of waterbird, potentially qualifies for designation under national legislation or The Birds Directive.

It should be noted that this WeBS Site comprises a more extensive section of the Greenore to Ballagan shoreline that was included within the count sections included RPS Wetland Bird Surveys, specifically undertaken as part of this assessment.

Greenore to Ballagan Point (01908) regularly<sup>1</sup> supports a notable proportion of the ROI Carlingford Lough SPA overwintering Pale-bellied Brent Geese population during the winter (winter mean peak ~20% of 253 individuals), along with notable numbers of Oystercatcher (winter peak mean 260), Curlew (63), Dunlin (320) and Redshank (127) between 2004/05 to 2008/09. Turnstone is also regularly present in numbers close to national importance (winter peak mean of 100 ~83% of national threshold).

**Table 6.7: Greenore to Ballagan Point (01908) BTO WeBS Peak Summary Data**

BTO Species Code	Autumn		Winter		Spring		1% of National	1% of International
	Max	Mean Peak	Max	Mean Peak	Max	Mean Peak		
BA	0	0	34	11	0	0	160	1,200
CA	56	21	18	15	0	0	140	1,200
CS	3	1	0	0	0	0	?	17,300
CU	71	30	105	63	0	0	550	8,400
DN	6	1	500	320	0	0	880	13,300
GG	1	0	3	2	0	0	50	3,500
GP	4	1	48	17	0	0	1,700	9,300
H.	6	1	2	2	1	1	30	2,700
KN	30	6	3	1	0	0	190	4,500
L.	0	0	200	101	0	0	2,100	**20,000
MA	0	0	2	1	2	2	380	**20,000
ND	0	0	17	5	0	0	?	50
OC	210	141	320	260	12	12	680	8,200
QN	0	0	93	48	0	0	220	400

<sup>1</sup> It is necessary to bear in mind the distinction between sites that *regularly* hold wintering numbers of national/international importance and those which may happen to exceed the appropriate qualifying levels only in occasional winters. This follows the recommendations of the Ramsar Convention, which states that key sites are identified because they support such numbers on a regular basis (usually calculated as the mean winter maximum from the last five winters).

RH	2	0	1	1	0	0	*20(50)	2,600
RK	218	61	130	127	67	67	210	2,400
RM	2	0	24	7	0	0	*35(50)	1,700
RP	127	29	60	44	7	7	150	730
SA	30	15	45	18	3	3	?	2,000
SU	0	0	0	0	1	1	150	3,000
TT	206	79	155	100	106	106	120	1,400
WM	3	1	0	0	0	0	+	6,700

**Key to Table 6.7**

? Population size not accurately known

+ Population size too small for meaningful figure to be obtained

\* Where 1% of the British or all-Ireland wintering population is less than 50 birds, 50 is normally used as a minimum qualifying level for national or all-Ireland importance respectively

\*\* A site regularly holding more than 20,000 waterbirds qualifies as international importance by virtue of absolute numbers

**Mill Bay (01407)**

Mill Bay is a small, sheltered, intertidal inlet located towards the mouth of Carlingford Lough. The bay is fed by the White Water River and supports the largest remaining intact block of saltmarsh in Northern Ireland. The bays intertidal flats also support localised but frequent beds of dwarf eelgrass *Zostera noltii* and a rich intertidal invertebrate community. Together these provide an important foraging habitat for the Loughs overwintering bird populations, particularly Pale-bellied Brent Geese, Shelduck and Wigeon.

There are no foreseeable impacts on Mill Bay as a result of the proposed development but information on this site is presented as a comparative.

Table 6.8 lists bird species and peak counts recorded in Mill Bay (01407) during count years 2005/06 to 2009/10, along with 1% national (all-Ireland) and international threshold levels (Holt *et al.*, 2012). Tabulated five year summary datasets as received from BTO are provided in Appendix 6.2. A total of 41 bird species were recorded at Mill Bay between count years 2005/06 to 2009/10.

Mill Bay (01407) regularly supports national and internationally important numbers of the NI Carlingford Lough SPA overwintering Pale-bellied Brent Geese population during the winter (winter mean peak ~129% of 319 individuals; ~187% of the national threshold; ~103% of the international threshold). Autumn numbers of Red-breasted Merganser also regularly exceed that of the that of the ASSI population (autumn mean peak ~225% of 36 individuals). Mill Bay regularly supports notable proportions of the ASSI populations of Oystercatcher (autumn peak mean ~68% of 783 individuals), Dunlin (winter mean peak ~46% of 1,598 individuals; ~84% of the national threshold), Redshank (winter mean peak ~43% of 676 individuals; ~94% of the national threshold) and Shelduck (winter peak mean ~22% of 233 individuals).

The site also supports notable numbers of Curlew (winter peak mean ~60% of the national threshold) and it is also likely that winter counts regularly exceed the national threshold for Cormorant (winter mean peak of CA ~54% of national threshold; autumn peak mean of CA/SA ~ 148% of the national threshold).

**Table 6.8: Mill Bay (01407) BTO WeBS Peak Summary Data**

BTO Species Code	Autumn		Winter		Spring		1% of National	1% of International
	Max	Mean Peak	Max	Mean Peak	Max	Mean Peak		
BA	35	8	30	17	0	0	160	1,200
BH	3	1	62	21	0	0	?	**20,000
CA	58	37	325	76	0	0	140	1,200
CM	68	17	16	5	0	0	?	16,400
CU	490	326	472	331	165	165	550	8,400
DN	100	44	1200	740	0	0	880	13,300
ET	23	11	12	7	0	0	?	1,300
GA	0	0	2	0	0	0	20	600
GB	82	21	120	40	56	56	?	4,200
GG	2	1	2	1	0	0	50	3,500
GK	12	7	12	8	1	1	*20(50)	2,300
GN	0	0	40	22	0	0	95	11,400



BTO Species Code	Autumn		Winter		Spring		1% of National	1% of International
	Max	Mean Peak	Max	Mean Peak	Max	Mean Peak		
GP	70	32	30	6	80	80	1,700	9,300
GV	5	2	45	33	0	0	65	2,500
H.	34	26	12	8	1	1	30	2,700
HG	10	3	12	4	0	0	?	10,200
JS	0	0	1	0	0	0	250	20,000
KF	1	0	0	0	0	0	?	?
KN	0	0	21	9	0	0	190	4,500
L.	211	112	2000	873	0	0	2,100	**20,000
LG	1	0	2	1	0	0	25	3,900
LN	0	0	1	0	0	0	+	16,000
MA	109	62	69	59	4	4	380	**20,000
ND	0	0	15	4	0	0	?	50
OC	679	530	567	369	316	316	680	8,200
QN	264	103	602	412	150	150	220	400
PN	0	0	3	1	0	0	20	600
PO	0	0	1	0	0	0	400	3,000
RH	0	0	13	6	0	0	*20(50)	2,600
RK	318	242	405	292	13	13	210	2,400
RM	171	81	12	6	11	11	*35(50)	1,700
RP	192	82	106	54	4	4	150	730
SA	41	14	51	30	3	3	?	2,000
SN	1	0	5	2	0	0	?	**20,000
SP	0	0	35	7	0	0	*45(50)	3,100
SU	3	2	77	52	43	43	150	3,000
T.	8	2	10	5	3	3	450	5,000
TE	0	0	0	0	66	66	?	1,700
TT	85	45	147	80	23	23	120	1,400
WM	4	1	0	0	1	1	+	6,700
WN	80	29	206	126	1	1	820	15,000
CA/SA	295	208	200	132	0	0	140/?	1,200/2000

**Key to Table 6.8**  
 ? Population size not accurately known  
 + Population size too small for meaningful figure to be obtained  
 \* Where 1% of the British or all-Ireland wintering population is less than 50 birds, 50 is normally used as a minimum qualifying level for national or all-Ireland importance respectively.  
 \*\* A site regularly holding more than 20,000 waterbirds qualifies as international importance by virtue of absolute numbers.

### 6.2.6.2 BirdWatchIreland i-WeBS Data

The Irish Wetland Bird Survey (I-WeBS) is a joint survey scheme between BWI and NPWS, which aims to monitor wintering waterbirds in Ireland. The survey runs from September to March each winter, with over 800 wetland sites surveyed including estuaries, coastlines, bays, rivers, turloughs, lakes, streams and flooded fields.

A data request was submitted to BWI for the most recent 5-years i-WeBS counts completed at the following relevant sites within 2km of the project footprint:

- Greenore - Ballagan Point (0Z480) and;
- Carlingford - Greenore (0Z482).

At the time of request (January 2012) BWI held only one month of data for Greenore - Ballagan Point (0Z480) from 2009/10, all other datasets dated from prior to 2002/03 and were thus considered out-dated. Due to the more extensive coverage of the same Greenore to Ballagan site by BTO, only BTO WeBS data was therefore requested for use in this assessment.

### 6.2.6.3 BTO Little Ringed Plover & Ringed Plover Breeding Survey 2007

In 2007 the BTO undertook a UK-wide survey of breeding little Ringed Plover *Charadrius dubius* and Ringed Plover, which was the first national survey for these species since 1984 (Parringer, 1989; Prater, 1989). The aims of the survey were to:

- obtain updated population estimated for the two species within the UK;
- to investigate the species' current distribution and habitat associations and;
- to census all Sites of Special Scientific Interest (SSSIs) and Special Protection Areas (SPAs) designated for their importance for breeding Ringed Plovers.

For both species a set of 'core' survey tetrads (2 km x 2 km square) were identified based on their known occupation by the two species from 1984 to 2006. In addition a stratified selection of 'sample' tetrads were also covered to provide breeding population estimated of plovers away from these 'Core' sites. Survey details can be found at: <http://www.bto.org/survey/complete/ringedplovers/index.htm>.

A data request was submitted to the BTO to obtain any records for the 10km grid square J21. The BTO's search revealed there were three core tetrads identified for survey in J21 (Q, V, W), two sample tetrads (C & H) and one casual record (K). Core and sample tetrads were unfortunately not covered during the 2007 survey however, a single pair of Ringed Plovers were found in tetrad K (J210400)<sup>2</sup>.

### 6.2.6.4 RSPB Annual Reserves Count Data

The Carlingford Lough Islands RSPB Nature Reserve comprises Green Island, Blockhouse Island and the small nearshore islands at Greencastle Point (Figure 6.1). The RSPB are committed to monitoring breeding birds on their reserves each year in order to determine the progress of reserve management objectives and the success in conserving breeding species within their reserves. The annual reserve counts also contribute significantly to national monitoring schemes including the JNCC's Seabird Monitoring Programme (SMP).

On consultation with RSPB it was agreed that RPS would not undertake a breeding bird survey on the Carlingford Lough Islands, in order to prevent unnecessary disturbance to nesting birds (L. Peoples, *Pers Corrs*). Only roosting birds were counted on Green Island during the course of Wetland Bird Surveys. A data request was therefore submitted to RSPB for the most recent 10-years Annual Reserves Count Data for the Carlingford Lough Islands Reserve, after the 2012 breeding season.

Annual reserve counts for 2002-2012 are summarised in Table 6.9. Distinction was not made between the reserves islands in the obtained dataset, but it is assumed that Green Island supports the majority of breeding birds recorded. In 2012 Common, Arctic and Sandwich Terns nested almost exclusively on Green Island with only small numbers on the nearshore islands off Greencastle Point (N. Robinson, *Pers Obsvs*).

Up until 2006 the Carlingford Lough Islands RSPB Nature Reserve regularly supported the NI Carlingford Lough SPA nesting Common Tern (2002 ~236% of 339 pairs; 2003 ~150%; 2004 ~85%; 2005 ~101%; 2006 ~117%<sup>3</sup>) and Sandwich Tern (2002 ~159% of 575 pairs; 2003 67%; 2004 ~138%; 2005 ~196%; 2006 ~144%<sup>4</sup>) populations. The data sets show significant fluctuations of the Carlingford Lough nesting Tern populations (Common, Sandwich and Arctic) and small gulls (Black-headed and Common Gull) since 2000 and an increase in large predatory gulls (Great Black-backed and Herring Gull). In 2012 the Carlingford Lough Islands supported only 38% and 14% of the SPA populations of Common Tern and Sandwich Tern respectively.

**Table 6.9: Carlingford Lough Islands RSPB Annual Reserve Counts 2002-2012**

BTO Species Code	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
AE	27 (P)	23 (N)	58 (AON)	30 (AON)	35 (AON)	29 (AON)	0 (AON)	7 (AON)	46 (AON)	17 (AON)	15 (ANEST)
CN	459 (P)	510 (N)	289 (AON)	341 (AON)	398 (AON)	282 (AON)	0 (AON)	-	108 (AON)	69 (AON)	130 (ANEST)

<sup>2</sup> Tetrads are labelled as per BTO standard naming system (<http://www.bto.org/volunteer-surveys/birdatlas/taking-part/correct-grid-references>).

<sup>3</sup> Assumes N or AON constitutes a pair.

<sup>4</sup> Assumes N or AON constitutes a pair.

TE	917 (P)	387 (N)	795 (AON)	1125 (AON)	826 (AON)	363 (AON)	170 (AON)	-	-	-	78 (ANEST)
BH	19 (P)	28 (N)	14 (AON)	78 (AON)	33 (AON)	37 (AON)	0 (AON)	11 (AON)	-	-	-
CM	5 (P)	2 (N)	3 (AON)	4 (AON)	5 (AON)	8 (AON)	5 (AON)	-	2 (AON)	-	1 (ANEST)
GB	-	2 (N)	3 (AON)	18 (AON)	12 (AON)	4 (AON)	3 (AON)	1 (AON)	14 (AON)	12 (AON)	8 (ANEST)
HG	-	-	-	-	-	1 (AON)	-	-	-	1 (AON)	-
LB	-	-	-	-	-	-	-	-	1 (AON)	-	-
OC	13 (P)	18 (N)	12 (P)	7 (P)	12 (P)	14 (P)	0 (P)	2 (P)	7 (P)	10 (P)	9 (P)
RP	3 (P)	7 (N)	7 (P)	2 (P)	2 (P)	1 (P)	2 (P)	1 (P)	-	-	-

**Key to Table 6.9**

P - Pair; N - Nest; AON - Apparently Occupied Nest; ANEST - A nest

**6.2.6.5 Seabird Monitoring Programme Database**

The Seabird Monitoring Programme (SMP) is an ongoing annual monitoring programme, established in 1986, of 26 species of seabird that regularly breed in Britain and Ireland. It aims to ensure that sample data on breeding numbers and breeding success of seabirds are collected, both regionally and nationally, to enable their conservation status to be assessed.

The SMP is led and co-ordinated by JNCC in partnership with BWI, BTO, Centre for Ecology & Hydrology, Countryside Council for Wales, Department of Environment, Food and Agriculture (Isle of Man), DAHG, States of Guernsey Government, JNCC Support Co, Manx Birdlife, Manx National Heritage, The National Trust, The National Trust for Scotland, Natural England, NIEA, RSPB, The Seabird Group, Shetland Oil Terminal Environmental Advisory Group and the Scottish Wildlife Trust.

A request to use the SMP Dataset to assist in reporting on known seabird colonies in the Carlingford Ferry development area was submitted. All data were extracted from the Seabird Monitoring Programme Database [at [www.jncc.gov.uk/smp](http://www.jncc.gov.uk/smp) and/or [www.jncc.gov.uk/page-4460](http://www.jncc.gov.uk/page-4460)]. Data have been provided to the SMP by the generous contributions of nature conservation and research organisations, and of many volunteers throughout the British Isles.

Colony counts were available for the following sites:

- Green Island (Site Code: 83455);
- Blockhouse Island (Site Code: 83456);
- Carlingford Lough (Site Code: 100865);
- Carlingford Lough - Tysties (Site Code: 85034) and;
- Greenore Harbour (Site Code: 87331).

**Green Island (Site Code: 100865)**

The data request submitted to RSPB issued collated counts of the Carlingford Lough Island Reserve, which includes Green Island, Blockhouse Island and the nearshore islands off Greencastle Point. The SMP database was therefore consulted to obtain a breakdown of the dataset.

The SMP Database holds counts for Green Island from as early as 1994. Due to the volume of records only the most recent counts made from 2000 onwards are presented here. The full dataset can be viewed on the SMP Online Database at <http://jncc.defra.gov.uk/smp/Default.aspx>. The results are presented in Table 6.10.

This breakdown of datasets shows that in the most recent count years the NI Carlingford Lough SPA Tern colony have nested almost entirely on Green Island.

**Table 6.10: Green Island (Site Code: 100865)**

Country	County	Site	BTO Species Code	Sample Year						
				2000	2001	2003	2004	2005	2006	2007
Northern Ireland	Down	Green Island	CN	509	-	-	-	-	398	282
Northern Ireland	Down	Green Island	AE	3	-	-	-	-	35	29
Northern Ireland	Down	Green Island	BH	25	18	28	7	78	33	37
Northern Ireland	Down	Green Island	CM	1	1	2	-	4	5	8
Northern Ireland	Down	Green Island	GB	1	1	2	-	3	3	4
Northern Ireland	Down	Green Island	HG	-	-	-	-	-	-	1
Northern Ireland	Down	Green Island	TE	650	-	-	-	-	826	363

**Blockhouse Island (Site Code: 83456)**

The SMP Database holds counts for Block House Island from as early as 1994. Due to the volume of records only the most recent counts made from 2000 onwards are presented here. The full dataset can be viewed on the SMP Online Database. The results are presented in Table 6.11.

**Table 6.11: Block House Island (Site Code: 83456)**

Country	County	Site	Species	Sample Year			Count Unit
				2000	2005	2006	
Northern Ireland	Down	Blockhouse Island	GB	10	15	9	AON

**Key to Table 6.11**  
AON - Apparently Occupied Nest

There are no foreseeable impacts on Blockhouse Island as a result of the proposed development. Blockhouse Island is located approx 1.4km to the southeast of the preferred ferry route (Figure 6.1).

**Carlingford Lough - Tysties (Site Code: 85034)**

The SMP Database held the results of the SMP Tystie (Black Guillemot) Survey for Carlingford Lough - Tysties. On consultation JNCC confirmed that the 2000 count in Table 6.12 below represents a colony of Black Guillemots at Blockhouse Lighthouse (R. Mavor, *Pers Corrs*). Seven Black Guillemots were recorded at the site in 2000.

**Table 6.12: Carlingford Lough - Tysties (Site Code: 85034)**

Country	County	Site	Species	Sample Year	Count	Count Unit
Northern Ireland	Down	Greencastle	TY	2000	7	Individuals on Sea

There are no foreseeable impacts on Blockhouse Lighthouse as a result of the proposed development. Blockhouse Island is located c. 1.4km to the southeast of the preferred ferry route (Figure 6.1).

**Greenore Harbour (Site Code: 87331)**

The SMP Database held only the results of the SMP Tystie Survey for Greenore Harbour. The results are presented in Table 6.13. Six Black Guillemots were recorded at the site in 1998.

**Table 6.13 SMP Tystie Survey Results for Greenore 1998.**

Country	County	Site	Species	Sample Year	Count	Count Unit
Republic of Ireland	Louth	Greenore Harbour	TY	1998	6	Individuals on Sea

#### 6.2.6.6 Greenore Port Company Datasets

Datasets held by the Greenore Port Company relating to a Wetland Bird Study that was undertaken for the purpose of assessing the potential impact of the Greenore Port Development, were made available for the purposes of this assessment.

The study commissioned by the Greenore Port Company was undertaken over the 2010-11 wintering period to primarily assess the use of the outer section of the southern shore of Carlingford Lough between Greenore and Balaggan Point.

The survey area of the study comprised three zones:

- Zone 1 - Greenore to Balagan Point;
- Zone 2 - Carlingford to Greenore and;
- Zone 3 - The Northern Shore at Greencastle (Figure 6.3).

Summary datasets were available for Zones 1 and 2 at the time of request. Zone 1 was further subdivided into four subsections (Figure 6.4):

- Zone 1a - The shoreline between Greenore Port to the Panpak Ltd. warehouses;
- Zone 1b - The shoreline between the Panpak Ltd. Warehouses to the Open Hydro Warehouses;
- Zone 1c - The shoreline between the Open Hydro warehouses and Balynatrasna and;
- Zone 1d - The shoreline between Balynatrasna and Balagan Point.

Subsection 1d was often extended south beyond Ballagan Point.

The study commenced in October 2010 with approximately fortnightly bird counts made within each Zone until April 2011. Counts covered a range of tidal states, tidal heights and lunar states. Peak counts of waterbirds recorded during the study are presented in Table 6.14.

#### Zone 1a

Zone 1a overlaps with Count Sections 1.2 and 1.3 of the RPS Wetland Bird Survey. Counts in Zone 1a recorded the lowest peak counts of birds relative to Zone 1b, 1c, 1d and Zone 2. The peak count of Pale-bellied Brent Geese was 35 (~14% of the ROI SPA population of 253 individuals) but it is known that Brent Geese were rarely recorded within Zone 1a throughout the duration of the 2010-11 study (mean = 1; N. Robinson, *Pers Obsvs*). The southern extent of Zone 1a is located approx 800m from the proposed Greenore footprint.

#### Zone 1b

The southern boundary of Zone 1b is located approx 900m from the proposed Greenore footprint. Counts of birds in Zone 1b can be seen to be marginally higher than those recorded in Zone 1a but remain significantly lower than those in Zone 1c, 1d and Zone 2. The peak count of Pale-bellied Brent Geese recorded was 46 (18% of ROI SPA population), but similarly to Zone 1a it is known that Brent Geese were infrequently recorded within Zone 1b throughout the duration of the 2010-11 study (mean = 1; N. Robinson, *Pers Obsvs*).

#### Zone 1c

The southern boundary of Zone 1c is located approx 1.8km from the proposed Greenore footprint. Peak counts of birds in Zone 1c were consistently found to be higher than those recorded in Zone 1a and 1b. The peak count of Pale-bellied Brent Geese was 195 (~77% of the ROI SPA population, mean = 12). Peak counts of Curlew, Dunlin, Lapwing, Oystercatcher, Redshank, Ringed Plover and Turnstone were also found to be consistently higher than those recorded in Zone 1a and 1b.

A regular wader roost was located along the boundary of Zone 1c and 1d, largely comprising Oystercatcher (N. Robinson, *Pers Obsvs*).

Zone 1d

The southern boundary of Zone 1d is located approx 4km from the proposed Greenore footprint. The peak count of Pale-bellied Brent Geese of 501 (~13% of the ROI SPA; mean = 34) was the highest recorded in any Zone. Similarly the peak counts of Great Black-backed Gull, Lapwing, Black-tailed Godwit, Red-throated Diver, Red-breasted Merganser, Great Crested Grebe, Turnstone and Whooper Swan and Mallard were also recorded in Zone 1d. The numbers of waterbirds clearly increasing with increasing distance from Greenore Port and increasing extent of intertidal flats exposed at low tide.

Zone 2

Zone 2 overlaps with Count Sections 1.1, 1.2 and 1.4 of RPS Wetland Bird Survey, with the western boundary of Zone 2 is located approximately 60m to the west of the proposed Greenore footprint. This Zone comprises extensive areas of intertidal flats adjacent to the Greenore Golf Course and along the R176 to Carlingford. The peak count of Pale-bellied Brent Goose was 412 (mean of 136 ~54% of the ROI SPA), comparable to that of 1d. Peak counts of Bar-tailed Godwit, Common Gull, Curlew, Dunlin, Little Egret, Greenshank, Golden Plover, Herring Gull, Knot, Great Northern Diver, Oystercatcher, Redshank, Ringed Plover, Teal and Wigeon were also recorded in Zone 2.

Small numbers of Pale-bellied Brent Geese occasionally roosted on rocky outcrops within the most north easterly portion of this count zone, closest to Carlingford (N. Robinson, *Pers Obs*).

**Table 6.14: Greenore Port Company Wetland Bird Survey Count Summary**

BTO Species Code	1A		1B		1C		1D		2		1% National	1% International
	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean		
BA	1	0	0	0	32	0	22	0	66	9	160	1,200
BH	2	0	4	0	25	1	200	17	520	51	?	**20,000
BW	0	0	0	0	1	0	15	0	7	0	140	610
CA	10	1	3	0	26	1	20	1	28	4	140	1,200
CM	8	0	4	0	41	4	205	22	270	55	?	16,400
CU	1	0	11	0	28	3	79	6	110	21	550	8,400
DN	7	0	13	0	130	6	220	13	300	45	880	13,300
ET	0	0	0	0	6	0	1	0	35	1	?	1,300
GB	5	0	1	0	5	0	38	2	9	2	?	4,200
GG	1	0	3	0	4	0	4	0	3	0	50	3,500
GK	1	0	0	0	2	0	0	0	32	3	*20	2,300
GP	0	0	0	0	2	0	4	0	67	4	1,700	9,300
GU	2	0	1	0	0	0	0	0	0	0	N/A	N/A
GV	1	0	1	0	3	0	6	0	2	0	65	2,500
H.	1	0	1	0	4	0	9	0	5	1	30	2,700
HG	5	0	4	0	7	1	50	5	60	10	?	10,200
KN	0	0	0	0	0	0	7	0	26	2	190	4,500
L.	0	0	2	0	30	1	129	5	100	8	2,100	**20,000
LB	3	0	2	0	3	0	3	0	2	0	?	5,500
MA	1	0	1	0	2	0	62	1	61	6	380	**20,000
ND	2	0	3	0	2	0	9	0	13	0	?	50
OC	12	1	19	1	85	17	96	13	193	51	680	8,200
QN	35	1	46	1	195	12	501	34	412	136	220	400
RA	1	0	2	0	0	0	0	0	0	0	N/A	N/A
RH	1	0	0	0	2	0	33	0	0	0	*20	2,600
RK	1	0	15	0	55	6	155	19	410	64	310	2,400
RM	2	0	0	0	12	0	14	0	12	1	*35	1,700
RP	5	0	1	0	18	0	27	2	73	9	150	730
SA	1	0	2	0	1	0	2	0	13	0	?	2,000

BTO Species Code	1A		1B		1C		1D		2		1% National	1% International
	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean		
SP	1	0	0	0	0	0	3	0	0	0	*45	3,100
SU	1	0	0	0	2	0	4	0	7	1	150	3,000
T.	0	0	0	0	0	0	22	0	60	3	450	5,000
TT	2	0	2	0	21	1	77	8	54	9	120	1,400
TY	4	0	2	0	0	0	5	0	11	1	N/A	N/A
WN	0	0	0	0	2	0	1	0	180	42	820	15,000
WS	0	0	0	0	1	0	8	0	3	0	130	270

**Key to Table 6.14**

? Population size not accurately known

\* Where 1% of the British or all-Ireland wintering population is less than 50 birds, 50 is normally used as a minimum qualifying level for national or all-Ireland importance respectively

\*\* A site regularly holding more than 20,000 waterbirds qualifies as international importance by virtue of absolute numbers

**6.2.7 Field Survey Results**

This section presents the results of the following field surveys undertaken by RPS during 2011 and 2012:

- Terrestrial Breeding Bird Survey (2012);
- Breeding Black Guillemot Survey (2012);
- Breeding Ringed Plover Survey (2012);
- Wetland Bird Survey Counts with Through the Tidal Cycle Counts (2011-2012).

**6.2.7.1 Terrestrial Breeding Bird Survey**

The survey area was visited on two occasions between April and May 2012. All visits were made in good survey conditions (i.e. they were not made in strong winds, during persistent/heavy rain or poor visibility) between 06h00 and 12h00. Survey conditions are presented in Table 6.15.

**Table 6.15: Terrestrial Breeding Bird Survey Survey Conditions**

Date	Site	Start Time	End Time	Survey Conditions
27/04/2012	Greenore	06h15	07h15	Wind: F1-2 (NW), Precipitation: NIL, Cloud: 4/8, Visibility: >3km
21/05/2012	Greenore	09h30	10h00	Wind: F0-1 (S/SE), Rain: NIL, Cloud: 2/8, Visibility: >3km
01/05/2012	Greencastle & Greencastle Pier Road	07h30	08h30	Wind: F1-2 (NW), Precipitation: NIL, Cloud: 6/8, Visibility: >3km
21/05/2012	Greencastle & Greencastle Pier Road	06h15	07h15	Wind: F0-1 (S/SE), Rain: NIL, Cloud: 2/8, Visibility: >3km

All bird species encountered within the survey area were recorded, including those in flight over the survey area. A full list of bird species recorded is provided in Table 6.16. In total 21 species of bird were recorded during the survey effort.

The breeding status of all species encountered during survey were classified into four categories: Confirmed (Br), Probable (Pr), Possible (Po) and Non-breeder (N), based on BTO 'Categories of Breeding Evidence':

**Non-breeder**

- Flying Over (F)
- Migrant (M)
- Summering non-breeder (U)

**Possible breeder**

- Observed in suitable nesting habitat (H)
- Singing Male (S)

**Probable breeder**

- Pair in suitable nesting habitat (P)
- Permanent Territory (T)
- Courtship and Display (D)

- Visiting probable nest site (N)
- Agitated Behaviour (A)
- Brood patch of incubating bird (I)
- Nest Building or excavating nest-hole (B)

**Confirmed breeder**

- Distraction-display or injury feigning (DD)
- Used nest or eggshells found from current season (UN)
- Recently fledged young or downy young (FL)
- Adults entering or leaving nest-site indicating occupied nest (ON)
- Adult carrying faecal sac or food for young (FF)
- Nest containing eggs (NE)
- Nest with young seen or heard (NY)

Only the highest level of breeding evidence recorded is given in Table 6.16.

**Habitats for Breeding Birds**

The proposed Greencastle footprint comprises a single improved agricultural field with a vegetated derelict stone wall boundary. Private dwellings and gardens lie to the east and west of the field, Greencastle Pier Road to the north and the Greencastle shingle shoreline to the south.

Roadside boundaries along the Greencastle Pier Road largely comprise stone walls (often well vegetation with agricultural grasses, gorse and ivy), defunct gorse/hawthorn hedgerows and Sycamore *Acer pseudoplatanus* and Ash *Fraxinus excelsior* tree lines. A number of derelict buildings are also located along the road boundary.

The proposed Greenore footprint is located largely within the existing Greenore Port. The landtake comprised hardstanding, the security gatelodge, an old concrete store and rock armour. The hardstanding within Greenore Port is heavily recolonised in parts.

**Table 6.16: Birds Species Recorded During Terrestrial Breeding Bird Surveys**

BTO Species Code	Breeding Status	No. of Territories (within landtake)	Conservation Status	Notes
B.	A	4	-	Within scrub and hedgerow field boundaries along the Greencastle Pier Road
CH	A	3	-	Within hedgerows along the Greencastle Pier Road.
CM	F	0	Amber	Single birds noted flying over the survey area and foraging within improved grassland and arable fields along the Greencastle Pier Road. Nests locally on Green Island and the nearshore islands off Greencastle Point.
D.	N	1	NI, UKBAP	Within hedgerows along the Greencastle Pier Road.
GO	F	0	-	Flying over survey area.
GT	P	3	-	Within mature trees and hedgerows along the Greencastle Pier Road.
GR	S	1	-	Within a residential garden to the east of the Greencastle footprint.
HM	ON	4	Amber	Several nests on dwellings and farm buildings along Greencastle Pier Road, with approx 4 on a dwelling immediately to the east of the Greencastle land take .
HS	N	3	NI, UKBAP	A small number of pairs nesting within farm buildings along Greencastle Pier Road and within approx 3 pairs nesting within disused concrete store at Greenore Port .
JD	N	3	-	A small number of pairs nesting within farm buildings, mature trees and chimneys along Greencastle Pier Road.
MG	N	3	-	Nesting within mature trees along Greencastle Pier Road.
PW	P	2	-	Nesting within crevices at Greencastle (1 pair) and Greenore (1 pair).
R.	S	2	-	Nesting within scrub and hedgerows at Greenore and



BTO Species Code	Breeding Status	No. of Territories (within landtake)	Conservation Status	Notes
				Greencastle and along the Greencastle Pier Road.
RO	F	-	-	Flying over survey area.
SW	S	2	-	A limited number of territories within scrub at wet field boundaries along Greencastle Pier Road.
ST	T	2	NI	Within hedgerows and treelines along Greencastle Pier Road.
SG	ON	1 (within project landtake)	NI, UKBAP	A small number of pairs nesting within farm buildings along Greencastle Pier Road and within a disused crane at Greenore Port. An old potential nest located during bat surveys within roof void of Security Gate Lodge.
SL	N	4	Amber	Nesting within the old concrete store at Greenore with several additional pairs nesting within farm buildings along the Greencastle Pier Road.
SI	F	-	Amber, NI	Small numbers noted foraging over Greenore Port.
WP	P	2	-	Nesting/Roosting within mature trees along Greencastle Pier Road.
WR	T	6	-	Numerous pairs nesting within scrub and hedgerows at Greenore along the Greencastle Pier Road.
<b>Key to Table 6.16</b> WO S1 – Species listed on Schedule 1 of the Wildlife (NI) Order Amber – Amber-listed BOCCI NI – Northern Ireland Priority Species UKBAP – Species has a UK Biodiversity Action Plan				

There were a number of other species which were not recorded during the 2012 Terrestrial Breeding Bird Survey effort but which were recorded during additional RPS field surveys and may breed within the survey area in some years or within the wider Greencastle and Greenore environs including - Merlin *Falco columbarius*, Peregrine *Falco peregrinus*, Cuckoo *Cuculus canorus*, Skylark *Alauda arvensis*, Meadow Pipit *Anthus pratensis*, Rock Pipit *Anthus petrosus*, Sand Martin *Riparia riparis*, Stonechat *Sxicola rubicola*, Wheatear *Oenanthe oenanthe*, Willow Warbler *Phylloscopus trochilus*, Linnet *Carduelis cannabina*, Lesser Redpoll *Carduelis flammea cabaret* and Long-tailed Tit *Aegithalos caudatus*.

#### 6.2.7.2 Breeding Black Guillemot Survey

The Greenore and Greencastle survey results are illustrated in Figures 6.5 and 6.6. Table 6.17 and 6.19 present breeding population results for Greenore and Greencastle Respectively. The count units are *Adults associated with a colony*.

#### Greenore

The Greenore survey area was visited twice between April and early-May to undertake a population survey. Suitable nesting habitat was considered to be largely restricted to the Greenore breakwater (Plate 6A), the Greenore Port quay wall and rock armour (Plate 6B-D).

Counts consistently recorded 22 birds associating with the colony, with only two birds in non-breeding plumage. A peak count of 25 black guillemots was however subsequently recorded during boat based survey work in late May 2012, with five birds in non-breeding plumage. Mating and displaying was recorded amongst the majority of adult birds suggesting 10 breeding pairs.

The Greenore Breakwater currently provides three purpose built nesting tunnels for black guillemots (Plate 6E). Observations of leaving and arriving adults in early-May confirmed all boxes were occupied in 2012. In addition three pairs were noted entering and leaving drainage pipes on the main quay wall (Plate 6F), and two pairs entering and leaving a disused crane within the main port (Plate 6G). This suggested a total of eight occupied nests in May.

The survey area was re-visited in late-June and late-July to determine successful nests. Only pairs occupying nesting tunnels on the breakwater and one on the disused crane remained active in June and only those on the breakwater remained active in July. It was unsurprising those on the main quay wall failed due to water flow from the drainage pipes and restricted access whilst cargo ships were berthed. Sites in the crane could not be inspected but jackdaws were observed entering potential nesting-sites suggesting predation or disturbance of these nest sites.

**Table 6.17: Black Guillemot Breeding Population Survey at Greenore**

Date	Adults Associated with Colony	Adults in Non-Breeding Plumage	Adults >300m from Colony Site
27/04/2012	20	2	0
03/05/2012	20	2	0
Peak	20 (10 pairs)	0	0

Table 6.15 presents the results for breeding productivity at Greenore. Productivity ( $p$ ) is calculated as:

$$p = \text{no. successful sites in July} / \text{no. of occupied sites in May.}$$

**Table 6.18: Black Guillemot Productivity at Greenore**

Colony Location	Successful Nest (July)	Occupied Nests (May)	$p$
Greenore	3	8	0.375

There has been a significant increase in the Greenore Black Guillemot colony since Seabird 2000, with only six individuals recorded during the survey in 1998. The installation of nesting tunnels in 2007<sup>5</sup> has likely contributed to the provision of undisturbed nesting opportunities and increased productivity but the colony still appears to be limited by the availability of nesting sites.

### Greencastle

The Greencastle survey area was visited twice in early-May to undertake a colony population survey. Suitable nesting habitat was considered to be largely restricted to the wooden and stone Greencastle Piers, Greencastle Dock and a navigation beacon to the southwest of the survey area.

During 2012 birds were not found to associate with obvious nesting habitat, but with one of two tug boats moored in the shallow waters adjacent to the development (Plate 6H & I). A peak of seven adult birds were associated with the tug boat in early-May, with mating and displaying noted between three discrete pairs. Observations of adults arriving and leaving the tug boat in early-May also suggested three nest-sites were present, but these could not be confirmed.

The survey area was re-visited in late-June and late-July to determine successful nests. Whilst birds remained in the vicinity of Greencastle there was no evidence that potential nests on the tug boat remained active. Table 6.20 presents the results for breeding productivity at Greencastle.

**Table 6.19: Black Guillemot Breeding Population Survey at Greencastle**

Date	Adults Associated with Colony	Adults in Non-Breeding Plumage	Adults >300m from Colony Site
01/05/2012	6	0	1
03/05/2012	7	0	0
Peak	7 (3 Pairs)	0	0

**Table 6.20: Black Guillemot Productivity at Greencastle**

Colony Location	Successful Nest (July)	Occupied Nests (May)	$p$
Greencastle	0	3	0

The Greencastle colony was not recorded during Seabird 2000 however, anecdotal information suggests the birds have been here for a number of recent years. Colony growth is likely hindered by the availability of undisturbed nesting sites however, Black Guillemots have been known to successfully fledge young from working tug boats in Belfast Lough.

<sup>5</sup> A joint project by BirdWatch Ireland Louth, Greenore Port Company and Bush Post-Primary School.

### Additional Black Guillemot Observations

A peak count of 13 adult Black Guillemots were recorded at the Blockhouse Lighthouse colony on 27th April 2012 during boat-based surveys. This shows an increase of six birds since Seabird 2000. Adults were noted entering and leaving several holes in the top of the lighthouse throughout April - July. Two Shag nests were also noted on window ledges of the lighthouse.

Blockhouse lighthouse is located over 1km from the proposed Greencastle footprint and ferry route, and will not be impacted by the development.

#### 6.2.7.3 Breeding Ringed Plover Survey

Three visits were made to the Greencastle and Greenore survey areas on the 21<sup>st</sup> May, 28<sup>th</sup> May and 26<sup>th</sup> June. Survey conditions are provided in Table 6.21. Suitable nesting habitat (sand/shingle beach) was only present to the south of the Greenore footprint and thus surveys were concentrated here (Plate 6J). Suitable nesting habitat (sand/shingle beach) extended both to the northwest and southeast of the Greencastle footprint (Plate 6K). Suitable habitat also exists on Green Island and the nearshore islands off Greencastle Point. These islands were not visited for the purposes of this survey (as agreed with RSPB) but viewed from the Greencastle shoreline.

No Ringed Plovers were recorded along the shorelines within 400m of each footprint. A single pair of Ringed Plovers was however, known to nest on the nearshore islands off Greencastle Point c.700m northwest of the Greencastle footprint. This site is located within the RSPB Carlingford Lough Islands Reserve and was therefore not surveyed in full accordance with recommended guidance (Bibby *et al.*, 1992 & Gilbert *et al.*, 1998) but viewed at a distance from the Greencastle shoreline.

Regular inundation of suitable nesting habitat and existing disturbance from boatmen, fishermen, beach walkers, dogs, is frequent along both shorelines and is likely to be deterring nesting pairs.

**Table 6.21: Ringed Plover Survey Conditions (2012)**

Date	Site	Start Time	End Time	Survey Conditions
21/05/2012	Greencastle	07h30	09h30	Wind: F0-1 (S/SE), Rain: NIL, Cloud: 2/8, Visibility: >3km
	Greenore	10h00	11h04	Wind: F0-1 (S/SE), Rain: NIL, Cloud: 2/8, Visibility: >3km
28/05/2012	Greenore	09h45	10h05	Wind: F0-2 (SE), Rain: NIL, Cloud: 0/8, Visibility: >3km
	Greencastle	11h00	11h10	Wind: F0-2 (SE), Rain: NIL, Cloud: 0/8, Visibility: >3km
26/06/2012	Greencastle	08h30	09h00	Wind: F1-2 (SE), Rain: NIL, Cloud: 4/8, Visibility: >3km
	Greenore	10h15	10h30	Wind: F1-2 (SE), Rain: NIL, Cloud: 4/8, Visibility: >3km

#### 6.2.7.4 RPS Wetland Bird Survey

This section should be read with reference to Figure 6.2. Bi-monthly point counts were undertaken over 12 months between November 2011 and October 2012. TTTCCs were undertaken over 7 months between October 2011 and March 2012, and during September 2012. Survey conditions are presented in Appendix 6.4. A total of 28 bird species including Auks, Gulls, Terns, Herons, Waders, Seaducks, Waterfowl, Divers, Grebes and Skuas were recorded during the survey effort.

Table 6.22 presents peak counts for Count Sections 1.1-1.4 and 2.1-2.5. Peak counts presented for Count Sections 1.1-1.4 and 2.1-2.3, comprise the results of both bi-monthly point counts and TTTCCs. Peak counts presented for Count Sections 2.4 and 2.5, comprise the results of bi-monthly point counts only. For Count Section 2.4 counts for Cormorant and Shag are combined (CA/SA). This is due to counts of Green Islands generally being made >200m away using binoculars to prevent disturbance to roosting birds.

Table 6.23 presents peak counts of birds recorded along each of the preliminary route options. As previously detailed only the route option which passes to the south of Green Island is considered in the final project concept.

Appendix 6.5 provides a breakdown of counts into three counting seasons consistent with those used by BTO WeBS: Autumn (July to October - Autumn Passage); Winter (November to March - Wintering Population) and Spring (April to June - Spring Passage) for comparison.

**Table 6.22: Wetland Bird Survey Count Sections 1.1-1.4 and 2.1-2.5 Peak Counts**

BTO Species Code	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	Conservation Status	Designated Site Feature
BA	0	0	0	0	0	8	33	20	0	Annex 1, Amber	
BH	1	2	4	2	6	15	28	0	0	Red (Breeding), NI	
BV	0	0	0	0	0	0	1	0	0	Annex 1, Amber, NI, UKBAP	
BW	0	0	0	0	0	0	1	0	0	WO S1, Amber, NI, UKBAP	
CA	2	2	4	19	1	1	3	-	0	Amber	NI IBA
CM	2	3	9	3	12	7	19	3	4	Amber	
CN	0	4	0	1	0	0	0	-	-	Annex 1, WO S1, Amber	NI, ASSI, Ramsar, NI IBA
CS	0	1	0	1	0	0	0	0	0	Amber	
CU	1	0	3	1	17	65	48	3	4	WO S1, Red (Breeding), NI, UKBAP	
DN	0	0	0	1	0	2	45	0	0	Annex 1, WO S1, Amber, NI	ASSI
GB	1	1	3	3	2	4	4	130	7	Amber	
GG	0	0	0	0	1	0	0	0	0	Amber	ASSI, NI IBA
GK	0	0	0	2	0	1	1	0	0	WO S1, Amber	
GU	1	3	4	0	1	2	0	0	0	Amber	
GV	0	0	0	0	0	1	1	0	0	Amber	
GX	0	0	0	0	0	1	0	0	0	Amber	
GZ	0	0	0	0	0	1	0	0	0		
H.	2	1	1	1	2	2	1	3	2	WO S1	
HG	3	2	8	8	7	50	16	21	10	Red (Breeding), NI, UKBAP	
L.	0	0	0	0	12	80	40	120	139	WO S1, Red (Breeding), NI, UKBAP	
LB	0	0	0	0	0	0	0	1	0	Amber	
MA	5	0	0	0	0	0	0	0	25		
ND	1	0	0	0	1	0	1	0	0	Annex 1	
OC	2	6	21	15	10	47	52	59	44	Amber	ASSI
QN	0	0	12	0	7	21	47	22	0	Amber, NI	NI, ASSI, Ramsar, ROI, NI INA, ROI IBA
RA	2	4	7	0	0	0	0	0	0	Amber	
RH	0	0	1	0	0	0	0	0	0	Annex 1, WO S1, Amber	
RK	0	1	9	170	2	25	25	20	2	WO S1, Red (Breeding), NI	ASSI, NI IBA
RM	0	0	0	0	0	0	3	0	0		ASSI, NI IBA
RP	1	9	5	0	0	18	33	0	4	Amber	

SA	2	6	4	37	2	4	4	-	0	Amber	
SU	0	6	9	0	0	0	2	0	0	Amber	ASSI
TE	0	21	4	0	0	3	27	-	-	Annex 1, WO S1, Amber	NI, ASSI, Ramsar, NI IBA
TL	1	0	0	0	0	0	0	0	0	Annex 1, Amber	
TT	0	0	0	31	1	3	5	40	11		
TY	21	16	4	23	1	9	2	0	0	Amber	
CA/SA	-	-	-	-	-	-	-	285	-		

**Key to Table 6.22**

Annex 1 - Listed on Annex 1 of The Birds Directive  
 WO S1 - Listed on Schedule 1 of the NI Wildlife Order  
 Red - Red-listed Bird of Conservation Concern in Ireland (BOCCI)  
 Amber - Amber-listed BOCCI  
 NI - Northern Ireland Priority Species  
 UKBAP - UK Biodiversity Action Plan Species  
 NI - NI Carlingford Lough SPA  
 ASSI - Carlingford Lough ASSI  
 Ramsar - Carlingford Lough Ramsar Site  
 ROI - ROI Carlingford Lough SPA  
 NI IBA - NI Carlingford Lough IBA  
 ROI IBA - ROI Carlingford Lough IBA

**Table 6.23: Wetland Bird Survey Preliminary Route Options Peak Counts**

BTO Species Code	Northern Option	Southern Option	Conservation Status	Designated Site Feature
AC	0	2	NI, UKBAP	
AE	1	0	Annex 1, WO S1, Amber	ASSI, Ramsar
BH	5	4	Red (Breeding), NI	
CA	24	5	Amber	NI IBA
CM	2	3	Amber	
CN	3	7	Annex 1, WO S1, Amber	SPA, ASSI, Ramsar, NI IBA
GB	7	5	Amber	
GU	5	6	Amber	
GX	1	0	Amber	
HG	3	2	Red (Breeding), NI, UKBAP	
LB	0	1	Amber	
ND	5	14	Annex 1	
RA	65	8	Amber	
RH	2	0	Annex 1, WO S1, Amber	
RM	0	4		
SA	25	30	Amber	
TE	16	4	Annex 1, WO S1, Amber	SPA, ASSI, Ramsar, NI IBA
TY	10	14	Amber	

**Key to Table 6.23**  
Annex 1 - Listed on Annex 1 of The Birds Directive  
WO S1 - Listed on Schedule 1 of the NI Wildlife Order  
Red - Red-listed Bird of Conservation Concern in Ireland (BOCCI)  
Amber - Amber-listed BOCCI  
NI - Northern Ireland Priority Species  
UKBAP - UK Biodiversity Action Plan Species  
NI - NI Carlingford Lough SPA  
ASSI - Carlingford Lough ASSI  
Ramsar - Carlingford Lough Ramsar Site  
ROI - ROI Carlingford Lough SPA  
NI IBA - NI Carlingford Lough IBA  
ROI IBA - ROI Carlingford Lough IBA

#### 6.2.7.4.1 Analysis of Results by Count Section

This section details wetland bird usage of individual count sections and should be read with reference to Figure 6.2, Appendix 6.4 and 6.5.

#### Greenore

Count Sections 1.1, 1.3 and 1.4 will not be directly impacted by the proposed Ferry project as the development footprint lies entirely within Section 1.2. Bird usage of these areas could however be indirectly impacted as a result of changes in coastal processes (impairing food resources), elevated noise and visual disturbance.

A total of 20 bird species were recorded within the Greenore survey area (Count Sections 1.1-1.4) including:

- 2 species listed on Annex 1 of The Birds Directive;
- 4 Red-listed (Breeding) BOCCIs;
- 13 Amber-listed BOCCIs and;
- 6 Northern Ireland Priority Species.

#### Section 1.1 South West Greenore Shoreline

Very few birds were recorded within Count Section 1.1. Pale-bellied Brent Geese were not recorded. Black Guillemots associated within the Greenore Port colony were the only species recorded within numbers of significance, with a peak count of 21 birds recorded on 21<sup>st</sup> May 2012. Black Guillemots primarily used the count section for displaying, with only a few individuals recorded foraging.

No significant high-tide roosts were recorded within the count section due to the lack of un-submerged habitats at high tide. Counts from the Greenore Breakwater are reported separately. Grey Heron was the only bird recorded roosting close in to the Greenore Port Quay wall, with a peak count of 2 birds recorded. The Greenore Port quay wall extends throughout much of the count section however, port activities were rarely undertaken within this count section. Activities were mainly concentrated in Count Section 1.2 where cargo vessels are berthed.

The number and range of foraging birds within the count section was limited to a small number of shorebirds and waterfowl including Mallard (peak of 5), Oystercatcher (2), Ringed Plover (1), Bar-tailed Godwit (1) and Curlew (1). Foraging birds were restricted to the most south-westerly extent of the count section corresponding to the exposure of intertidal flats. A single Great Northern Diver was also recorded foraging in waters beyond the breakwater on the 16th January 2012 and a peak count of two Razorbill were recorded foraging in December 2011 and February 2012.

Small numbers of birds occasionally loafed within the count section before moving to the Breakwater to roost including Common Gull (peak of 2), Great Black-backed Gull (1), Herring Gull (3), Shag (2) and Cormorant (2).

A single Leach's Petrel was also recorded on 10th September 2012, an apparent rarity within Carlingford Lough.

#### Section 1.2 Greenore Development Area

Very few birds were recorded within Count Section 1.2, which includes the proposed Greenore development footprint and a 250m buffer either side. The most frequently recorded species included Black Guillemots associated with the Greenore Port colony, with a peak counts of 16 birds recorded on the 28th February 2012. Black Guillemots primarily used the count section for displaying with only a few birds recorded foraging. Small numbers of Ringed Plover infrequently roosted on the shingle to the south east of Greenore Port (peak of 9) along with small numbers of Oystercatcher (6) and Grey Heron (1). No roosting birds were located along the rock armour within this count section.

Pale-bellied Brent Geese were not recorded however, a peak count of 21 Sandwich Tern (~4% of NI SPA population) were recorded foraging in the count section on 17<sup>th</sup> August along with a peak count of 4 Common Tern (~1% of NI SPA population). Prey species caught on this occasion appeared to be clupeid fry.

Additional foraging species were limited to small numbers of Cormorant (peak of 2), Common Guillemot (3), Razorbill (4), Redshank (1) and Shag (6).

Small numbers of birds occasionally loafed including Black-headed Gull (peak of 2), Common Gull (3), Great Black-backed Gull (1), Herring Gull (2) and Shelduck (6).

A single Common Sandpiper was recorded on 25th June 2012.

#### Section 1.3 South East Greenore Shoreline

A total of 18 bird species were recorded within Count Section 1.3 however only a marginal increase in actual bird numbers was recorded relative to Count Section 1.1. and 1.2. Oystercatcher were more prevalent, foraging over the rough parking area and intertidal flats where exposed in the most southerly extent of the count section (peak of 21). No regular high tide roosts were located along the shingle shoreline within this section.

A peak count of 12 Pale-bellied Brent Geese (~5% of ROI SPA population) were recorded foraging within the section on 28<sup>th</sup> February 2012. This was the only occasion on which the species was recorded within the Greenore survey area. Sandwich Tern were recorded foraging on two occasions, 14<sup>th</sup> August 2012 (peak of 4) and 17<sup>th</sup> August 2012 (count of 1).

Additional foraging species included Black-headed Gull (peak of 4), Cormorant (4), Common Gull (9), Curlew (3), Great Black-backed Gull (1), Grey Heron (1), Herring Gull (4), Razorbill (7), Red-throated Diver (1), Redshank (9), Ringed Plover (5), Shag (4) and Turnstone (9). Black Guillemots associated with the Greenore Port colony were least prevalent within this count section (4).



### Section 1.4 Greenore Breakwater

The Greenore Breakwater is a regularly used roosting location for wintering and non-breeding birds throughout the tidal cycle. A total of 16 bird species were recorded roosting on the Greenore Breakwater, but is considered to be of most importance for wintering and non-breeding Shag and Cormorant (peak of 39 and 19 respectively). Peak roosting Redshank in November (170) and also in February (92) were uncommon, with birds choosing the most westerly extent of the breakwater on which to roost and remaining relatively undisturbed by existing port operations.

### **Greencastle**

Sections 2.1, 2.3, 2.4 and 2.5 will not be directly impacted by the proposed development as the footprint lies entirely within Section 2.2. Bird usage of these areas could however be potentially indirectly impacted as a result of changes to coastal processes (impairing food resources), elevated noise and visual disturbance.

A total of 36 bird species were recorded within the Greencastle survey area including:

- 7 species listed on Annex 1 of The Birds Directive;
- 5 Red-listed (Breeding) BOCCI;
- 1 Red-listed (Wintering) BOCCI;
- 22 Amber-listed BOCCI and;
- 11 Northern Ireland Priority Species.

### Section 2.1 North West Greencastle Shoreline

A total of 18 bird species were recorded within Count Section 2.1. No significant roosting locations were recorded within only small numbers of Redshank, Oystercatcher, Grey Heron, Redshank and Curlew occasionally roosting (often as singletons) on exposed rocky outcrops between Greencastle Point and the Greencastle Pier. Foraging birds within the intertidal and sub-tidal zones typically comprised small numbers of Bar-tailed Godwit (peak of 6), Common Gull (12), Curlew (17), Herring Gull (3), Lapwing (12), Oystercatcher (10), Cormorant (1), Greater Black-backed Gull (2), Common Guillemot (1), Black-headed Gull (6), Redshank (2), Turnstone (1). Great Northern Divers, Shag and Great Crested Grebe were rarities within the sub-tidal zone (peak of 1).

Pale-bellied Brent Geese were recorded within the Count Section on three occasions: 05<sup>th</sup> December 2011 (count of 3 ~<1% of NI SPA population); 28<sup>th</sup> February 2012 (count of 5 ~2%) and 20<sup>th</sup> September 2012 (count of 7 ~2%) totalling 15 birds (~5%).

### Section 2.2 Greencastle Development Area

23 bird species were recorded within Count Section 2.2 with the intertidal and sub-tidal zone foraged by Bar-tailed Godwit (peak of 8), Oystercatcher (46), Black-headed Gull (15), Herring Gull (50), Common Gull (7), Curlew (65), Lapwing (80) Redshank (25), Ringed Plover (18), Turnstone (3), Common Guillemot (2) and Shag (2). No regular high tide roosts were recorded.

Pale-bellied Brent Geese were recorded within the Greencastle development area on four occasions: 05<sup>th</sup> December 2011 (count of 2 ~1% of NI SPA population); 16<sup>th</sup> January 2012 (count of 21 ~7%), 28<sup>th</sup> February (count of 13 ~4%) and 02<sup>nd</sup> March 2012 (count of 10 ~3%) totalling 46 birds (~14%). Birds were typically recorded upending along the tide line moving south towards Section 2.3. Sandwich Tern were recorded foraging on two occasions, 10<sup>th</sup> September 2012 (count of 2 ~<1% of NI SPA population) and 20<sup>th</sup> September 2012 (count of 1 ~<1%).

Black Guillemots associated with the Greencastle colony were most common with this count section (peak of 9) due to the mooring of tug boats with which they associate. Birds primarily used the area for displaying, with foraging relatively infrequent.

### Section 2.3 South East Greencastle Shoreline

Overall Count Section 2.3 was considered to be of the most importance to foraging birds in comparison to all other count sections at Greenore and Greencastle. A total of 25 bird species were recorded. Peak counts of Bar-tailed Godwit (33), Black-headed Gull (28), Common Gull (19), Curlew (48), Dunlin (45), Herring Gull (16), Lapwing (40), Oystercatcher (25), Redshank (25), and Ringed Plover (33) were recorded foraging over the extensive intertidal flats and amongst the oyster trestles.

Pale-bellied Brent Geese were recorded within the count section on five occasions: 14<sup>th</sup> November (count of 11 ~3% of NI SPA population) and. 16<sup>th</sup> January 2012 (count of 21 ~7%), 17<sup>th</sup> February 2012 (peak count of 47 ~14%), 28<sup>th</sup> February 2012 (count of 17 ~5%) and 12<sup>th</sup> March 2012 (count of 13 ~4%) totalling 109 birds (~34%).

#### Section 2.4 Green Island

Green Island was found to be the most significant roosting location for birds within the entire survey area, predominantly for overwintering and non-breeding Cormorant and Shag (combined peak of 284). A total of 16 bird species were recorded roosting on the island. Green Island was infrequently used by roosting waders namely Redshank (peak of 20), Lapwing (120), Oystercatcher (peak of 59) and Turnstone (35). Significant numbers of Great-black Backed Gull were also regularly recorded (130).

Brent Geese were recorded on five occasions primarily loafing in the vicinity of tideline of the Island during high tide conditions, before departing to Mill Bay or in the direction of Dundalk. A peak count of 23 birds (~7% of NI SPA population) were recorded on 01<sup>st</sup> January 2012. Nesting Terns on Green Island were not recorded during field surveys.

#### Section 2.5 Greencastle Point Islands

The nearshore islands at Greencastle Point occasionally supported small numbers of roosting birds during HT conditions. A peak count of 139 Lapwing, 44 Oystercatcher, and 25 Mallard were recorded in January 2012 and December 2011 respectively, with Oystercatcher being the most frequently recorded roosting species throughout the survey effort.

#### **Ferry Route**

A total of 18 bird species were recorded within the navigable waters between the Greenore and Greencastle terminals including:

- 6 species listed on Annex 1 of The Birds Directive;
- 2 Red-listed (Breeding) BOCCI;
- 13 Amber-listed BOCCI and;
- 3 Northern Ireland Priority Species.

#### Northern

A total of 15 bird species were recorded along the northern route, with Shag and Cormorant the most frequently recorded (peak of 24 and 25 respectively). Diving ducks were absent however small numbers of Great Northern and Red-throated Diver were recorded with peak counts of 5 and 2 respectively. Auk numbers (Razorbill and Common Guillemot) were also low.

Tern foraging activity was highest along the northern route in comparison with the southern but in general Terns showed a strong preference for foraging beyond the ferry route options, with a peak count of 40 Common Terns foraging over submerged limestone reef at Blockhouse Island on 03<sup>rd</sup> July 2012 and a peak count of 32 Sandwich Terns foraging at Soldiers Point on 14<sup>th</sup> August 2012. Peak counts of foraging Terns along the northern route comprised 1 Arctic Tern, 3 Common Tern and 16 Sandwich Tern. Birds largely foraged within the shallow waters beyond the sub-tidal zones at the start/end of the route and within the immediate waters of Green Island.

#### Southern

A total of 15 bird species were recorded along the southern route, with Shag and Black Guillemot the most frequently recorded (peak of 30 and 14 respectively). A peak count of 14 Great Northern Diver was also recorded on 14<sup>th</sup> November 2011 however, subsequent counts were typically of one or two birds.

Diving ducks and Grebes were generally absent with only a single count of four Red-breasted Merganser recorded on 27<sup>th</sup> April 2012.

Tern activity was only marginally less than along the northern route, with only sightings of Common and Sandwich Tern made. Similarly to the northern route, Terns typically foraged within the shallow waters at the beyond the sub-tidal zone at the start/end of the routes and within the immediate waters of Green Island. Peak counts of foraging Terns along southern route comprised 7 Common Tern and 4 Sandwich Tern.

### 6.3 Impact Assessment

An impact assessment has been undertaken in accordance with the Institute of Ecology and Environmental Management (IEEM) *Guidelines for Ecological Impact Assessment in the United Kingdom* (IEEM, 2006), and also using experience of 'best practice' in the ecological assessment of similar developments.

Where impacts are predicted the magnitude of the potential impact is assessed using the criteria set out in Tables 6.1-6.3. The impact significant (Table 6.3) is a combined function of the ecological value of the affected feature (Table 6.1) and the magnitude of the impact (Table 6.2). It is important to note that there is no universally recognised definition of what constitutes *significance*. A combination of data (where available), experience and the precautionary principle are therefore employed to select the appropriate ecological value, and magnitude categories. In cases where it is not possible to estimate magnitude, the precautionary principle is applied to assume the worst case scenario.

The ecological value is generally relatively easy to categorise. However, the magnitude of potential impact may be difficult (or in certain cases impossible) to categorize, and the following list of parameters are considered:

- Physical nature;
- Type (+ve/-ve);
- Range of features affected;
- Population sizes of features affected;
- Geographical scale;
- Duration;
- Cumulative effects.

Once identified and characterised for magnitude, each potential impact is assigned a likelihood of occurrence (after mitigation):

- Certain (100%);
- Near-certain (95-100%);
- Probable (50-95%);
- Unlikely (5-50%);
- Extremely Unlikely (0-5%).

Specific mitigation measures are proposed in Section 6.4 where required to offset impacts identified as likely and significant.

#### 6.3.1 Potential Impacts Overview

The nature of the proposed development has the potential to impact on ornithological interests both directly and indirectly and during construction and operation. The main potential impacts fall into the following categories:

##### Construction

- *Potential Pollution Impacts*  
Direct pollution impacts to wintering and breeding birds during construction  
Indirect pollution impacts to wintering and breeding birds as a result of food resource depletion during construction
- *Potential Disturbance Impacts*  
Direct noise, visual and lighting disturbance to wintering and breeding birds during construction  
Indirect disturbance from elevated noise and vibration to wintering and breeding birds as a result of food resource depletion and re-distribution during construction  
Direct collision impacts to wintering and breeding birds due to presence of construction plant
- *Potential Habitat Loss and Degradation Impacts*

Direct and permanent loss of wintering and breeding bird habitats  
 Change in wintering and breeding bird foraging habitat integrity due to sediment disturbance and settlement during construction

### Operation

- *Potential Pollution Impacts*  
 Direct pollution impacts to wintering and breeding birds during operation  
 Indirect pollution impacts to wintering and breeding birds as a result of food resource depletion during operation
- *Potential Disturbance Impacts*  
 Direct noise, visual and lighting disturbance to wintering and breeding birds during operation  
 Indirect disturbance from elevated noise and vibration to wintering and breeding birds as a result of food resource depletion and re-distribution during operation  
 Direct collision/disturbance impacts on wintering and breeding birds due to the presence of slipways and operation of the ferry
- *Potential Habitat Loss and Degradation Impacts*  
 Exacerbated erosion and inundation of Green Island resulting in the loss of wintering and breeding bird habitats caused by ferry wash and changes in coastal processes from the presence of slipways  
 Change in foraging site integrity of wintering and breeding birds due to changes in coastal processes and sediment disturbance and settlement

Potential pollution impacts during construction and operation (e.g. spills and releases of contaminants), although possible and difficult to predict, are considered highly unlikely provided effective pollution prevention guidelines are adhered to. A Construction Stage Environmental Management Plan (CEMP) will be prepared to assist the main contractor in preventing, managing and/or minimising any significant environmental impacts during the construction phase. In order to achieve this the CEMP will comprehensively incorporate all environmental commitments in this ES/EIS and provide a method of compliance with these. The CEMP shall be submitted to the Planning Authorities and relevant Statutory Nature Conservation Bodies (e.g. NIEA and NPWS) for comment and approval prior to the commencement of any works.

Lighting disturbance to overwintering and breeding birds are predicted to be Non-Significant and are not further discussed here. This is due to the minimal amount of lighting proposed at the site during construction and operation (Chapter 3). Downwards directional lighting is proposed to be used at each terminal, which will prevent light spill outside of the development footprint, otherwise illuminating areas which were previously dark at night. During operation it is proposed that lighting at each terminal will be switched off at night, leaving only a single intermittent navigational light at the end of each slipway, similar to those already in use on navigational buoys within the Loughs navigable channel.

#### 6.3.1.1 Construction Impacts

##### 6.3.1.1.1 Disturbance

###### *Greencastle*

The extent to which birds are affected by sources of noise and visual disturbance has been the subject of extensive research and monitoring due to potential long term effects of disrupted foraging and roosting behaviour, which can lead to decreases in body condition and a reduction in reproductive success and individual survival. In general, studies show that most bird species have the ability to habituate quickly to regular noises and visual disturbances (Smit & Visser, 1993, Hockin *et al.*, 1992; ABP Research, 2001; Nairn, 2005; Phalan & Nairn, 2007).

Piling is likely to create the most significant noise during construction of the Greenore and Greencastle terminals, resulting in a series of regular "bangs" whilst steel tubular piles to support the suspended berthing facilities are driven into the seabed. Chapter 11 (Noise and Vibration) predicts that elevated noise at Greencastle as a result of piling will be in the effect of 87 dB[A] at 10m, 75 dB[a] at 40m, 69 dB[A] at 80m, 63 dB[A] at 160m and 57 dB[A] at 320m from the proposed development footprint. In addition the overall combined worst-case noise level scenario (based on a combination of construction activities) is predicted to be in effect of 93 dB[A] at 10m, 81 dB[a] at 40m, 75 dB[A] at 80m, 69 dB[A] at 160m and 63 dB[A] at 320m from the proposed development footprint. The installation of acoustic

screening (as outlined in Chapter 11) would further attenuate elevated noise levels from construction activities and provide visual screening of construction activities.

Several studies have specifically addressed the effects of piling disturbance on wetland birds. A 1999 study by the Institute of Estuarine Coastal Studies (IECS) found that irregular piling noise (above 70dB) and regular piling noise (below 70dB) typically resulted in a *High to Moderate* and *Moderate* degree of disturbance to wetland birds respectively, whereas construction personnel or third party personnel on intertidal flats typically resulted in a *High* degree of disturbance (ABP Research, 2001). The study found that although piling had an initial impact, rapid habituation was recorded and that third party disturbances (people on intertidal flats) consistently resulted in greater impacts than those of ongoing construction works. Similar studies have also indicated that in general birds habituate to continual noise and visual disturbances as long as there is no large amplitude 'startling' component (Hockin *et al.*, 1992; Phalan & Nairn, 2007). Construction worker activities are predicted to be highly restricted to the immediate Greencastle development footprint. Noise and visual disturbance to birds using the Greencastle shoreline and Greencastle Pier Road is therefore not predicted to extend significantly beyond the development area. A recent study of roosting waders in Galway Bay within 200m of a major construction site found the majority of species remained undisturbed (Nairn, 2005).

Overall disturbance during the construction of the Greencastle terminal is not predicted to have any significant impact on birds feeding and/or roosting within surrounding intertidal areas. Only low numbers of birds were recorded within the development area (Count Section 2.2) during RPS Wetland Bird Surveys and no regular roost sites were located in the vicinity of the proposed footprint (Count Section 2.1 and 2.3). Any impact will also be temporary given the short project construction timeframe, with all works scheduled for completion within approximately 6 months of commencement (Chapter 3).

Similarly no impact on birds within preferred bird foraging and roosting habitats in Mill Bay is predicted (Section 6.2.6.1). Chapter 11 predicts that elevated noise levels during the construction phase (modelled in the worst case scenario) at Greencastle will continue to attenuate with increasing distance from the development area. Modelled elevated noise levels at sensitive receptors approx 300m from the development footprint were predicted to be within permissible construction noise levels (61-63 dBA). Elevated noise levels within Mill Bay located >500m from the Greencastle development site would therefore be predicted to be further attenuated, particularly given the shielding nature of the lands between Greencastle and Mill Bay. Similarly no impact on roosting and or nesting birds on Green Island and the nearshore islands of Greencastle point are predicted due to disturbance noise attenuation.

Construction activities (particularly piling) at Greencastle has the potential to impact on bird finfish and shellfish prey species as a result of elevated noise and vibrations in the water column. This may result in physiological stress to individual fish and the avoidance of the development area. The spawning of some fish, particularly those which are likely to spawn in the sandy sediments within the development area such as sandeel, may also be disrupted (Chapter 7). Chapter 7 predicts that the actual impacts on finfish, particularly migrating salmonid and sandeels, will be moderate and temporary and restricted to the immediate development area. The impact on shellfish will be of 'Negligible Significance'. Impacts on bird finfish and shellfish prey resources are therefore predicted to be Non-Significant. Mitigation is proposed to minimise the impacts of piling on salmonid migration by concentrating piling activities during the period November-March, which overlaps with the critical wintering bird season. This is unlikely to elevate any noise or visual disturbance to birds given the low numbers of birds recorded along the Greencastle shoreline (Section 6.2.7).

#### *Greenore*

Piling is also likely to create the most noise disturbance during construction of the Greenore terminal. Chapter 11 predicts that elevated noise at Greenore as a result of piling will be in the effect of 91 dB[A] at 10m, 79 dB[a] at 40m, 73 dB[A] at 80m, 67 dB[A] at 160m and 61 dB[A] at 320m from the proposed development site. In addition the overall combined worst-case noise level scenario (based on a combination of construction activities) is predicted to be in effect of 94 dB[A] at 10m, 82 dB[a] at 40m, 76 dB[A] at 80m, 70 dB[A] at 160m and 64 dB[A] at 320m from the proposed development site. The installation of acoustic screening (as outlined in Chapter 11) would further attenuate elevated noise levels and provide visual screening of construction activities.

Noise and visual disturbance to birds within the vicinity of the Greenore development area, are predicted to be Non-Significant primarily due to the low numbers of birds that use the Greenore shoreline within the vicinity of the proposed footprint (Section 6.2.7; Appendix 6.5). Only small numbers of birds were recorded within the Greenore development area however, the Greenore Breakwater was found to be of particular significant to roosting Cormorant and Shag. The Greenore development area is already subject to a high level of disturbance from Greenore Port and the shoreline to the southeast of the development area is already accessible to the public. Such existing disturbance and the lack of intertidal exposure is therefore likely to be preventing any significant use of the development by birds in general, but is not currently preventing notable numbers of Cormorant and Shag roosting on the Greenore Breakwater. Construction worker activities are expected to be highly restricted to the immediate Greenore development footprint. Noise and visual disturbance to birds using the Greencastle shoreline and Greencastle Pier Road is therefore not predicted to extend significantly beyond the development area. Nesting Black Guillemots on the Greenore Port quay wall are already highly tolerant of Greenore Port activities.

No impact on preferred intertidal feeding and high-tide roosting habitats towards Ballynatrasna and adjacent to the Greenore Golf Club and Carlingford (Section 6.2.6.6) is predicted as a result of noise and or visual disturbance. Chapter 11 predicts that elevated noise levels during the construction phase (modelled in the worst case scenario) at Greenore will attenuate significantly with increasing distance from the development. Birds within these preferred foraging areas are also highly tolerant of aquaculture activities, which occur throughout low-tide during the wintering season.

Potential impacts on bird prey resources as detailed for Greencastle as a result of construction activities at Greenore are also predicted to be Non-Significant.

#### 6.3.1.1.2 Direct Habitat Loss

##### *Greencastle and Greencastle Pier Road*

The construction of the Greencastle terminal will result in the direct and permanent loss of approx 0.32ha of improved grassland. As the berth will be suspended on steel tubular piles forming an open structure only the combined footprint of the steel tubular piles will constitute direct habitat loss from the upper shoreline comprising approx 7m<sup>2</sup> of shingle and approx 17m<sup>2</sup> of sandy intertidal flats LS.LSa.MoSA.AmSco and LS.LSa.FiSA.Po (Chapter 7). An additional 510m of defunct hedgerow and 40m of stone wall boundary will also be removed along the Greencastle Pier Road. The habitats to be lost are considered to be of low importance to birds. No regular high-tide roosts of wetland birds were located within the Greencastle development area and only low numbers of birds were recorded foraging within the intertidal and sub-tidal zones (Section 6.2.7).

The intertidal shoreline within the development area is comprised of medium and fine sands which are highly mobile and devoid of organic matter (Chapter 7). The mobile nature of the sediments has led to a species poor infauna community dominated by polychaetes *Nephtys cirrosa* and *Scolelipsis squamata*, as well as the bivalve mollusc *Angulus tenuis*. The development area is therefore considered to be of low importance to a large number and range of foraging shorebirds regardless of existing disturbances. Eel grass (*Zostera* spp.) was not recorded within the Greencastle development footprint, and only locally common amounts of *Enteromorpha* were noted on the existing wooden Greencastle Pier and rocky outcrops to the east and west of the development area. Whilst the amount of intertidal foraging habitat available to foraging birds will be very slightly reduced as a result of the proposed development, it is non predicted that the loss of this particular area will significantly affect the integrity of foraging potential along the northern Carlingford Lough shoreline.

The construction of the Greencastle terminal is expected to result in the loss of a small number of terrestrial breeding bird territories (namely Wren, Robin, Pied Wagtail, Blackbird, Chaffinch and Dunnock), due to the clearance of hedgerow and stone-wall habitats long the Greencastle Pier Road. This impact is predicted to be temporary and Non-Significant provided mitigation and compensation outlined in Section 6.4 is adopted. Ringed Plover were not recorded nesting along the Greencastle shoreline and no impact as a result of direct nesting habitat loss is predicted. A Black Guillemot colony (approx 3 pairs) appears established at Greencastle however, the development is predicted to only result in a localised movement of moored boats birds associate with, to facilitate the operation of the ferry.

### *Greenore*

The construction of the Greenore terminal will result in the direct and permanent loss of approx 0.28ha of buildings and recolonised hardstanding, 0.05ha of rock armour, 0.04ha of unvegetated shingle and gravel. The Greenore terminal will largely be built on the existing hardstanding within Greenore Port. The habitats to be lost are considered to be of low importance to birds. No regular high-tide roosts of wetland birds were located within the development area and foraging birds were largely restricted to the sub-tidal zone. Only small numbers of birds were recorded within the Greenore development area (Section 6.2.7). Activity is likely hindered by the lack of exposed intertidal foraging areas, disturbance from existing activities at Greenore Port and human disturbance along the shoreline. Pale-bellied Brent Geese were not recorded within the development area.

The intertidal shoreline within the development area is comprised of LS.LCS.SH - coarse gravels, medium/coarse sand and shingle and is highly mobile. This is preventing the development of any algae or infauna with only a single *Orbina* spp. recorded within the development area (Chapter 7). The development area is therefore considered to be of little importance to foraging shorebirds regardless of existing disturbances. Eel grass (*Zostera* spp.) was not recorded during Marine Ecology surveys undertaken along the Greenore shorelines however, *Enteromorpha* was found extensively across the rock armour (Chapter 7). Whilst the amount of potential intertidal foraging habitat available to foraging birds will be very slightly reduced as a result of the proposed development it is not predicted that the loss of this particular area will adversely affect the integrity of foraging potential along the southern Carlingford Lough shoreline.

The construction of the Greenore terminal is expected to result in the loss of a small number of terrestrial breeding bird territories (namely House Sparrow, Pied Wagtail, Robin, Swallow and Wren) due to the clearance of recolonising hardstanding and the disturbance of the old concrete store within Greenore Port. This impact is predicted to be temporary and Non-Significant provided mitigation and compensation outlined in Section 6.4 and 6.5 is adopted. Ringed Plover were not recorded nesting along the Greenore shoreline and no impact as a result of direct nesting habitat loss is predicted. A Black Guillemot colony (approx 10 pairs) is well established at Greenore Port however, the construction of the Greenore terminal is not predicted to result in the direct loss of currently used nesting crevices. No impact as a result of direct nesting habitat loss is therefore predicted.

#### 6.3.1.1.3 *Sediment Suspension*

The construction of the Greencastle and Greenore terminals has the potential to result in a temporary increase in suspended sediment levels as a result of piling, infilling and physical disturbance to small working areas within the intertidal and shoreline development areas. This has the potential to directly impact on bird foraging activities within the vicinity of the development footprint as a result of decreased water clarity. Vision is an important component in the foraging activity of seabirds including Terns, Auks and Gannets and water clarity may therefore play an important role in the foraging success of these and other species (Essink, 1999; Garthe *et al.*, 2000; Gastone, 2004; Thaxter *et al.*, 2010).

The disturbance of sediments during construction also has the potential to indirectly impact on bird foraging activity through impacts on food resources including finfish and shellfish prey species (Chapter 7). Elevated suspended solid concentrations in the water column will primarily interfere with fish gill function, potentially leading to fatalities or avoidance of turbid waters. They can also interfere with the natural migrations of fish (e.g. salmonids) resulting in the change in abundance and distributions of prey items for piscivorous birds including Terns, Divers, Grebes, Cormorants and Shags. The subsequent settlement of solids may result in the smothering of spawning sites and epifaunal species (e.g. lobster and crab) and the inhibition of shellfish respiration and filter-feeding. With regard to smothering of benthic habitats, any impact which slows or prevents larval development will ultimately affect adult recruitment and the availability of prey species for piscivorous and shellfish foraging birds (Chapter 7). Eel grass (*Zostera* spp.) beds and intertidal infauna are also highly sensitive to smothering by the redistribution of suspended sediments however, eel grass (*Zostera* spp.) was not recorded within the development area.

The impact on foraging birds, particularly piscivorous plunge and pursuit divers and is predicted to be Non-Significant. Chapter 9 outlines that tidal flows within the Greencastle development areas are strongly bi-directional and Chapter 7 illustrates that the intertidal and sub-tidal communities are

already pre-adapted to wave and current-induced disturbances. This would suggest that any sediment release (particularly of fine sandy sediments such as those at Greencastle) will be rapidly dispersed by existing tidal currents and would re-settle within the near-field environment. Chapter 7 subsequently predicts that the impacts on local aquaculture and fisheries as a result of changes in sediment loading within the water column during construction will be of 'Negligable Significance'. Changes in the availability (abundance and distributions) of finfish and shellfish bird prey items are therefore also predicted to be Non-Significant.

The temporary disturbance of intertidal and upper shoreline habitats due to the movement of construction plant will result in disruption of sediment infauna communities. Disruption at Greencastle is likely to extend into the adjacent shorelines beyond the development footprint. Chapter 7 concludes that this will have a negligible long term impact on sediment communities and therefore potential shorebird prey items. Disturbed areas will begin to recover immediately once shoreline construction works cease and larval settlement occurs.

#### 6.3.1.1.4 *Collision Impacts*

Collision risks with construction machinery and built structures is highest amongst "heavy wing loading" species such as geese and swans. It is also increased where birds undertake daily migrations during the hours of dusk and dawn to foraging and roosting locations. The potential collision impacts on birds with plant machinery during construction of the Greenore and Greencastle terminals are however, considered unlikely due to the temporary presence of construction machinery. The presence of the two built terminals and the operation of the ferry are also unlikely to create significance collision risks. Current obtrusive structures including the Greenore Breakwater, Greencastle Pier and moored boats along the Greencastle shoreline do not appear to pose any collision risk to 'heavy wing loading' species.

#### 6.3.1.1.5 *In-Combination Effects*

Potential construction impacts above have been addressed both independently and with regards to any other project or plan listed in Chapter 3, which together may act in-combination to adversely impact on ornithological features. Due to the small scale of the proposed Carlingford Ferry development, the temporary nature of construction and the distance from other developments outlined in Chapter 3 no in-combination effects on ornithological features are predicted.

#### 6.3.1.2 *Operational Impacts*

##### 6.3.1.2.1 *Disturbance*

The operation of the ferry will introduce a more permanent but regular, short noise and visual disturbance source to the Greenore and Greencastle shorelines. As outlined in Section 6.3.1.1.1 birds are known to habituate quickly to regular noise and visual disturbances considered to be non-threatening. In the absence of ferry wash the passing of the vehicular ferry is not predicted to cause a significant visual disturbance to nesting and roosting birds on Green Island and the Greenore Breakwater. Observations of passing cargo vessels which pass frequently within approx 200m of Green Island showed no disturbance to incubating or roosting birds (N. Robinson, *Pers Obs*). Disturbance to incubating and roosting birds was generally associated with more discrete sources such as predatory gulls landing nearby, the presence of raptors (e.g. Merlin and Peregrine), the approach of small recreational motor boats and storm waves. Following disturbance birds typically re-settled on Green Island and the Greenore Breakwater within a few minutes.

The increase in boat traffic between Greenore and Greencastle has the potential to increase disturbance to diving birds including Cormorant Shag, Great Crested Grebe, Scaup, Great Northern Diver and Red-breasted Merganser. Whilst some bird groups such as gulls have been shown to be attracted to areas within increased shipping activity, many others including seaducks, divers, shearwaters and grebes have been shown to activity avoid shipping lanes and may be at risk of collisions (Kaiser, 2004; Borberg *et al.*, 2005 ; Larsen & Laubek, 2005). Such impacts are however predicted to be Non-Significant. This is due to the low numbers of birds (including seaducks) recorded within the navigable waters and the nature of the proposed vehicle ferry and its operation speed of 8-



12knots (Section 6.2.7; Appendix 6.5). Smaller and faster moving crafts such as recreational motor boats typically cause a greater disturbance and collision risk to diving birds (Larsen & Laubek, 2005).

The operation of the ferry also has the potential to impact on bird finfish and shellfish prey species as a result of elevated noise and vibrations in the water column. Whilst larger fast moving vessels have the ability to result in higher levels of noise and vibration, a car ferry similar to the one that is being proposed, has operated across the entrance to Lough Foyle for the last 10-15 years without any potential impacts on fisheries particularly the migration of salmonids (Chapter 7). Chapter 7 predicts that the impacts on finfish and shellfish will be of 'Negligible Significance'.

#### 6.3.1.2.2 *Sediment Suspension*

The operation of the ferry has the potential to result in temporary increases in suspended sediment levels as outlined in Section 6.3.1.1.3 along its course in the long term due to propeller wash. Resultant impacts on bird food resources and foraging activity remain Non-Significant due to the strong bi-directional nature of the Lough's currents and the predicted settling of sediments within the near-field environment.

#### 6.3.1.2.3 *Indirect Habitat Loss*

##### *Greenore*

The presence of the Greenore slipway could potentially cause some change to the natural coastal processes and sediment transport regime at Greenore, potentially impacting on bird food resources. Chapter 7 and Chapter 9 predict that that changes in littoral currents and sediment transport regime due to the presence of the slipway at Greenore will be restricted to within 400m to the southeast of the development area. This would not have any impact on preferred bird intertidal foraging habitats only the Greenore to Ballagan shoreline (Section 6.2.6.6). Chapter 7 also outlines that the sedimentation of finer sediments at Greenore due to a slight decrease in current speed may actually seek to increase the density of the substrates infauna.

##### *Greencastle*

Chapter 9 predicts that changes in littoral currents, as a result of the construction of the proposed slipway at Greencastle, will be restricted to within 100m of the project footprint and are unlikely to impact on the existing sediment transport regime. This is due to the open nature of the slipway. Chapter 7 outlines that the presence of the Greencastle slipway will have little impact on the sedimentary environment on the bird and therefore on bird food resources. Predicted increases and or decreases in current flow due will not impact on the sediment transport regimes within Mill Bay resulting in the degradation of significant intertidal foraging areas including sensitive saltmarsh and *Zostera* beds which predominantly occur within Mill Bay. The indirect impact on birds as a result of potential foraging habitat degradation is predicted to be Non-Significant.

Chapter 9 predicts that the construction of the Greencastle (and Greenore) berthing facilities will not result in any additional erosion or inundation pressures on Green Island, with any predicted changes in tidal current speed and wave height restricted to the immediate vicinity of the slipway (within 100m). It is important to note that in Chapter 9 wave height was modelled under wave generated due to Force 8 gales from the south-east combined with spring high tides, which are likely to cause the most significant inundation of the low lying parts of Green Island where terns currently choose to nest. Chapter 9 also predicts that across the range of operating conditions (vessel speed and tidal range), the waves generated due to wash will be similar to those already experienced within the lough due to frequent meteorological events. Wave height as a result of the ferry wash will attenuate with distance from the ferry and therefore waves at Green Island, which is a minimum of 200m from the preferred route option and will be within the norm experienced on the shoreline of the island (Chapter 9). Erosion pressures on Green Island are therefore not predicted to be exacerbated above their current natural levels leading to accelerated losses of bird nesting and roosting habitats.

#### 6.3.1.2.4 *Collision Impacts*

Collision risks with the built Greenore and Greencastle slipways are considered unlikely due to their grading nature. The key routes taken by Brent Geese commuting from their roost in Dundalk Bay into Mill Bay and towards Carlingford typically extend >50-100m from the shoreline, beyond Green Island

and the Greenore Breakwater (N. Robinson, *Pers Obsvs*). On occasion where geese commute within 100m of the shoreline flight heights are typically well above that of the existing Greencastle and Greenore Breakwater, which are not considered significant collision risks even in the hours of dusk and dawn.

#### 6.3.1.2.5 Cumulative Impacts

Potential operational impacts above have been addressed both independently and with regards to any other project or plan listed in Chapter 3, which together may act in-combination to adversely impact on ornithological features. Due to the small scale of the proposed Carlingford Ferry development, the temporary nature of construction and the distance from other developments outlined in Chapter 3 no in-combination effects on ornithological features are predicted.

### 6.3.2 Potential Impacts on Designated Sites

The nearest designated sites with ornithological features of interest include the NI and ROI Carlingford Lough SPAs, Carlingford Lough ASSI, Carlingford Lough Ramsar Site and the NI and ROI Carlingford Lough IBAs. Table 6.6 provides a summary of designated sites and their qualifying features considered as part of this Chapter.

#### 6.3.2.1 NI Carlingford Lough SPA

The proposed Greencastle terminal is partially located within the NI Carlingford Lough SPA (Site Code: UK9020161). Carlingford Lough SPA qualifies for designation by supporting populations of European importance of the following species:

- Sandwich tern (717 breeding pairs);
- Common tern (443 breeding pairs);
- Pale-bellied Brent Goose (258 overwintering individuals).

The site has also previously supported nesting Roseate Tern and Arctic Tern. For the purposes of this impact assessment all Tern species are considered under this SPA designation.

In addition to the above selection features the Conservation Objectives for Carlingford Lough SPA outlines further features of 'Habitat extent' and 'Roost site locations' (Appendix 5.3). Whilst not selection features under which the SPA is designated, they are more easily treated as if they were. 'Habitat extent' includes all the main inter-tidal habitats and nesting sites (current, past and potential) used by the selection features. At present the SPA boundary and therefore the Conservation Objectives does not include marine areas used by foraging Terns.

Potential impacts on the Carlingford Lough SPA are summarised in Table 6.24. All potential impacts detailed in Table 6.24 are predicted to be Non-Significant provided the adoption of mitigation outlined in Section 6.4

The proposed development will not result in the direct loss of Pale-bellied Brent Goose roosting habitat or nesting Tern habitat. Only the combined footprint of the steel tubular piles will constitute the direct loss of intertidal area potentially usable by Pale-bellied Brent Geese from within the SPA. Approx 20 steel tubular piles of approx 1219mm in diameter are proposed to be located within the SPA. This constitutes an approx area of approx 24m<sup>2</sup>. The shoreline area to be lost comprises shingle (Chapter 5) and sandy intertidal flats (Chapter 7), which were found to be of low importance to foraging overwintering Brent Geese (peak count of 21 within the development area) in comparison with Mill Bay.

Overwintering Pale-bellied Brent Geese in Ireland have historically relied on eel grass (*Zostera* spp.) as a major component of their diet. In the 1930's there was a distinct decline in common eel grass (*Z. marina*) along the North Atlantic coasts due to "wasting disease". Although some sea grass sites recovered by the 1950's, more recent anthropogenic pressures have caused more widespread sustained declines (Dale *et al.*, 2007). Pale-bellied Brent geese therefore have a much more diverse diet including green algae (e.g. *Enteromorpha*), saltmarsh plants (including *Festuca* spp. and *Puccinella* spp.), cereal stubbles, waste agricultural crops and grasses. Eel grass is however, likely to

remain an important food plant for Pale-bellied Brent Geese (and Wigeon) in Carlingford Lough, particularly during the early wintering stage (Robinson *et al.*, 2004). Eel grass (*Zostera* spp.) was not recorded during Marine Ecology surveys undertaken along the Greencastle shoreline and green algae (*Enteromorpha*) was found to be locally restricted to the Greencastle Pier and rocky outcrops to the north-west and south-east of the Greencastle development footprint (Chapter 7). Whilst the small loss of intertidal habitats at Greencastle will reduce the potentially usable intertidal habitat for Pale-bellied Brent Geese within the SPA, the loss of these particular habitats is predicted to be non-significant and is not predicted to affect the integrity of foraging habitat extent within the SPA.

The degradation of foraging habitats for both Pale-bellied Brent Goose and nesting Terns due to suspended solids during construction and operation is predicted to be Non-Significant due to the restricted nature of sediment re-suspension and settlement within the near-field environment. No impacts within Mill Bay known to support critical numbers of the overwintering Pale-bellied Brent Geese SPA Population are predicted (Section 6.2.6.1). All three Tern species were recorded foraging within the vicinity of the Greencastle (and Greenore) development area however, foraging activity is considered to be widespread throughout the Lough (particularly at the mouth of the Lough). Chapter 9 concludes that potential impacts on likely Tern prey items, namely sandeels and fry, as a result of elevated noise, vibration and suspended sediments are predicted to be of 'Negligible Significance' and will be restricted to the immediate ferry route and development areas.

Noise and visual disturbance to Pale-bellied Brent Geese and nesting Terns is predicted to be Non-Significant during both the construction of the Greencastle (and Greenore) terminal and during the operation of the ferry. This is primarily due to the low numbers of Pale-bellied Brent Geese that use the Greencastle development area and the ability of birds to habituate to regular disturbances. Terns are typically highly tolerant of noise and visual disturbances often nesting within busy commercial shipping ports (e.g. Port of Cork, Ringaskiddy). No noise or visual impacts are predicted on birds within Mill Bay.

The productivity of the SPA Tern colony on Green Island is currently considered to be threatened by two key factors including the predation/disturbance by large gulls (namely Great Black-backed Gull) and the submersion of nests and eggs by frequent storm events. All three species of Tern currently favour the most southerly and lowest lying part of Green Island on which to nest. Chapter 9 predicts that the operation of the ferry across a range of operating conditions is not predicted to result in the increased submersion of nest sites and exacerbated erosion as a result of ferry wash. Wave height is predicted to attenuate with distance from the ferry and therefore waves at Green Island will be within the norm experienced on the shoreline of the island (Chapter 9). The operation of the ferry is therefore not predicted to have a significantly adverse impact on the integrity of the Carlingford Lough SPA nesting Tern population. The SPA Conservation Objectives seek to maintain the extent of habitat components subject to natural processes. Natural processes are therefore likely to continue to impact on the productivity of the SPA Tern colony without any predicted exacerbation by ferry wash.

The collision of Pale-bellied Brent Geese with the temporary presence of construction plant and the newly constructed pier and slipway is predicted to be Non-Significant. Current obtrusive structures including moored boats and the existing Greencastle Pier do not appear to pose any collision risk to the species. Similarly the collision of Pale-bellied Brent Geese with existing Carlingford Lough vessel traffic is unreported. Similar collision risks to Terns are predicted to be highly unlikely and are not considered due to their small size and agile flight.

### 6.3.2.2 ROI Carlingford Lough SPA

The proposed Greenore terminal is located approx 300m to the north east and approx 600m to the north west of the ROI designated Carlingford Lough SPA (Site Code: IE0004078). Potential impacts on the Carlingford Lough SPA are summarised in Table 6.25.

Carlingford Lough SPA qualifies for designation by supporting populations of European importance of the following species:

- Pale-bellied Brent Goose (253 overwintering individuals).

Potential impacts on Carlingford Lough SPA are summarised in Table 6.25. All potential impacts detailed in Table 6.25 are predicted to be Non-Significant provided the adoption of mitigation in Section 6.4.

The proposed development will not result in the direct loss of Pale-bellied Brent Goose Roosting Habitats outside of the SPA. The area to be lost comprises existing hardstanding and buildings from within Greenore Port, rock armour and sandy intertidal flats and were found to be of low importance to Pale-Bellied Brent Geese (Section 6.2.7). Eel grass (*Zostera* spp.) was not recorded during Marine Ecology surveys undertaken along the Greenore shorelines however, *Enteromorpha* was found extensively across the rock armour (Chapter 7). The rock armour is not considered to be an important foraging habitat for Brent Geese and the loss of this habitat is predicted to be Non-Significant, and will not adversely affect the integrity of foraging potential for Pale-bellied Brent Geese along the southern Carlingford Lough shoreline.

Similarly the indirect loss of foraging habitats for both Pale-bellied Brent Goose due to degradation is predicted to be Non-Significant due to the restricted and temporary nature of sedimentation associated with construction works, the presence of the slipway and operation of the ferry. The assessment of the project impact on littoral currents in Chapter 9 predicts that the sediment transport regime would not be effected beyond 400m southeast along the Greenore to Ballagan shoreline, therefore avoiding important Pale-bellied Brent Goose foraging habitats at Ballynatrasna (Section 6.2.6.6). No significant impacts on sediment transport to the west of the development are predicted.

Disturbance to Pale-bellied Brent Geese at Greenore is considered to be non-significant during both the operation and construction of the ferry. This is primarily due to the negligible numbers of Pale-bellied Brent Geese known to use the Greencastle development area. Similarly noise and visual disturbance to birds foraging within important habitats to the southeast and southwest of the development are not predicted. This is due to predicted noise attenuation and the ability of birds to habituate to regular non-threatening disturbances. The regular passing of cargo vessels through the Lough within sight of preferred foraging areas at Ballynatrasna and adjacent to the Greenore Golf Course does not appear to hinder the presence or foraging activity of Pale-bellied Brent Geese. Similarly aquaculture activities within both sites during the winter does not deter foraging birds.

The collision of Pale-bellied Brent Geese with temporary construction plant and the newly constructed slipway is predicted to be Non-Significant. Current obtrusive structures including the Greenore Breakwater and Cranes within Greenore Port do not appear to pose any collision risk to the species. Similarly the collision of Pale-bellied Brent Geese with existing Carlingford Lough vessel traffic is unreported.

All potential impacts above are not predicted to act in-combination with any likely impacts resulting from additional developments outlined in Chapter 3 to the detriment of the conservation objectives of Carlingford Lough SPA.

### 6.3.2.3 Carlingford Lough Ramsar Site

The proposed Greencastle terminal is partially located within the Carlingford Lough Ramsar Site, which qualifies for designation:

- By supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species. The site supports nationally important breeding populations of Common Tern and in the recent past the site also supported nationally important numbers of Arctic Tern. Roseate Terns have also previously bred, with 2 breeding pairs recorded in 1997.
- By supporting species/populations occurring at levels of international importance including Sandwich Tern during the breeding season (650 apparently occupied nests) and Pale-bellied Brent Goose (300 individuals).

Sections 6.3.2.1 and 6.3.2.2 already detail potential impacts on nesting Terns and overwintering Pale-bellied Brent Geese and are considered in-combination with any likely impacts resulting from additional developments outlined in Chapter 3. No additional impacts on the Carlingford Lough Ramsar site are predicted.

#### 6.3.2.4 Carlingford Lough ASSI

The proposed Greencastle terminal is partially located within the Carlingford Lough ASSI. Potential impacts on the Carlingford Lough ASSI are summarised in Table 6.26.

Management objectives for qualifying features of interest are presented in Appendix 5.3 Designated Site Information. The qualifying features of interest for Carlingford Lough are summarised as follows:

- Coastal Saltmarsh;
- Mudflats,
- *Zostera* (Seagrass) Beds;
- The Geological Series;
- Wintering Waterbirds;
- Breeding Terns.

This section details potential impacts on wintering waterbirds not already covered in Sections 6.3.2.1 and 6.3.2.2 above and includes Great Crested Grebe, Shelduck, Scaup, Red-breasted Merganser, Oystercatcher, Dunlin and Redshank.

All impacts detailed in Table 6.26 are predicted to be Non-Significant provided the adoption of mitigation in Section 6.4.

The direct and permanent loss of habitats from within the ASSI potentially available for foraging and roosting birds will be small (24m<sup>2</sup>), equating to the combined footprint of the steel tubular piles used to support the Greencastle pier and slipway. The intertidal habitats to be lost within the development area are considered to be of low importance to Oystercatcher (peak count of 47), Dunlin (2) and Redshank (25). The proximity to residential dwellings and pedestrian disturbance along the narrow beach is likely deterring high numbers of birds from regularly using the area. Shelduck was not recorded within the Greencastle development area and the shoreline is considered to be of negligible importance for this species in general.

The intertidal habitats to be lost at Greencastle are categorised by LS.LSa.MoSA.AMSco in the upper shore and LS.LSa.FiSa.Po in the mid and low-shore areas (Chapter 7). Both habitats are considered to be highly mobile containing little organic matter leading to species-poor infauna communities. Therefore the development area is not considered to be of high importance to birds, regardless of existing disturbances.

Direct noise and visual disturbance to birds on the Greencastle shoreline during construction and operation of the ferry are as discussed in Sections 6.3.1.1.1 and 6.3.1.2.1 are predicted to be Non-Significant. This is primarily due to the low numbers of birds that use the Greencastle shoreline and nearshore waters and the temporary nature of construction works.

The increase in boat traffic between Greenore and Greencastle has the potential to increase disturbance to diving species including Great Crested Grebe, Scaup and Red-breasted Merganser. Such impacts are however considered unlikely and Non-Significant due to the low numbers of such species recorded within the navigable waters and the nature of the vehicle ferry proposed (Section 6.2.7; Appendix 6.5).

As detailed above the construction of the Greenore and Greencastle terminals and the operation of the vehicle ferry may result in a temporary increase in suspended sediment levels as a result of piling, infilling and physical disturbance. This has the potential to directly impact on Great Crested Grebe, Scaup and Red-breasted Merganser foraging activities within the vicinity of the development footprint as a result of decreased water clarity. Resultant sediment plumes will however, be temporary with sediments predicted to settle rapidly within the near field.

The disturbance of sediments, noise and vibration during construction and operation also has the potential to indirectly impact on Great Crested Grebe, Scaup and Red-breasted Merganser foraging activity through impacts on prey species including finfish and shellfish (Chapter 7). Chapter 7 predicts that the effects on local aquaculture and fisheries as a result of changes in sediment transport, elevated noise and vibration during construction and operation are predicted to be of 'Negligible

Significance'. Changes in the availability (abundance and distribution) of bird finfish and shellfish prey items are therefore considered to be non-significant.

The collision of wintering waterbirds with construction plant and the newly constructed slipway are predicted to be Non-Significant due to the generally small size and agile flight of birds which typically use and fly along the Greencastle shoreline.

All potential impacts above are not predicted to act in-combination with any likely impacts resulting from additional developments outlined in Chapter 3 to the detriment of the conservation objectives of Carlingford Lough SPA.

#### 6.3.2.5 NI Carlingford Lough IBA

The proposed Greencastle terminal is partially located within the NI Carlingford Lough IBA. Potential impacts on the Carlingford Lough IBA are summarised in Table 6.27.

The NI Carlingford Lough IBA Trigger Species comprise:

- Common Tern (509 pairs);
- Sandwich Tern (826 pairs);
- Pale-bellied Brent Geese (495 individuals);
- Great Crested Grebe (190 individuals);
- Scaup (255 individuals);
- Red-breasted Merganser (118 individuals);
- Redshank (1,278 individuals) and;
- Cormorant (210 individuals).

This section details potential impacts on birds not already covered above and includes only Cormorant.

The construction of the Greenore and Greencastle terminals will not directly result in the loss of Cormorant (and Shag) roosting habitat on Green Island and the Greenore Breakwater. Direct noise and visual disturbance to birds roosting on the Green Island and the Greenore Breakwater during construction and operation of the ferry are as discussed in Sections 6.3.1.1.1 and 6.3.1.2.1 and are predicted to be Non-Significant. Primarily due to the existing disturbance at Greenore Port and the tolerance of roosting Cormorant (and shag) on Green Island of the passing of larger cargo vessels.

The increase in boat traffic between Greenore and Greencastle has the potential to increase disturbance to diving species including Cormorant (and Shag). Such impacts are however predicted to be Non-Significant due to the low numbers of such species recorded within the navigable waters and the nature of the vehicle ferry proposed (Section 6.2.7; Appendix 6.5).

As detailed above the construction of the Greenore and Greencastle terminals and the operation of the vehicle ferry may result in a temporary increase in suspended sediment levels as a result of piling, infilling and physical disturbance. This has the potential to directly impact on Cormorant (and shag) foraging activities within the vicinity of the development footprint as a result of decreased water clarity. Resultant sediment plumes will however, be temporary with sediments predicted to settle rapidly within the near field.

The disturbance of sediments, noise and vibration during construction and operation also has the potential to indirectly impact on Cormorant (and shag) foraging activity through impacts on prey species including finfish and shellfish (Chapter 7). Chapter 7 concludes that the effects on local aquaculture and fisheries as a result of changes in sediment transport, elevated noise and vibration during construction and operation are predicted to be of 'Negligable Significance'. Changes in the availability (abundance and distributions) of Cormorant (and shag) finfish and shellfish prey items are therefore predicted to be Non-Significant.

### **6.3.2.6 ROI Carlingford Lough IBA**

The proposed Greenore terminal is partially located within the ROI Carlingford Lough IBA. The IBA Trigger Species comprise:

- Pale-bellied Brent Geese (315 individuals) and;
- Scaup (650 individuals);

Sections 6.3.2.1 and 6.3.2.4 already detail the impacts on Pale-bellied Brent Geese and Scaup. No additional impacts on the ROI Carlingford Lough IBA site are predicted.

**Table 6.24: Summary of Potential Impacts to the NI Carlingford Lough SPA**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	Construction (C)	Project Lifetime	Certain	No	Non-Significant (N.S)
Direct habitat loss to nesting Terns	-ve	Major	Very High	Very Large Adverse	C	Project Lifetime	Extremely Unlikely	No	N.S
Direct impacts to foraging Terns due to decreased water clarity	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Probable	Yes	N.S
Indirect impacts of food resource depletion to Pale-bellied Brent Geese	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Indirect impacts of food resource depletion to nesting Terns	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Direct noise and visual disturbance to overwintering Pale-bellied Brent Geese	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Probable	Yes	N.S
Direct noise and visual disturbance to nesting Terns	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Collision risk impacts with Brent Geese	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	No	N.S
Indirect habitat loss to Pale-	-ve	Major	Very High	Very Large Adverse	Operation (O)	Project Lifetime	Unlikely	No	N.S



Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
bellied Brent Geese									
Indirect habitat loss to nesting Terns	-ve	Major	Very High	Very Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Direct impacts to foraging Terns due to decreased water clarity	-ve	Intermediate	Very High	Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource depletion on Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource depletion on nesting Terns	-ve	Major	Very High	Very Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to overwintering Pale-bellied Brent Geese.	-ve	Intermediate	Very High	Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to nesting Terns.	-ve	Intermediate	Very High	Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Collision risk impacts with Brent Geese	-ve	Intermediate	Very High	Large Adverse	0	Project Lifetime	Unlikely	No	N.S

**Table 6.25: Summary of Potential Impacts to the ROI Carlingford Lough SPA**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	Construction (C)	Project Lifetime	Unlikely	No	Non-Significant (N.S)
Indirect impacts of food resource depletion to Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Direct noise and visual disturbance to overwintering Pale-bellied Brent Geese.	-ve	Intermediate	Very High	Very Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Collision risk impacts with Brent Geese	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	No	N.S
Indirect habitat loss to Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	Operation (O)	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource depletion on Pale-bellied Brent Geese	-ve	Major	Very High	Very Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to overwintering Pale-bellied Brent Geese.	-ve	Intermediate	Very High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Collision risk	-ve	Intermediate	Very High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
impacts with Brent Geese									

**Table 6.26: Summary of Potential Impacts to the Carlingford Lough ASSI**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to Wintering Waterbirds	-ve	Major	High	Very Large Adverse	Construction (C)	Project Lifetime	Certain	No	Non-Significant (N.S)
Direct impacts to Wintering Waterbirds due to decreased water clarity	-ve	Intermediate	High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	No	N.S
Indirect impacts of food resource depletion on Wintering Waterbirds	-ve	Major	High	Very Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Direct noise and visual disturbance to Wintering Waterbirds	-ve	Intermediate	High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Collision risk impacts with Wintering Waterbirds	-ve	Minor	High	Slight Adverse	C	Construction (Approx 6 month)	Unlikely	No	N.S
Indirect habitat loss to Wintering Waterbirds	-ve	Major	High	Very Large Adverse	Operation (O)	Project Lifetime	Unlikely	No	N.S
Direct impacts to Wintering Waterbirds due to decreased	-ve	Intermediate	High	Very Large Adverse	O	Project Lifetime	Unlikely	No	N.S

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
water clarity									
Indirect impacts of food resource depletion to Wintering Waterbirds	-ve	Intermediate	High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to Wintering Waterbirds	-ve	Intermediate	High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Collision risk impacts with Wintering Waterbirds	-ve	Minor	High	Slight Adverse	O	Project Lifetime	Unlikely	No	N.S

**Table 6.27: Summary of Potential Impacts to the NI Carlingford Lough IBA**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to roosting Cormorant	-ve	Major	Very High	Very Large Adverse	Construction (C)	Project Lifetime	Very Unlikely	No	Non-Significant (N.S)
Direct impacts to foraging Cormorant due to decreased water clarity	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Indirect impacts of food resource depletion on wintering Cormorant	-ve	Major	Very High	Very Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S
Direct noise and visual disturbance to wintering Cormorant	-ve	Intermediate	Very High	Large Adverse	C	Construction (Approx 6 month)	Unlikely	Yes	N.S

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Collision risk impacts to wintering Cormorant	-ve	Minor	Very High	Slight Adverse	C	Construction (Approx 6 month)	Unlikely	No	N.S
Indirect habitat loss to roosting Cormorant	-ve	Major	Very High	Very Large Adverse	Operation (O)	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource depletion to Cormorant	-ve	Major	Very High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to Cormorant	-ve	Intermediate	Very High	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Collision risk impacts to Cormorant	-ve	Minor	Very High	Slight Adverse	O	Project Lifetime	Unlikely	No	N.S

### 6.3.3 Non-Designated Sites for Nature Conservation

#### 6.3.3.1 Carlingford Lough Islands RSPB Nature Reserve

The nearest non-designated site for nature conservation with ornithological features of interest is the Carlingford Lough Islands RSPB Nature Reserve, which comprises Green Island, Blockhouse Island and the small nearshore islands off Greencastle Point. The RSPB currently manage and monitor the reserve due its importance for the Carlingford Lough SPAs nesting tern population.

Potential impacts on the Carlingford Lough SPA nesting tern population has already been discussed in Section 6.3.3 and are not re-addressed here. There is no proposed land take from the RSPB Nature Reserve as a result of this development.

### 6.3.4 Local Ornithological Interests

Potential impacts to local ornithological interests at Greencastle and Greenore are summarised in Table 6.28 and 6.29 respectively.

#### 6.3.4.1 Greencastle

Potential impacts to local ornithological interests at Greencastle are summarised in Table 6.28. All impacts detailed in Table 6.28 are predicted to be Non-Significant, provided mitigation and compensation outlined in Section 6.4 and 6.6 is adopted.

Overall the Greencastle development area is considered to be of low importance to wintering and breeding birds (Section 6.2.7; Appendix 6.5). The construction of the Greencastle terminal and widening of the Greencastle road is predicted to result in the loss of only a small number of terrestrial breeding bird territories (namely Blackbird, Chaffinch, Dunnock, Robin and Wren) due to the direct loss of hedgerow habitats (Section 6.2.7). This impact is considered temporary and Non-Significant provided mitigation and compensation outlined in Section 6.4 and 6.6 is adopted. Birds will temporarily be displaced into adjacent nesting habitat widespread throughout the wider Greencastle environs and will be able to return to removed habitats once reinstated.

Ringed Plover were not recorded nesting along the Greencastle shoreline and no direct land-take is proposed from the nearshore islands at Greencastle Point. Similarly Black Guillemots were not recorded nesting directly within the proposed Greencastle footprint but onboard an active tugboat. No impact as a result of direct nesting habitat loss is therefore predicted for either species.

Noise and visual disturbance during construction and operation is not predicted to have any significant impact on nesting Ringed Plover nesting on the offshore islands at Greencastle Point and also Oystercatcher known to nest on Green Island. Pedestrian activity on the Greencastle shoreline is not predicted to be considerably elevated above current levels as a result of the proposal and the birds are already relatively tolerant of disturbance from the Greencastle docks.

The crossing of the Carlingford Lough waters by the ferry and impact on divers, diving ducks, gulls and auks is predicted to be Non-Significant on due to the low numbers of birds recorded along the proposed ferry route (Section 6.2.7) and the nature of the proposed vehicle ferry. Collision risks with construction plant and the newly construction slipway are also predicted to be Non-Significant.

The disturbance of the sediments during construction and operation and changes in sediment transport regimes at Greencastle is predicted to be Non-Significant on foraging, roosting, nesting birds and their food resources. Potential noise and vibration impacts to prey species is also predicted to be Non-Significant.

All potential impacts above are not predicted to act in-combination with any likely impacts resulting from additional project or plans outlined in Chapter 3.

#### 6.3.4.2 Greenore

Potential impacts to local ornithological interests at Greenore are summarised in Table 6.29. All impacts detailed in Table 6.29 are predicted to be Non-Significant, provided mitigation and compensation outlined in Section 6.4 and 6.6 is adopted.

Overall the Greenore development area is considered to be of low importance to wintering birds (Section 6.2.7; Appendix 6.5). The construction of the Greenore terminal is predicted to result a small loss of terrestrial breeding bird territories (namely House Sparrow, Pied Wagtail, Robin, Swallow and Wren) due to the clearance of recolonising vegetation and disturbance of the old concrete store within Greenore Port. This impact is predicted to be temporary and Non-Significant provided mitigation and compensation outlined in Section 6.4 and 6.6 is adopted.

Ringed Plover were not recorded nesting along the Greenore no impact as a result of direct nesting habitat loss or disturbance is therefore predicted. A Black Guillemot colony (c.10 pairs) is well established at Greenore Port however, the construction of the Greenore terminal is not predicted to result in the direct loss of currently used nesting crevices. No impact as a result of direct nesting habitat loss is therefore predicted. Black Guillemots associated with the Greenore colony frequently foraged within the Greenore development areas however, the loss of potential foraging habitat as a result of slipway construction is predicted to be Non-Significant.

Noise and visual disturbance during construction and operation is not predicted to have any significant impact on nesting Ringed Plover nesting on the offshore islands at Greencastle Point and also Oystercatcher known to nest on Green Island. Pedestrian activity on the Greencastle shoreline is not predicted to be considerably elevated above current levels as a result of the proposal and the birds are already tolerant of disturbance from the Greencastle docks.

The disturbance of the sediments during construction and operation and changes in sediment transport regimes at Greencastle are predicted to be Non-Significant on foraging birds. Potential noise and vibration impacts to prey species are also predicted to be non-significant.

Potential disturbance impacts to breeding and wintering birds as a result of noise and visual disturbance during construction are predicted to be Non-Significant. This is due to the low numbers of birds recorded during the survey effort within Greenore development area (Section 6.2.7) and the distance of areas of high foraging activity to the south east and west.

The arrival and departure of the ferry during operation will subsequently introduce a regular but short disturbance to the Greenore shoreline. This is not predicted to have any significant impact on nesting Black Guillemot at Greenore Port, wetland birds using the shoreline within the vicinity of the built terminal including those roosting on the Greenore Breakwater. Birds already appear highly tolerant of existing port activities and the regular passing of cargo vessels.

All potential impacts above are not predicted to act in-combination with any likely impacts resulting from additional developments outlined in Chapter 3.

**Table 6.28: Potential Impacts to Local Ornithological Interests at Greencastle**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to wintering birds	-ve	Minor	Low - Very High (Annex 1)	Slight Adverse	C	Project Lifetime	Certain	No	N.S
Direct habitat loss to breeding birds	-ve	Minor	Medium (NI)	Slight Adverse	C	Project Lifetime	Certain	Yes	N.S
Indirect impacts of food resource depletion to birds	-ve	Intermediate	Low- Very High (Annex 1)	Large Adverse	C	Construction	Unlikely	Yes	N.S
Direct noise and visual disturbance to breeding birds	-ve	Minor	Medium (Amber)	Slight Adverse	C	Construction	Unlikely	Yes	N.S
Direct noise and visual disturbance to wintering birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	C	Construction	Unlikely	Yes	N.S
Collision risk impacts to birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	C	Construction	Unlikely	No	N.S
Indirect habitat loss to wintering birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	O	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource depletion to birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to wintering birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	O	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to	-ve	Minor	Medium	Slight Adverse	O	Project Lifetime	Unlikely	Yes	N.S



Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
wintering birds									
Collision risk impacts to birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	O	Project Lifetime	Unlikely	No	N.S
<b>Key to Table 6.28</b> Annex 1 - Due to presence of bird species listed on Annex 1 of The Birds Directive.									

**Table 6.29: Potential Impacts to Local Ornithological Interests at Greenore**

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
Direct habitat loss to wintering birds	-ve	Minor	Medium (Amber)	Slight Adverse	C	Project Lifetime	Certain	No	N.S
Direct habitat loss to breeding birds	-ve	Minor	Low	Slight Adverse	C	Project Lifetime	Certain	Yes	N.S
Indirect impacts of food resource depletion to birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	C	Construction	Unlikely	Yes	N.S
Direct noise and visual disturbance to breeding birds	-ve	Minor	Medium	Slight Adverse	C	Construction	Unlikely	Yes	N.S
Direct noise and visual disturbance to wintering birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	C	Construction	Unlikely	Yes	N.S
Collision risk impacts to birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	C	Construction	Unlikely	No	N.S
Indirect habitat loss to wintering birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	O	Project Lifetime	Unlikely	No	N.S
Indirect impacts of food resource	-ve	Intermediate	Very High (Annex 1)	Large Adverse	O	Project Lifetime	Unlikely	No	N.S

Potential Impact	Nature	Magnitude	Ecological Value of Feature	Significance of Impact	Phase of Occurrence	Duration	Likelihood of Occurrence	Mitigation Proposed	Significance of Residual Impacts
depletion to birds									
Direct noise and visual disturbance to wintering birds	-ve	Intermediate	Very High (Annex 1)	Large Adverse	0	Project Lifetime	Unlikely	No	N.S
Direct noise and visual disturbance to wintering birds	-ve	Minor	Medium	Slight Adverse	0	Project Lifetime	Unlikely	Yes	N.S
Collision risk impacts to birds	-ve	Minor	Very High (Annex 1)	Slight Adverse	0	Project Lifetime	Unlikely	No	N.S
<p><b>Key to Table 6.29</b>                      Amber - Due to presence of Amber-listed BOCCI                      Annex 1 - Due to the presence of species listed on Annex 1 of The Birds Directive</p>									

## 6.4 Mitigation

Mitigation of the identified potential impacts in Section 6.3 is addressed by both avoidance of impact and management or reduction of impact.

### 6.4.1 Designated Sites

#### 6.4.1.1 General Pollution Mitigation

Prior to the commencement of construction a CEMP will be prepared to assist the main contractor in preventing, managing and/or minimising significant environmental impacts during the construction phase.

Detailed mitigation as outlined in Chapter 8 (Water Quality) and Chapter 7 seeks to protect the water environment against the impacts of pollution and sedimentation. In doing so, it also protects the sensitive ecological resource of the study area within which birds feed, nest and roost.

The CEMP will be submitted to the Planning Authorities and relevant Statutory Nature Conservation Bodies for comment and approval prior to the commencement of the construction and operational phase.

#### 6.4.1.2 Impact-specific Mitigation

- **Bird Disturbance Impacts**

Measures to further minimise construction disturbance to wintering and breeding birds may be agreed in consultation with NIEA and NPWS. Such measures may include the installation of acoustic fencing around the immediate Greenore and Greencastle development area (as is already proposed in Chapter 11) to further reduce the level of perceived threat due to elevated noise and human presence disturbance.

### 6.4.2 Local Ornithological Features of Interest

#### 6.4.2.1 Pollution Mitigation

See Section 6.4.1.1.

#### 6.4.2.2 Impact-specific Mitigation

- **Bird Disturbance Impacts**

See Section 7.4.1.1.

- **Loss of Nesting Bird Habitat (Site Clearance)**

All breeding wild birds their nests, eggs and dependent young are protected in Northern Ireland and ROI under Articles of The Wildlife Order and The Wildlife Acts respectively. The presence of breeding birds within the proposed project footprint will therefore impose seasonal constraints on site clearance activities during the breeding bird season. In Northern Ireland there is no legally dated season during which an offence under The Wildlife Order may be committed. In ROI under Section 40 of The Wildlife Act (as amended by Section 40 of The Wildlife (Amendment) Act) it is an offence to destroy any vegetation during the period 1st March to the 31st August (inclusive) except for the purposes of agriculture or forestry. Vegetation loss shall be kept to a minimum but where required site clearance activities including the removal of any vegetation and the demolition (full or part) of any building or wall will be undertaken outside of the breeding bird season in line with Northern Irish and ROI legislation.

- The loss of hedgerows/stone walls along the Greencastle Pier Road to facilitate road widening will be kept to an absolute minimum, as outlined on road design drawings (Chapter 3). Approx 660m of hedgerow comprising native species in keeping with the setting of this rural road will be planted. The planting proposed will be specified by the contractor in the CEMP, which is subject to approval by the Planning Authority and Statutory Nature Conservation Bodies. Such

linear features provide important ecological corridors, foraging and nesting habitats for small mammals, birds and invertebrates.

## 6.5 Residual Effects

With the successful implementation of the above mitigation measures only residual impacts resulting from the loss of breeding bird territories remain.

## 6.6 Compensatory Measures

- **Loss of Swallow and House Sparrow Nesting Habitat**

House Sparrow nesting boxes and Swallow nesting cups should be installed on the retained concrete store at Greenore. The number and placement should be agreed in consultation with NPWS.

## 6.7 Enhancement Measures

Developments particularly those on Brownfield sites provide unique opportunities to build-in-biodiversity. Frazer Ferries Ltd. is committed to conserving, enhancing and promoting local biodiversity. The following enhancement measures have therefore been proposed on their behalf for consideration.

- **Black Guillemot Nest Tunnels**

The productivity of the Black Guillemot colonies at both Greenore and Greencastle appears to be currently limited by the availability of undisturbed nesting sites. At Greenore three purpose built nesting tunnels are currently installed on the existing breakwater. During 2012 all three nesting boxes were in use by breeding pairs, whilst remaining pairs attempted nesting within an un-used crane and drainage pipes on the main quay wall. Only those pairs using the breakwater nesting tunnels remained on their nests into July. At Greencastle in 2012 nesting pairs chose to nest on moored pilot boats in the shallow bay. Pairs likely failed due to intermittent use of these boats throughout the nesting season.

Both colonies would therefore benefit from the installation of purpose built nesting tunnels to enhance productivity. Suitable locations include the existing Greencastle Pier, Greencastle Docks, Greenore Breakwater and Greenore Port Quay Wall.

- **Swift Boxes**

Swifts were frequently recorded foraging within Greenore Port but were not subsequently recorded nesting. The installation of Swift boxes on the gable ends of the old concrete store to be retained within the Greenore development footprint would seek to increase the sites breeding bird diversity.

- **Green Island Remedial Measures**

The proposed development is not predicted to have any adverse impact on Green Island as a result of direct disturbance to nesting Terns or roosting Shag or Cormorant, or indirectly through exacerbated erosion and inundation. The provision of resources to local conservation projects including any remedial measures to Green Island, is however considered.

- **Information Boards**

Provision of information boards on the ornithological features of Carlingford Lough particularly featuring information on overwintering Pale-bellied Brent Geese, nesting Terns on Green Island and nesting Black Guillemots, would seek to enhance public interest in the conservation and responsible use of the Greenore and Greencastle Shorelines. Information boards may be produced in consultation with relevant stakeholders for installation at the terminals.

## 6.8 References

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