NATURA IMPACT STATEMENT

FOR

STRATEGIC HOUSING DEVELOPMENT

AT

CLAREMONT, HOWTH, CO. DUBLIN

November 2019

ON BEHALF OF

ATLAS GP LIMITED

Prepared by
Enviroguide Consulting

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1 INTRODUCTION

1.1 Background

Enviroguide Consulting were commissioned by Atlas GP Ltd. to carry out an Appropriate Assessment Screening, and subsequently a Natura Impact Statement, for a proposed strategic housing development at Claremont, Howth, Co. Dublin.

1.2 Legislative Context

Member States are required to designate Special Areas of Conservation (SACs) and Special Protected Areas (SPAs) under the EU Habitats and Birds Directives, respectively. SACs and SPAs are collectively known as Natura 2000 sites. An 'Appropriate Assessment' (AA) is a required assessment to determine the likelihood of significant impacts, based on best scientific knowledge, of any plans or projects on Natura 2000 sites.

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of SACs and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of SPAs. It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community.

An Appropriate Assessment is required under Article 6 of the Habitats Directive where a project or plan may give rise to significant effects upon a Natura 2000 Site, and paragraphs 3 and 4 state that:

"*6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site, in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

6(4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

This AA Screening Report was conducted within this legislative framework and the published Department of Environment, Heritage and Local Government 2009 guidelines - "Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG.

2009, Revised February 2010)". The directives are transposed into Irish legislation by the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

As outlined in these, it is the responsibility of the proponent of the project to provide a comprehensive and objective Screening for NIS, which can then be used by the competent authority in order to conduct Stage 2 Appropriate Assessment (DEHLG, 2009).

1.3 Stages of AA

The AA process is a four-stage process, with issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

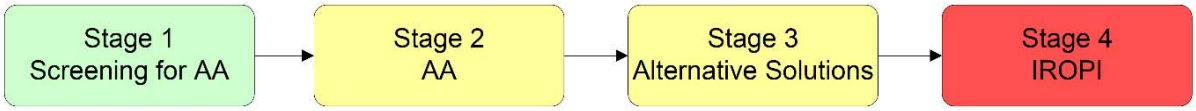

FIGURE 1. THE FOUR STAGES OF THE APPROPRIATE ASSESSMENT PROCESS (DEHLG, 2010).

The four stages of an AA, can be summarised as follows:

- Stage 1: *Screening*. The first stage of the AA process is to determine the likelihood of significant impacts of this proposal.
- **Stage 2: *Natura Impact Statement (NIS)***. The second stage of the AA process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 site, with respect to the conservation objectives of the site and its ecological structure and function. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.
- Stage 3: *Assessment of alternative solutions*. If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned. This stage examines alternative solutions to the proposal.
- Stage 4: *Assessment where no alternative solutions exist and where adverse impacts remain.* The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 site, where no less damaging solution exists.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the AA process to the point where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, a refusal for planning permission may be recommended. In this case, the project will generally only be

considered where no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test), or, in the case of priority habitats, considerations of health or safety, or beneficial consequences of primary importance for the environment or to other imperative reasons of overriding public interest. Then compensation measures are required for any remaining adverse effect.

2 CONCLUSION OF STAGE 1 SCREENING ASSESSMENT

The Appropriate Assessment Screening Report containing information for the purposes of Stage 1 Screening for AA is presented in a separate document with this application, the conclusions of which are presented below.

" *In conclusion, upon the examination, analysis and evaluation of the relevant information including, in particular, the nature of the Proposed Development and the likelihood of significant effects on any Natura 2000 site, in addition to considering possible in-combination effects, and applying the precautionary principles, it is concluded by the authors of this report that, on the basis of objective information, the possibility may be excluded that the proposed development will have a significant effect on any of the Natura 2000 sites listed below:*

- *North Dublin Bay SAC [000206]*
- *Rockabill to Dalkey Island SAC [003000]*
- *Ireland's Eye SAC [002193]*
- *Malahide Estuary SAC [000205]*
- *South Dublin Bay SAC [000210]*
- *Lambay Island SAC [000204]*
- *Rogerstown Estuary SAC [000208]*
- *Howth Head Coast SPA [004113]*
- *Dalkey Islands SPA [004172]*

However, upon the examination, analysis and evaluation of the relevant information including, in particular, the nature of the Proposed Development and the likelihood of significant effects on any Natura 2000 site, in addition to considering possible in-combination effects, and applying the precautionary principles, it is concluded by the authors of this report that, on the basis of objective information, the possibility may ***not*** *be excluded that the proposed development will have a likely significant effect on any of the Natura 2000 sites listed below:*

- *Baldoyle Bay SAC [000199]*
- *Howth Head SAC [000202]*
- *Ireland's Eye SPA [004117]*
- *North Bull Island SPA [004006]*
- *Baldoyle Bay SPA [004016]*
- *Malahide Estuary SPA [004025]*
- *Lambay Island SPA [004069]*
- *South Dublin Bay and River Tolka Estuary SPA [004024]*
- *Rogerstown Estuary SPA [004015]*

These Natura 2000 sites are assessed further as part of this NIS.

3 DESCRIPTION OF THE PROJECT

3.1 Description of Development

The proposed development will occur at a site bounded to the south by the Howth Road, to the east by a private dwelling, to the north by the DART line, and to the west by Local Authority lands. The site incorporates the former Techrete manufacturing facility, the former Beshoff's Motors showroom, and the former Howth Garden Centre.

The proposed development will include the demolition of all structures on site (c.8,162sqm GFA) and excavation of a basement. The proposed development comprises of the provision of a mixed use development of residential, retail/restaurant/cafe uses and a creche in 4 no. blocks (A to D), over part basement. Blocks A, B, C and D with a height up to a maximum of seven storeys of apartments over lower ground floor and basement car parking levels (a total of eight storeys over basement level). The residential component will consist of 512 no. residential units. The proposed development includes the provision of two vehicular entrances on to Howth Road, excavation of basement to provide for car parking, plant, waste storage and ancillary use. Additional car parking spaces shall be provided at lower ground floor level. A total of 439 no. car parking spaces and 1,335 no. bicycle parking spaces, including 49 no. bicycle spaces to cater for the retail units and creche shall be provided. One vehicular access is located at Block A, serving car parking spaces. The second is at Block C, providing access to the basement, residential and retail parking, and a service area for the retail units. A service route will be provided along part of the northern perimeter of the site with access from the western end of the site at a junction with Howth Road and at the main vehicular entrance at Block C;

A publicly accessible walkway/cycleway to the north of the site shall be provided at podium level. A civic plaza will be provided between Blocks D and C, and a landscaped park to the west of Block A. A channel to the sea for the Bloody Stream with associated riparian strip shall be incorporated as a feature within a designed open space between Blocks A and B. Communal gardens will be provided for Blocks A, B and C;

The residential component consists of 512 no. residential units, which includes 4 no. studio, 222 no. one bed, 276 no. two bed, 10 no. three bed apartments, and communal facilities of 708 sqm. Ground floor units onto the Howth Road will have own door access. The units will be served by balconies or terraces on all elevations;

Block A, with a maximum height of seven storeys of apartments over lower ground level car park (a total of eight storeys), will provide for 234 residential units, with residents' amenities to include a gym, residents' lounge, residents' support office, and 2 no. residents' multi-purpose rooms. Block B, with a maximum height of seven storeys of apartments over lower ground floor and basement car park (a total of eight storeys over basement), shall provide for 154 no. units, residents' lounge, residents' multi-purpose room, and creche of 236 sqm with outdoor play area. Own door access will be provided at ground floor. Block C, with a maximum height of seven storeys over basement car parking (a total of seven storeys) will provide for 83 no. residential units in two wings over a retail unit and Block D, with a maximum of 6 storeys over basement, shall provide for 41 no. residential units over retail units;

The commercial component in Blocks C and D consists of 4 no. units with 2,637 sqm gross floor area. In Block C, it consists of a 1,705 sqm anchor unit, accessed from the civic plaza. In Block D, it consists of a restaurant (243 sqm) and retail unit (603 sqm) and café (86 sqm). The restaurant and retail units are accessed from Howth Road, and the café is accessed from the upper level of the civic plaza.

The proposed development includes the provision of public and communal open space, green roofs, landscaping, boundary treatments, set down locations, substations, meter rooms, waste management and all ancillary site works, including upgrading of the public paths along Howth Road and relocation of bus stop in new setback with a bus shelter. Two set down areas are provided at either end of the site;

The gross floor area of the proposed development is 48,252 sqm (excluding enclosed car parking) on a site of 2.68 ha.

3.2 Existing Environment

The Proposed Development site is located along the north side of the Howth Road (R105) and is situated *c*.60m west of Howth DART Station. The site covers a total area of *c*.2.68ha and encompasses the former *Howth Garden Centre*, *Beshoff Motors* and *Techcrete* premises. The site borders the Howth Road to the south and the DART railway line to the north. Claremont beach is located *c.*30m to the north of the site and Howth Castle is situated *c.*260m to the south of the site.

The subject site is located within the townland of Howth Demense in Co. Dublin. Howth Demense and the wider area are located within the *Dublin* groundwater body. The overall status of this waterbody is recorded as *Good*. The bedrock is mapped as *Dinantian Pure Unbedded Limestones* and the sub-soil at the site is mapped as *man-made*. The site area is located on a *locally important* aquifer with groundwater vulnerability in the area listed as *Extreme*. Onsite boreholes logs (Golders (2019) *Interpretative Ground Investigation Report* describes the bedrock as fractured (become less fractured with depth) limestone with a honeycomb weathered structure in its upper layer becomes dolomitised (recalcified and veins) with depth.

The proposed development site is located within the Mayne River sub-catchment (*Mayne_SC_010*) and the *Howth_010* sub-basin. The Bloody Stream, or "Howth Stream" (*IE_EA_09H230880*) is mapped by the EPA as flowing through the western section of the site, from south to north. This watercourse is mapped as rising within the grounds of the Deer Park Hotel. It then flows northerly for *c*.1.2km to where it enters the proposed development site. The culverted watercourse passes underground through the project site for *c*.160m, where it then passes under the railway line and discharges into the Irish sea approximately 20m north of the site boundary via the Bob Davis culvert. The EPA does not have any operational monitoring stations on the Bloody Stream for biological water quality.

The Bloody Stream water quality was sampled as part of this planning application. The surface water laboratory results were screened against the European Communities Environmental Objectives (Surface Waters) 2009 and S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019 amendments, and European Communities (Quality of Shellfish Waters) 2006 at four locations, the full details can be found in Golders (2019) *Interpretative Ground Investigation Report.* Screening of surface water analysis results highlighted a number of screening level exceedances. The majority of determinants analysed did not report exceedances above Tier 1[1] screening values, the exceedances that were observed can be summarised as follows:

[1] Low level contamination.

- Total Polycyclic aromatic hydrocarbons (PAHs), there was 1 exceedance from 11 samples analysed;
- Ammoniacal Nitrogen (as N), there was 6 exceedances from 13 samples analysed.

The proposed development site was previously used by Techrete to produce pre-cast concrete elements for the construction industry, and to the eastern section Howth Garden Centre and Beshoff Motors (car sales). On-site investigations details there is no attenuation for storm flows or facilities to manage water quality before being discharged to the north of the proposed development site into Baldoyle Bay.

The proposed development site is approximately 90% hardstanding where all surface water is currently discharged into the Bloody Stream. This includes surface water from Howth Road. During site surveys, it was noted that the outfall of the Bloody Stream (Bob Davis Culvert) is maintained by a JCB digger accessing Claremont Strand, presumably to prevent sand infilling the culvert during the tidal cycle.

As mentioned above, the Site of the Proposed Development is primarily composed of hard-standing areas and disused industrial buildings. The following habitats (Fossitt, 2000) were identified within the proposed development site during the habitat survey: (for full details see Chapter 8 of the EIAR

- Buildings and artificial surfaces (ED3);
- Dry meadows and grassy verges (GS2) [unmanaged];
- Scrub (WS1);
- Hedgerows WL1);
- Depositing Lowland Rivers (FW2);
- Treelines (WL2); and
- Earth Banks (BL2).

A number of non-native species was recorded within the above habitats, some of which are considered to be invasive, namely: butterfly bush (*Buddleja davidii*), fuchsia (*Fuchsia magellanica*), montbretia (*Crocosmia x crocosmiiflora*) and hedge bindweed (*Calystegia sepium*).

The soil and underlying bedrock of the proposed development site was intrusive investigated by ground investigation by taking soil samples for laboratory analysis from boreholes and trial pits (see Golders (2019) *Interpretative Ground Investigation Report* for full details). The results showed that the majority of determinants analysed did not report exceedances above Tier 1[2] screening values, however some exceedances were recorded, and hot spots of contaminated soils. For example, exceedances were reported for the following parameters:

- Metals
    - Arsenic, 17 of the 132 samples analysed
    - Barium, 2 of the 132 samples analysed
    - Lead, 53 of the 132 samples analysed
    - Nickel, 17 of the 132 samples analysed
- PAHs
    - Napthalene, 2 of the 99 samples analysed
    - Benzo(a)anthracene, 2 of the 99 samples analysed

    - Benzo(a)pyrene, 16 of the 99 samples analysed
    - Dibenzo(ah)anthracene, 22 of the 99 samples analysed
    - Benzo(b)flouroanthene, 16 of the 99 samples analysed
- Tetrahydropyran (THPs)
    - Aliphatic C10 to C12, between 335.8mg/kg and 1,324.8mg/kg from all 120 samples analysed
- Polychlorinated Bipheny (PCBs)
    - Total PCB, 1 of the 120 samples analysed
- Asbestos
    - Asbestos fibre bundles, 24 of the 119 samples analysed.

Data from NPWS (2012c), Conservation objectives Support Document, Version 1 *Baldoyle Bay Special Protection Area* provides subsite roosting data from 2011, showing Claremont Strand (OUL 38 Howth Harbour in document) as a roosting location. The species that were recorded Roost in OUL 38 during the 25th November 2011 were:

- Black-Headed Gull;
- Common Gull;
- Herring Gull;
- Oystercatcher; and
- Ringed Plover.

The total number of birds roosting was recorded between 50-99 individuals, recorded at the tidal defence mound north of Claremont beach.

Data from NPWS (2012d), Conservation objectives Support Document – Marine Habitats Version 1 *Baldoyle Bay SAC* provides data of the habitat found along Claremont Strand, detailing that along Claremont stand and west wards is *Fine sand dominated by Angulus tenuis com- munity complex*. This community can be defined as largely that of fine sand which ranges from 63.9% to 93%; medium sand ranges from 0.4% to 30.1%. Negligible amounts of silt-clay and gravel are recorded within this complex. This community complex is distinguished by the bi- valve *Angulus tenuis* which occurs in high to moderate abundances here. The *bivalve Angulus fabula* and the polychaetes *Nephtys cirrosa, Scoloplos armiger, Sigalion mathildae, Lanice conchilega* are also recorded within this complex. The amphipod *Bathyporeia pelagica* and the bivalve *Donax vittatus* occur in high abundance at Claremont Beach.

Legend

- Special Area of Conservation
- Special Protection Areas
- Site Boundary
- Bloody Stream

Project

Natura Impact Statement for Strategic Housing Development, Howth, Co. Dublin

Client

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Title

Figure 2: Site Location

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a 3D Core C, Block 71, The Plaza, Park West, Dublin 12 D12F9TN
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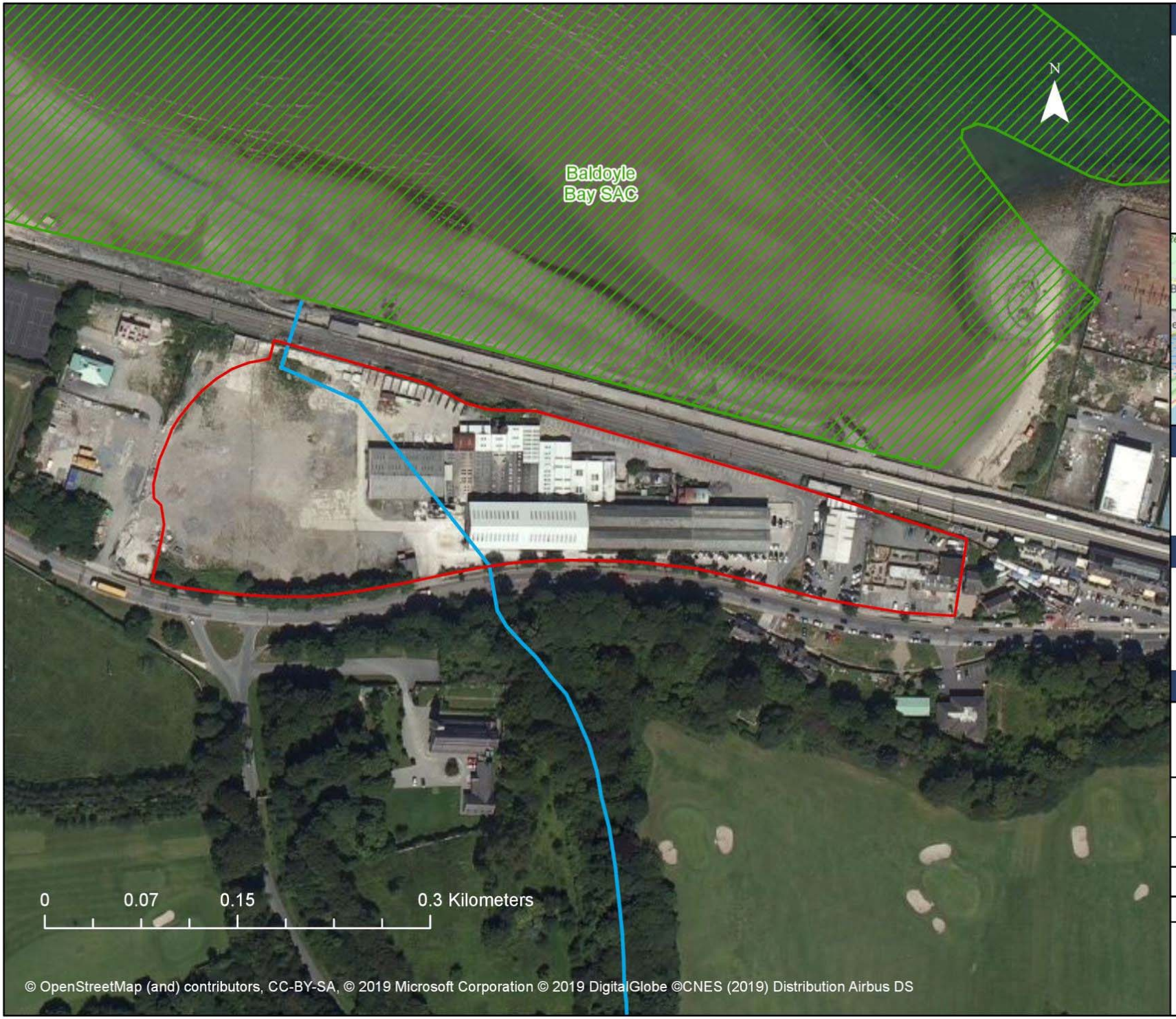
t +353 (0)1 565 4730

Drawn by: DW	**Projection:** WGS 1984 Web Mercator Auxiliary Sphere
Checked : JD	
Date: 09/07/2019	**Scale:** 1:25,430 @A4

Notes:

Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries.



Legend

- Site Boundary
- Bloody Stream
- Special Area of Conservation
- Special Protection Areas

Project

Natura Impact Statement for Strategic Housing Development, Howth, Co. Dublin

Client

ATLAS GP LIMITED

Title

Figure 3: Site Layout

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Drawn by: DW	**Projection:** WGS 1984 Web Mercator Auxiliary Sphere
Checked : JD	
Date: 09/07/2019	**Scale:** 1:4,000 @A4

Notes:

Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries.

4 METHODOLOGY

4.1 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources relevant for the completion of the Natura Impact Statement. The desktop study, completed in May 2019, relied on the following sources:

- Information on the network of Natura 2000 sites, relevant boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at *www.npws.ie* ;
- Information on the status of EU protected habitats and species in Ireland, obtained from the NPWS Article 17 reports (NPWS, 2013g & 2013h);
- Text summaries of the relevant Natura 2000 sites taken from the respective Standard Data Forms and Site Synopsises for each site, available at *www.npws.ie* ;
- Information on the habitats of Baldoyle Bay SAC, their distributions and distinguishing species from the Conservation Objectives supporting documents for the site;
- Information on the sensitivity of coastal/marine Annex I habitats to pressures arising from the proposed development, taken from the ABP Marine Environmental Research Ltd. series of documents entitled "*Tools for Appropriate Assessment of Fishing and Aquaculture Activities in Marine and Coastal Natura 2000 Sites*" (ABPmer, 2013);
- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at *www.maps.biodiversityireland.ie* ;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at *www.gis.epa.ie* ;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at *www.gsi.ie* ;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordinance Survey Ireland;
- Information on the extent, nature and location of the proposed development, provided by the applicant and their design team;
- Information on the construction methods to be followed as part of the proposed development obtained from the Construction Management Plan (BMCE, 2019a);
- Information on the location of the culverted section of the Bloody Stream within the proposed development site obtained from the relevant drawings;
- Information on the potential for flood events at the proposed development site, informed by the Flood Risk Assessment (BMCE, 2019b);
- The applicable 1% international population estimate figures for relevant SCI species taken from Wetlands International (2012);
- The applicable 1% national population estimate figures for relevant SCI species taken from Burke *et al.* (2018); and
- Data on the usage of coastal sites in Dublin by SCI species from the Irish Wetland Bird Survey (I-WeBS), a scheme that is funded by the National Parks and Wildlife Service of the Department of Culture, Heritage & the Gaeltacht and that is co-ordinated by BirdWatch Ireland.

The following guidance documents were consulted and followed in the completion of this Natura Impact Statement:

- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government, 2010);
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.* Circular NPW 1/10 & PSSP 2/10;
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2001); and
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2018).

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 10, References.

4.2 Field Surveys

An extensive suite of bird surveys was undertaken as part of this assessment and are described in detail below.

4.2.1 Wintering Bird Surveys

Wintering bird surveys were carried out at two sites in proximity to the proposed development location between November 2018 and March 2019. The extent of surveys areas for both these sites are depicted in Figure 4.

- Site 1 (primary): *Claremont Strand* – area of sand flats north of the proposed development site; and
- Site 2 (secondary): *Deer Park Golf Course* – areas of grassland habitat south of the proposed development site.

The aim of the wintering bird survey was to ascertain the composition, numbers and frequency of species utilising areas in proximity to the proposed development, in order to inform decisions on the potential for disturbance as a result of the Proposed Development.

Surveys at Claremont Strand were conducted in the form of eight individual hourly counts from two pre-defined vantage points on each survey day. Surveys were carried out bi-weekly from November to December 2018, and weekly from January to April 2019. A total of 125 hourly counts from 16 survey days[3] were carried out over the 2018/19 winter season.

Surveys of the grassland habitat at Deer Park Golf Course were undertaken on each survey day, with a total of 36 counts completed over 9 days between January and March 2019.

The wintering bird surveys were scheduled in order to cover over all permutations of tidal conditions and time of day throughout the 2018/19 winter season. All observations were recorded on 1:6,000 gridded field maps. Grids were chosen using available in-field landmarks in order to facilitate accurate recordings of flock locations. The following information was recorded at each hourly count:

[3] 1st November 2018; 22nd November 2018; 4th December 2018; 19th December 2018; 11th January 2019; 16th January 2019; 24th January 2019; 30th January 2019; 6th February 2019; 14th February 2019; 21st February 2019; 28th February 2019, 5th March 2019; 13th March 2019; 20th March 2019; and 30th March 2019.

- Species present;
- Number of birds;
- Activity (e.g. roosting, foraging); and
- Flock locations.

4.2.2 Flight-line Surveys

Flight-line surveys were carried out at the Site of the Proposed Development between November 2018 and April 2019. Methodology was adapted from Scottish Natural Heritage's survey methodology for assessment of onshore wind farms (SCH, 2014).

The aim of these surveys was to ascertain the composition, numbers, frequency and heights of species in passage over the proposed development site in order to inform decisions on potential disturbance to flight-lines of birds commuting to/from roost sites and/or between feeding sites as a result of the erection of the proposed structures.

A total of 37 twenty-minute observations were undertaken from a pre-determined vantage point over a total of 15 days[4] throughout the 2018/19 winter season. Surveys were concentrated at dawn and dusk in order to gather information on potential flight-lines of birds commuting to/from roost sites, but were also undertaken at various times throughout the day in order to gather information on potential flight-lines of birds commuting between feeding sites. The following information was taken for each recorded observation:

- Species;
- Number of birds;
- Flight direction;
- Estimated flight duration over proposed development site (0-5, 5-10. 10-15, 15-20, >20 seconds); and
- Estimated average height over proposed development site[5].

The flight-line surveys were concentrated on qualifying interests (QI) characterised as "poor" fliers and considered to be more at risk of collision (Eirgrid, 2012). A total of 10 twenty-minute observations were undertaken at dawn, 11 at dusk and 16 at various other times throughout the day over the 2018/19 winter season.

4.2.3 Other Field Surveys

A suite of additional ecological surveys was carried in relation to the Site of the Proposed Development between October 2018 and June 2019. This suite of surveys included:

- 2no. habitat & invasive species surveys;
- 2no. bat surveys (including roost inspection and activity); and
- 2no. breeding bird surveys.

[4] 1st November 2018; 22nd November 2018; 4th December 2018; 19th December 2018; 11th January 2019; 16th January 2019; 24th January 2019; 30th January 2019; 6th February 2019; 14th February 2019; 21st February 2019; 28th February 2019, 5th March 2019; 13th March 2019; and 20th March 2019.

[5] Heights were estimated based on relative heights to existing site buildings, i.e. <1, 1.5x, 2x etc. These estimations were then converted to actual measurements based on the known building heights.

These survey methodologies are not described in full here, as the site of the Proposed Development site is not within a Natura 2000 site, however these surveys methodology and results are discussed in full in the Biodiversity Chapter of the Environmental Impact Assessment Report that accompanies this planning application.

4.3 Consultation

The Department Application Unit (DAU) was sent the draft AA Screening Report and draft NIS on the 31st July 2019. A detailed response was received from the DAU on the 20th September 2019 and the following summarises the issues raised with regard to the NIS:

- The hydrological impacts of dewatering works on nearby SACs; this is assessed in Section 7.3.
- The current water quality status of the Blood Stream should be included in baseline conditions;
- An assessment of management requirements of the new Bloody Stream riparian zone at operational stage, given the hydrological connection to Baldoyle Bay SAC; this is assessed in Section 7.2.
- The impacts of removal of soil that is potentially contaminated should be assessed; this is addressed in Sections 8.2.3 and 8.2.4 particularly in the context of discharges to water.
- The impacts of HGVs travelling to and from the site and waste management facilities should be assessed; This is assessed in Section 7.1.3
- The impacts of future coastal flooding due to sea level rises associated with Climate Change should be assessed; This is addressed in section 8.3.5
- The impacts of increased night lighting of the development on the qualifying interests of Baldoyle Bay SAC and indirect impacts on special conservation interest bird species in nearby SPAs should be assessed; This is addressed in Section 8.3.4
- The NIS should include a number of wintering bird surveys and assess against the baseline data from Baldoyle Bay SAC Conservation Objectives Document (2011); These were carried out and are summarised in tables 2, 3 and 4, with full survey results data appended in Appendices II and III.
- The Department also suggested that an Ecological Impact Assessment (EcIA)[6] is also conducted. – This was carried out and forms the basis of the Biodiversity Chapter of the EIAR.

4.4 Limitations

Data presented in this report is from wintering bird surveys carried out over one season, 2018/19. It is possible that potential variation between seasons that has not been recorded would alter the results contained in this report. However, it is worth nothing that the winter season of 2018/19 was a good representative season, as it was a normal winter with no adverse weather conditions such as high impact storms. The data gather during the 2018/19 season is consistent with the data from NPWS (2012c), Conservation objectives Support Document, Version 1 *Baldoyle Bay Special Protection Area* provides subsite roosting data from 2011.

Wintering bird surveys covered the period of November 2018 to April 2019, and as such the use of survey sites by wintering birds during September/October has not been ascertained. However, the lack of data for these months is not considered to have impacted on the conclusions contained in this report. Peak numbers of wintering birds in Dublin are routinely recorded in the period November to February, with January usually recording the highest

numbers (I- WeBS data). The proposed development site is located adjacent to Baldoyle Bay SAC and an area of coastal habitat classified as “fine sand dominated by *Angulus tenuis* community com- plex”. Light-bellied Brent Geese are known to feed on *Zostera* spp. at coastal sites early in the winter, before subsequently utilising inland grassland sites later in the season. However, there are no *Zostera* beds within the survey sites or within proximity to the proposed development site (NPWS, 2012a & 2012b).

The height of birds recorded as part of the flight-line surveys were estimated based on comparison with existing site buildings. These measurements are therefore not exact and are prone to a degree of observer error. However, the height estimations are considered sufficient for the purposes of assessments contained in this report.

[6] An Environmental Impact Assessment Report (EIAR) has been developed as part of this planning application. The Biodiversity Chapter of this EIAR includes the assessments required for an EcIA

Legend

- Site Boundary
- Survey Sites

Project

Natura Impact Statement for proposed Residential Development at Howth Road, Howth, Co. Dublin.

Client

ATLAS GP LIMITED

Title

Figure 4 : Survey sites for wintering bird surveys

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Drawn by: DW	Projection: WGS 1984 Web Mercator Auxiliary Sphere
Checked : JD	
Date: 14/03/2019	Scale: 1:12,000 @A4

Notes:

Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries.

5 SUMMARY OF RELEVANT NATURA 2000 SITES

A summary of each of the European sites relevant for this assessment are given below; taken from the quality and importance section of the respective Natura 2000 Standard Data Form for each site.

5.1 Baldoyle Bay SAC

"*Site comprises a relatively small estuarine and bay system in north County Dublin. Receives the flows of the Mayne and Sluice rivers, both of which drain an agricultural / suburban catchment. The inner part of the site is sheltered from the sea by a large sand dune peninsula, though most of the dunes are now used as a golf course. Sediments in the inner sheltered areas are mostly muds or muddy sands, often with a high organic content. Part of the tidal section of the Mayne River and adjoining brackish marshes are included in the site. The outer part of the site is exposed to the open sea and the sediments here are predominantly well-aerated sands. In addition to the intertidal and salt marsh habitats, small areas of sand dunes and sandy beaches are included.*

A typical eastern estuarine system with fairly extensive intertidal sand and mud flats. Good diversity in sediment types. Has Zostera spp. Quality variable but generally good. Salt marshes are well represented and are at least of moderate quality. Has two Red Data Book plant species. Of importance for wintering waterfowl, with an internationally important population of Light-bellied Brent Goose, Branta bernicla horta and nationally important populations of a further 6 species including Golden Plover, Pluvialis apricaria and Black-tailed Godwit, Limosa lapponica. Little Tern, Sterna albifrons formerly bred."

5.2 Howth Head SAC

"*The climate and landforms of Howth combined with proximity to Dublin have resulted in a site of great scientific and education interest. The flora is very diverse with several Red data book species and species of very restricted Irish distribution. The dry heath and sea cliff vegetation is extensive and well developed. A wide variety of seabirds nest on the marine cliffs. Many important scientific studies of the area have been published*."

5.3 Ireland's Eye SPA

"*Ireland's Eye hosts an important seabird colony, with 11 species breeding regularly. It has nationally important populations of* Cormorant, *Phalacrocorax carbo,* Herring Gull*, Larus argentatus,* Great Black-backed Gull, *Larus marinus,* Kittiwake, *Rissa tridactyla,* Guillemot, *Uria aalge and* Razorbill, *Alca torda. In addition, the island has a recently established colony of* Gannet, *Sula bassana, which is one of only five in the country and the only one on the East coast. It also has regionally important populations of* Fulmar, *Fulmarus glacialis,* Shag, *Phalacrocorax aristotelis,* Black Guillemot*, Cepphus grylle and a small colony of* Puffin*, Fratercula arctica. It is a traditional site for* Peregine Falcon, *Falco peregrinus, though this species only breeds in some years. It supports two Red Data Book plant species, Crambe maritima and Hyoscyamus niger. The seabird colony is monitored annually*."

5.4 North Bull Island SPA

"*The site is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of* Light-bellied Brent Goose, *Branta bernicila hrota and* Bar- tailed Godwit *Limosa lapponica. A further 14 species have populations of national importance, with particular notable numbers of* Shelduck*, Tadorna tadorna (8.5% of national total),* Pintail, *Anas acuta (11.6% of national total),* Grey Plover, *Pluvialis squatarola (6.9% of national total),* Knot, *Calidris canutus (10.5% of national total). North Bull Island SPA is a regular site for passage waders such as* Ruff, *Philomachus pugnax,* Curlew Sandpiper*, Calidris ferruginea and* Spotted Redshank, *Tringa erythropus. The site supports Asio flammeus in winter. Formerly the site had an important colony of* Little Tern*, Sterna albifrons but breeding has not occurred in recent years. The site provides both feeding and roosting areas for the waterfowl species. Habitat quality for most of the estuarine habitats is very good. The site has a population of the rare Petalophyllum ralfsii which is the only known station away from the western seaboard as well as five Red Data Book vascular plant species and four bryophyte species. It is nationally important for three insect species. Wintering bird populations have been monitored more or less continuously since the late 1960s, and the other scientific interests of the site have also been well documented. Future prospects are good owing to various designations assigned to site*."

5.5 Baldoyle Bay SPA

"*Baldoyle Bay is a typical eastern estuarine system with fairly extensive intertidal sand and mud flats which have Zostera spp. It also has good salt marsh fringes where birds roost. The quality of habitats present is variable but generally good. The site supports a good diversity of wintering waterfowl and notably an internationally important population of* Light-bellied brent Goose, *Branta bernicla hrota. It has nationally important populations of* Shelduck, *Tadorna tadorna,* Pintail, *Anas acuta,* Ringed Plover, *Charadrius hiaticula,* Golden Plover, *Pluvialis apricaria,* Grey Plover, *Pluvialis squatarola and* Bar-tailed Godwit*, Limosa lapponica. At high tide the shallow waters regularly attract species such as* Great-crested Grebe *Podiceps cristatus* and Red-breasted Merganser, *Mergus serrator.* Little Tern, *Sterna albifrons formerly bred at the site, but not since the early 1990s*."

5.6 Malahide Estuary SPA

"*The site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has an internationally important population of* Light-bellied Brent Goose*, Branta bernicla hrota (4.8% of national total), and nationally important populations of a further 12 species. Of particular note are the populations of* Shelduck, *Tadorna tadorna (3.0% of national total),* Pintail, *Anas acuta (2.9% of national total),* Red-breasted Merganser, *Mergus serrator (2.8% of national total),* Grey Plover, *Pluvialis squatarola (2.7% of national total) and* Knot*, Calidris canutus (3.7% of national total). The site is one of the few in eastern Ireland where substantial numbers of* Long-tailed Duck*, Bucephala clangula occur. It has a regionally important population of Limosa lapponica. The site is an important and regular site for a range of autumn passage migrants, especially* Curlew Sandpiper, *Calidris ferruginea and* Ruff, *Philomachus pugnax. It supports a regular flock of non-breeding* Mute Swan, *Cygnus olor*."

5.7 Lambay Island SPA

"*Lambay is one of the most important seabird colonies in Ireland, with 12 species breeding regularly. It supports internationally important populations of* Cormorant, *Phalacrocorax carbo,* Shag*, Phalacrocorax aristotelis,* Guillemot *Uria aalge and* Razorbill, *Alca torda, and nationally important populations of* Fulmar, *Fulmarus glacialis,* Herring Gull, *Larus argentatus,* Lesser Black-backed Gull *Larus fuscus,* Great Black-backed Gull*, Larus marinus and* Kittiwake, *Rissa tridactyla. Cliff habitat for nesting seabirds is very extensive and of high quality. Other notable breeding birds are* Oystercatcher, *Haematopus ostralegus (largest concentration in the region),* Shelduck, *Tadorna tadorna and* Peregrine Falcon, *Falco peregrinus. The island supports a nationally important wintering flock of* Greylag Goose, *Anser anser and a range of other wintering waterfowl, though in relatively low numbers. Lambay is an important breeding site for Halichoerus grypus. The island was the subject of an intensive natural history study in 1905/06. Breeding and wintering birds are now well-monitored*."

5.8 South Dublin Bay and River Tolka Estuary SPA

"*The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of* Light-bellied Brent Goose, *Branta bernicla hrota, which feeds on Zostera noltii in the autumn. It has nationally important numbers of a further 6 species:* Oystercatcher*, Haematopus ostralegus,* Ringed Plover*, Charadrius hiaticula,* Knot, *Calidris canutus,* Sanderling, *Calidris alba,* Dunlin, *Calidris alpina and* Bar-tailed Godwit, *Limosa lapponica. It is an important site for wintering gulls, especially* Black-headed Gull, *Larus ridibundus and* Common Gull, *Larus canus. South Dublin Bay is the premier site in Ireland for* Mediterranean Gull *Larus melanocephalus, with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including Roseate Tern, Sterna dougallii,* Arctic Tern *S. hirundo and Common Tern, S. paradisaea*."

5.9 Rogerstown Estuary SPA

"*Rogerstown Estuary is a typical eastern estuary with fairly extensive intertidal sand and mud flats. Of high importance for wintering waterfowl, with an internationally important population of* Light-bellied Brent Goose, *Branta bernicla hrota that accounts for 5.9% of the national total. It supports nationally important populations of a further 15 species and notably* Knot*, Calidris canutus (8.6% of national total),* Shelduck*, Tadorna tadorna (5.3% of national total) and* Grey Plover, *Pluvialis squatarola (4.5% of national total). It is an important and regular site for a range of autumn passage migrants, especially* Little Stint, *Calidris minuta,* Curlew Sandpiper, *Calidris ferruginea,* Ruff, *Philomachus pugnax and* Spotted Redshank, *Tringa ochropus.* Little Tern, *Sterna albifrons has bred in the past but not recently. It includes populations of three Red Data Book plant species. Wintering birds are well monitored*."

5.10 Qualifying Interests and Conservation Objectives

The "favourable conservation status" of a habitat or species is defined by Articles 1(e) and 1(i) of the Habitats Directive as follows:

"*The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well*

as the long-term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

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

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

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

The qualifying interests and respective conservation objectives for each of the nine relevant Natura 2000 sites are detailed in Table 1 below.

TABLE 1. QUALIFYING INTERESTS AND CONSERVATION OBJECTIVES FOR RELEVANT NATURA 2000 SITES.

Site Name	Qualifying Interests	Conservation Objectives
Special Areas of Conservation (SACs)		
Baldoyle Bay SAC [000199]	- [1140] Mudflats and sandflats not covered by seawater at low tide	**Habitat Area** The permanent habitat area is stable or increasing, subject to natural processes. **Community Distribution** Conserve the following community types in a natural condition: Fine sand dominated by *Angulus tenuis* community complex; and Estuarine sandy mud with *Pygospio elegans* and *Tubificoides benedii* community complex.
	- [1310] *Salicornia* Mud - [1330] Atlantic Salt Meadows - [1410] Mediterranean Salt Meadows	**Habitat Area** Area stable or increasing, subject to natural processes, including erosion and succession. **Habitat Distribution** No decline, or change in habitat distribution, subject to natural processes. **Physical Structure: Sediment Supply** Maintain natural circulation of sediments and organic matter, without any physical obstructions. **Physical Structure: Creeks and Pans** Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession. **Physical Structure: Flooding Regime** Maintain natural tidal regime. **Vegetation Structure: Zonation** Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.

		Vegetation Structure: Vegetation Height Maintain structural variation within sward. **Vegetation Structure: Vegetation Cover** Maintain more than 90% of the area outside of the creeks vegetated. **Vegetation Composition: Typical Species and Sub-communities** Maintain range of sub- communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). **Vegetation Structure: Negative Indicator Species *Spartina anglica*** No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%.
Howth Head SAC [000202]	- [1230] Vegetated Sea Cliffs	**Habitat Length** Area stable, subject to natural processes, including erosion. Total length of cliff: 8.22km. **Habitat Distribution** No decline, subject to natural processes. **Physical Structure: Functionality and Hydrological Regime** No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures. **Vegetation Structure: Zonation** Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession. **Vegetation Structure: Vegetation Height** Maintain structural variation within sward. **Vegetation Composition: Typical Species and Sub-Communities** Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).

		Vegetation Composition: Negative Indicator Species Negative indicator species (including non-natives) to represent less than 5% cover. **Vegetation Composition: Bracken and Woody Species** Cover of bracken (*Pteridium aquilinum*) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%
	- [4030] Dry Heath	**Habitat Area** Area stable or increasing, subject to natural processes. **Habitat Distribution** No decline, subject to natural processes. **Ecosystem Function: Soil Nutrients** Maintain soil nutrient status within natural range. **Community Diversity** Maintain variety of vegetation communities, subject to natural processes. **Vegetation Composition: Lichens and Bryophytes** Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding *Campylopus* and *Polytrichum* mosses. **Vegetation Composition: Number of Positive Indicator Species** Number of positive indicator species present at each monitoring stop is at least two. Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath. **Vegetation Composition: Dwarf Shrub Composition** Proportion of dwarf shrub cover composed collectively of bog-myrtle (*Myrica gale*), creeping willow (*Salix repens*) and western gorse (*Ulex gallii*) is less than 50%. **Vegetation Composition: Negative Indicator Species**

		Total cover of negative indicator species less than 1% **Vegetation Composition: Non-Native Species** Cover of non-native species less than 1%. **Vegetation Composition: Native Trees and Shrubs** Cover of scattered native trees and shrubs less than 20% **Vegetation Composition: Bracken** Cover of bracken (*Pteridium aquilinum*) less than 10%. **Vegetation Composition: Soft Rush** Cover of soft rush (*Juncus effusus*) less than 10%. **Vegetation Structure: Senescent Ling** Senescent proportion of ling (*Calluna vulgaris*) cover less than 50%. **Vegetation Structure: Signs of Browsing** Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing. **Vegetation Structure: Burning** No signs of burning in sensitive areas. **Vegetation Structure: Growth Phases of Ling** Outside sensitive areas, all growth phases of ling (*Calluna vulgaris*) should occur throughout, with at least 10% of cover in the mature phase. **Physical Structure: Disturbed Bare Ground** Cover of disturbed bare ground less than 10%. **Indicators of Local Distinctiveness** No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

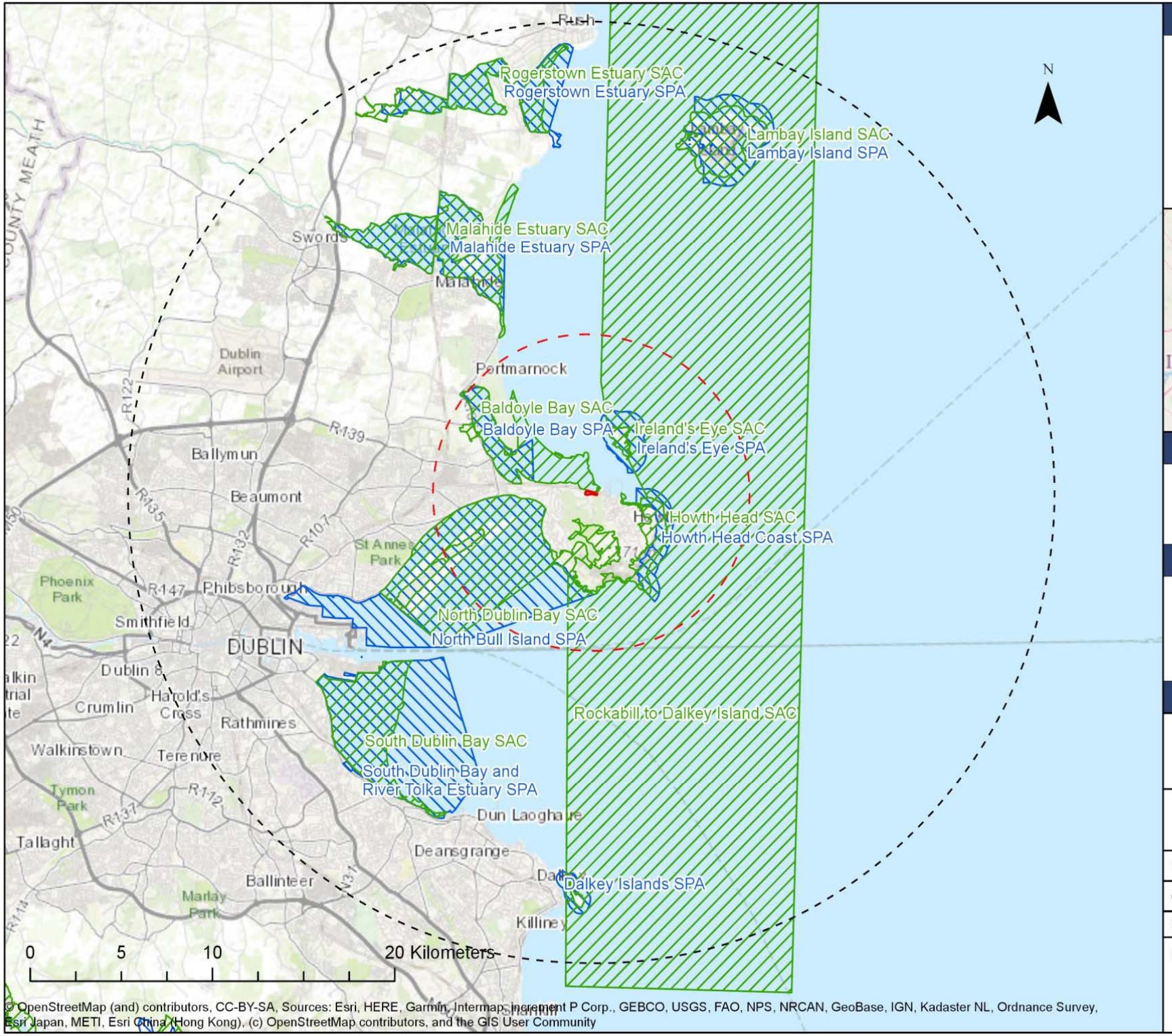
Special Protection Areas (SPAs)		
Ireland's Eye SPA [004117]	- [A017] Cormorant (*Phalacrocorax carbo*) [breeding] - [A184] Herring Gull (*Larus argentatus*) [breeding] - [A188] Kittiwake (*Rissa tridactyla*) [breeding] - [A199] Guillemot (*Uria aalge*) [breeding] - [A200] Razorbill (*Alca torda*) [breeding]	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.
North Bull Island SPA [004006]	- [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [wintering] - [A048] Shelduck (*Tadorna tadorna*) [wintering] - [A052] Teal (*Anas crecca*) [wintering] - [A054] Pintail (*Anas acuta*) [wintering] - [A056] Shoveler (*Anas clypeata*) [wintering] - [A130] Oystercatcher (*Haematopus ostralegus*) [wintering] - [A140] Golden Plover (*Pluvialis apricaria*) [wintering] - [A141] Grey Plover (*Pluvialis squatarola*) [wintering] - [A143] Knot (Calidris canutus) [wintering] - [A144] Sanderling (*Calidris alba*) [wintering] - [A149] Dunlin (*Calidris alpina*) [wintering] - [A156] Black-tailed Godwit (*Limosa limosa*) [wintering] - [A157] Bar-tailed Godwit (*Limosa lapponica*) [wintering] - [A160] Curlew (*Numenius arquata*) [wintering] - [A162] Redshank (*Tringa totanus*) [wintering] - [A169] Turnstone (*Arenaria interpres*) [wintering] - [A179] Black-headed Gull (*Chroicocephalus ridibundus*) [wintering]	**Population Trend** Long term population trend stable or increasing. **Distribution** No significant decrease in the range, timing or intensity of use of areas by *species*, other than that occurring from natural patterns of variation.
	- [A999] Wetland and Waterbirds	**Habitat Area** The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1,713 hectares, other than that occurring from natural patterns of variation.
Baldoyle Bay SPA [004016]	- [A046] Light-bellied Brent Goose (Branta bernicla hrota) [wintering]	**Population Trend** Long term population trend stable or increasing

	- [A048] Shelduck (Tadorna tadorna) [wintering] - [A137] Ringed Plover (*Charadrius hiaticula*) [wintering] - [A140] Golden Plover (*Pluvialis apricaria*) [wintering] - [A141] Grey Plover (*Pluvialis squatarola*) [wintering] - [A157] Bar-tailed Godwit (*Limosa lapponica*) [wintering]	**Distribution** No significant decrease in the range, timing or intensity of use of areas by *species*, other than that occurring from natural patterns of variation.
	- [A999] Wetland and Waterbirds	**Habitat Area** The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263 hectares, other than that occurring from natural patterns of variation.
Malahide Estuary SPA [004025]	- [A005] Great Crested Grebe (*Podiceps cristatus*) [wintering] - [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [wintering] - [A048] Shelduck (Tadorna tadorna) [wintering] - [A054] Pintail (*Anas acuta*) [wintering] - [A067] Goldeneye (*Bucephala clangula*) [wintering] - [A069] Red-breasted Merganser (*Mergus serrator*) [wintering] - [A130] Oystercatcher (*Haematopus ostralegus*) [wintering] - [A140] Golden Plover (*Pluvialis apricaria*) [wintering] - [A141] Grey Plover (*Pluvialis squatarola*) [wintering] - [A143] Knot (Calidris canutus) [wintering] - [A149] Dunlin (*Calidris alpina*) [wintering] - [A156] Black-tailed Godwit (*Limosa limosa*) [wintering] - [A157] Bar-tailed Godwit (*Limosa lapponica*) [wintering] - [A162] Redshank (*Tringa totanus*) [wintering]	**Population Trend** Long term population trend stable or increasing **Distribution** No significant decrease in the range, timing or intensity of use of areas by *species*, other than that occurring from natural patterns of variation.
	- [A999] Wetland and Waterbirds	**Habitat Area** The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 765 hectares, other than that occurring from natural patterns of variation.

South Dublin Bay and River Tolka Estuary SPA [004024]	- [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [wintering] - [A130] Oystercatcher (*Haematopus ostralegus*) [wintering] - [A137] Ringed Plover (*Charadrius hiaticula*) [wintering] - [A143] Knot (*Calidris canutus*) [wintering] - [A144] Sanderling (*Calidris alba*) [wintering] - [A149] Dunlin (*Calidris alpina*) [wintering] - [A157] Bar-tailed Godwit (*Limosa lapponica*) [wintering] - [A162] Redshank (*Tringa totanus*) [wintering] - [A179] Black-headed Gull (*Chroicocephalus ridibundus*) [wintering] -	**Population Trend** Long term population trend stable or increasing. **Distribution** No significant decrease in the range, timing or intensity of use of areas by *species*, other than that occurring from natural patterns of variation.
	- [A141] Grey Plover (*Pluvialis squatarola*) [wintering]	Grey Plover is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species.
	- [A192] Roseate Tern (*Sterna dougallii*) [passage] - [A193] Common Tern (*Sterna hirundo*) [breeding] [passage] - [A194] Arctic Tern (*Sterna paradisaea*) [breeding [passage]	**Passage Population: Individuals** No significant decline. **Distribution: Roosting Area** No significant decline. **Prey Biomass Available** No significant decline. **Barriers to Connectivity** No significant increase. **Disturbance at Roosting Site** Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns.
	- [A999] Wetland and Waterbirds	**Habitat Area**

		The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,192 hectares, other than that occurring from natural patterns of variation.
Lambay Island SPA [004069]	- [A009] Fulmar (*Fulmarus glacialis*) [breeding] - [A017] Cormorant (*Phalacrocorax carbo*) [breeding] - [A018] Shag (*Phalacrocorax aristotelis*) [breeding] - [A043] Greylag Goose (*Anser anser*) [wintering] - [A183] Lesser Black-backed Gull (*Larus fuscus*) [breeding] - [A184] Herring Gull (*Larus argentatus*) [breeding] [wintering] - [A188] Kittiwake (*Rissa tridactyla*) [breeding] - [A199] Guillemot (*Uria aalge*) [breeding] - [A200] Razorbill (*Alca torda*) [breeding] - [A204] Puffin (*Fratercula arctica*) [breeding]	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.
Rogerstown Estuary SPA [004015]	- [A043] Greylag Goose (*Anser anser*) [wintering] - [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [wintering] - [A048] Shelduck (*Tadorna tadorna*) [wintering] [breeding] - [A056] Shoveler (*Anas clypeata*) [wintering] - [A130] Oystercatcher (*Haematopus ostralegus*) [wintering] - [A137] Ringed Plover (*Charadrius hiaticula*) [wintering] - [A141] Grey Plover (*Pluvialis squatarola*) [wintering] - [A143] Knot (*Calidris canutus*) [wintering] - [A149] Dunlin (*Calidris alpina*) [wintering] - [A156] Black-tailed Godwit (*Limosa limosa*) [wintering] [passage] - [A162] Redshank (*Tringa totanus*) [wintering]	**Population Trend** Long term population trend stable or increasing. **Distribution** No significant decrease in the range, timing or intensity of use of areas by *species*, other than that occurring from natural patterns of variation.
	- [A999] Wetland and Waterbirds	**Habitat Area**

		The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 646 hectares, other than that occurring from natural patterns of variation.



Legend

- Site Boundary
- 15km Buffer
- 5km Buffer
- Special Area of Conservation
- Special Protection Areas

Project

Natura Impact Statement for proposed Residential Development, at Howth Road, Howth, Co. Dublin

Client

ATLAS GP LIMITED

Title

Figure 3: Natura 2000 sites within 15km of the proposed development.

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Drawn by: DW	**Projection:** WGS 1984 Web Mercator Auxiliary Sphere
Checked : JD	
Date: 14/03/2019	**Scale:** 1:280,000 @A4

Notes:

Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries.

6 RESULTS

6.1 Wintering Bird Surveys

6.1.1 Peak Counts

The peak counts of all qualifying interests (QI) recorded from all of the 125 hourly counts from November 2018 to April 2019 are given in Table 2 below. Peak counts from the 36 surveys undertaken at Deer Park Golf course are also shown. The applicable 1% national and international population estimate figures are taken from Lewis *et al.* (2019). National figures from Lewis *et al.* (2019) are based on records from the Irish Wetland Bird Survey (I-WeBS), a scheme that is funded by the National Parks and Wildlife Service of the Department of Culture, Heritage & the Gaeltacht and that is co-ordinated by BirdWatch Ireland; and international figures are based on records from Wetlands International (2012 & 2018).

TABLE 2. PEAK COUNTS FOR ALL SPECIES RECORDED DURING WINTERING BIRD SURVEYS FOR 2018/19 SEASON.

Species	BoCCI[7] Designation	Peak Count Recorded		1% National Threshold	1% International Threshold
		Claremont Strand	Deer Park Golf Course		
Herring Gull (*Larus argentatus*)	Wintering: Green Breeding: Red	959	46	**n/a[8]**	**14,400**
Great Black-backed Gull (*Larus marinus*)	Wintering: Green Breeding: Amber	97	1	**n/a[2]**	**3,600**
Black-headed Gull (*Larus ridibundus*)	Wintering: Green Breeding: Red	31	0	**n/a[2]**	**31,000**
Common Gull (*Larus canus*)	Wintering: Green Breeding: Amber	8	3	**n/a[2]**	**16,400**
Oystercatcher (*Haematopus ostralegus*)	Wintering: Amber Breeding: Amber	43	2	**610**	**8,200**
Curlew (*Numenius arquata*)	Wintering: Red Breeding: Red	28	47	**350**	**7,600**
Redshank (*Tringa totanus*)	Wintering: Red Breeding: Red	2	0	**240**	**2,400**
Greenshank (*Tringa nebularia*)	Wintering: Green Breeding: Green	5	0	**20**	**3,300**
Ringed Plover (*Charadrius hiaticula*)	Wintering: Green Breeding: Green	75	0	**120**	**540**

[7] Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013).
[8] I-WeBS typically does not record gull species sufficiently in order to be able to generate accurate 1% national figures.

Turnstone (*Arenaria interpres*)	Wintering: **Green** Breeding: **Green**	13	0	**95**	**1,400**
Dunlin (*Calidris alpina*)	Wintering: **Red** Breeding: **Red**	14	0	**460**	**13,300**
Light-bellied Brent Goose (*Branta bernicla hrota*)	Wintering: **Amber** Breeding: **n/a**	27	0	**350**	**400**
Cormorant (*Phalacrocorax carbo*)	Wintering: **Amber** Breeding: **Amber**	2	0	**110**	**1,200**

A total of 13 QI species were recorded at Claremont Strand and a total of 5 QI species were recorded at Deer Park Golf Course. The species with the highest peak count recorded was Herring Gull, with 959 individuals recorded on the 16th January 2019 at Claremont Strand. The next highest species peak count was Great Black-backed Gull, with 97 individuals recorded on 11th January 2019 at Claremont Strand.

6.1.2 Usage of Claremont Strand

No count of any species recorded during the wintering bird surveys exceeded the respective 1% national or 1% international population estimates (Lewis *et al.* 2019) on any of the 125 hourly counts over 16 survey days at Claremont Strand, from November 2018 to March 2019.

As expected, the numbers recorded at Claremont Strand were highest for most species around low tide mark and reduced significantly either side of high tide. Waders were recorded in relatively low numbers at the site for the given habitat type, with Oystercatcher and Curlew being the most frequently recorded. The tidal defence mound north of Claremont beach is used by various species as a high tide roost. Species frequently recorded roosting here close to high tide included Oystercatcher, Ringed Plover, Black-headed Gull, Herring Gull, Green-shank and Turnstone.

The species with the highest frequency, the highest average count and the highest peak count recorded at Claremont Strand was Herring Gull. Other QI species were overall recorded in comparatively low numbers. An analysis of the usage of Claremont Strand by QI species is detailed in Table 3 below.

TABLE 3. ANALYSIS OF USAGE OF CLAREMONT STRAND BY QI SPECIES FROM 2018/19 WINTERING BIRD SURVEYS.

Species	Frequency Recorded	Average Count	Peak Count	Peak Count % of National Population	Peak Count % of International Population
Herring Gull 1% National n/a 1% International 10,200	96.8% (121 of 125)	116.81	959	**n/a**	**0.07%**
Great Black-backed Gull 1% National n/a 1% International 4,200	77.6% (97 of 125)	17.88	97	**n/a**	**0.03%**

Black-headed Gull 1% National n/a 1% International 20,000	63.2% (79 of 125)	8.62	31	**n/a**	**0.001%**
Common Gull 1% National n/a 1% International 16,400	4.0% (5 of 125)	3.60	8	**n/a**	**0%**
Oystercatcher 1% National 610 1% International 8,200	85.6% (107 of 125)	11.90	43	**0.07%**	**0.005%**
Curlew 1% National 350 1% International 8,400	32.8% (41 of 125)	4.44	28	**0.08%**	**0.003%**
Redshank 1% National 240 1% International 3,900	29.6% (37 of 125)	1.14	2	**0.008%**	**0.001%**
Greenshank 1% National 20 1% International 2,300	24.8% (31 of 125)	2.06	5	**0.25%**	**0.001%**
Ringed Plover 1% National 120 1% International 730	14.4% (18 of 125)	23.06	75	**0.625%**	**0.139%**
Turnstone 1% National 95 1% International 1,400	25.6% (32 of 125)	6.28	13	**0.137%**	**0.009%**
Dunlin 1% National 460 1% International 13,300	2.4% (3 of 125)	12.67	14	**0.03%**	**0.001%**
Light-bellied Brent Goose 1% National 350 1% International 400	32.0% (40 of 125)	6.24	27	**0.077%**	**0.067%**
Cormorant 1% National 110 1% International 1,200	11.2% (14 of 125)	1.14	2	**0.018%**	**0.002%**

The peak count of 959 Herring Gull recorded at Claremont Strand on 16th January 2019 differs considerably with the overall average count of *c.*117 (Table 3). A comparison of the peak counts and average daily counts of Herring Gull recorded at Claremont Strand from all survey days is presented in Figure 6 below.

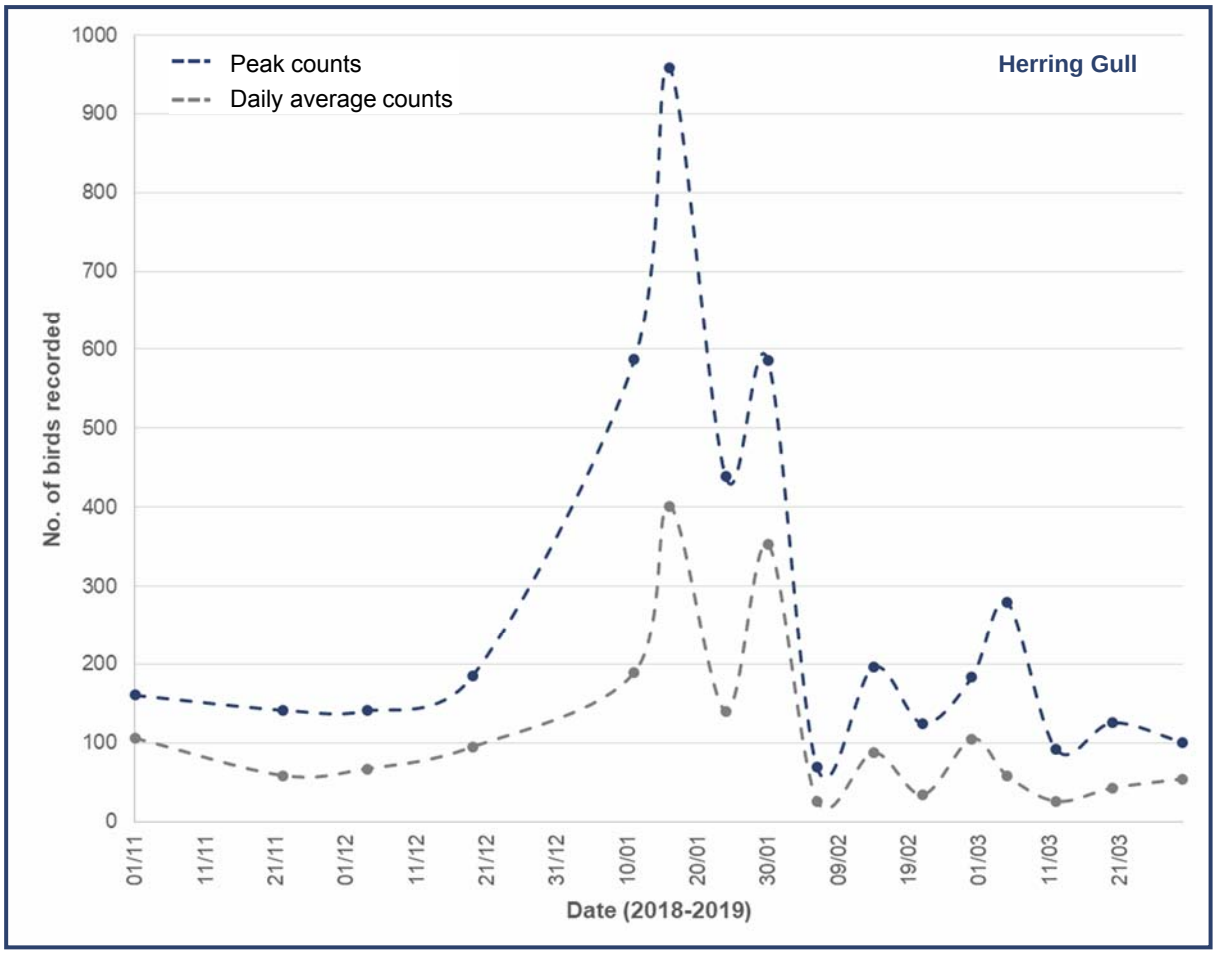

FIGURE 6. PEAK COUNTS AND DAILY AVERAGE COUNTS OF HERRING GULL RECORDED AT CLAREMONT STRAND DURING WINTERING BIRD SURVEYS.

Figure 7 below shows the total number of all waterbirds recorded over the tidal cycle from 125no. individual hourly counts undertaken at Claremont Strand during the 2018/19 winter season. It is apparent that the highest number of waterbirds were recorded at times of, or close to, low tide mark.

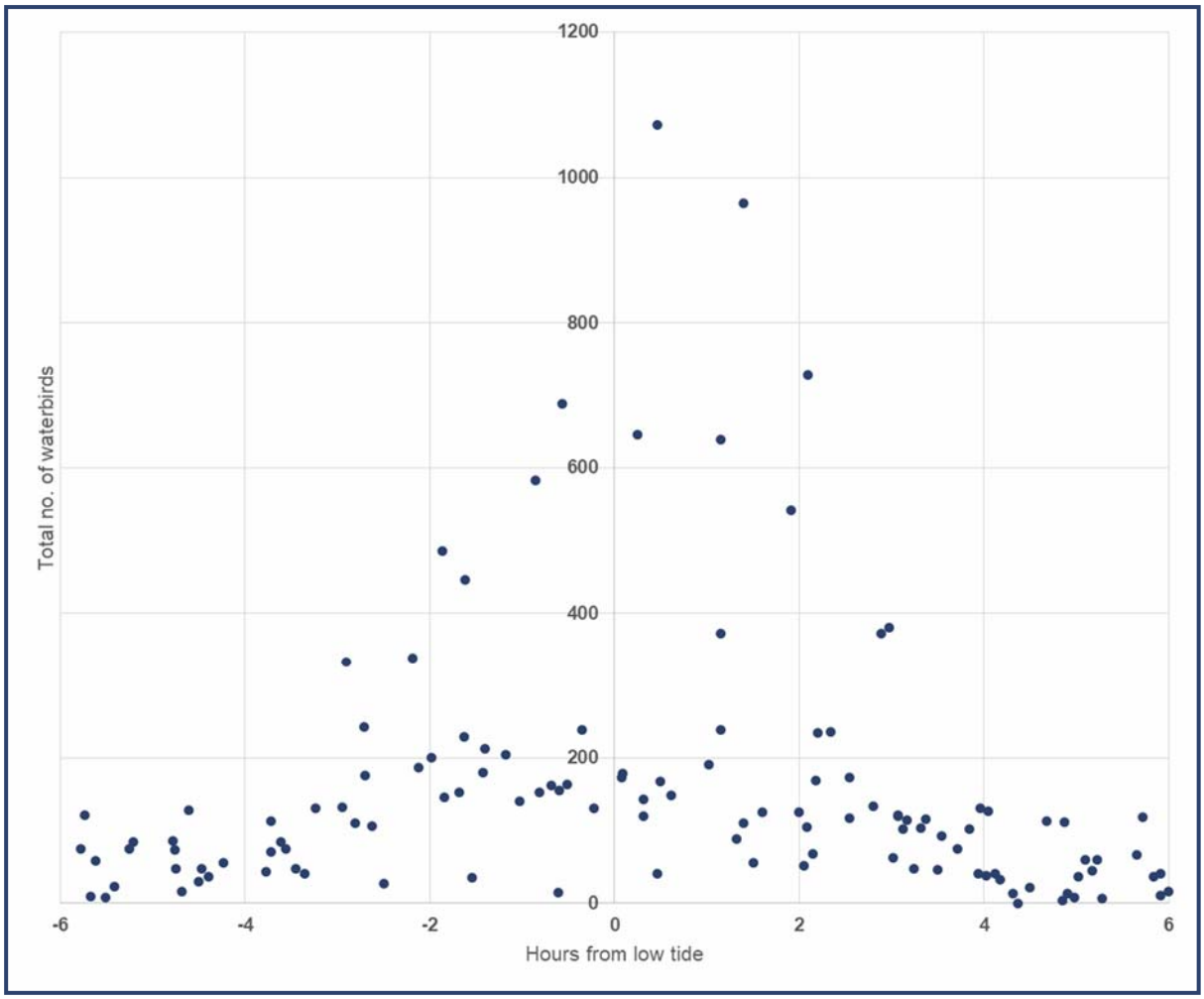

FIGURE 7. TOTAL NUMBER OF ALL WATERBIRDS RECORDED AT CLAREMONT STRAND OVER THE TIDAL CYCLE, FROM 125NO. INDIVIDUAL HOURLY COUNTS.

6.1.3 Usage of Deer Park Golf Course

No count of any species recorded during the wintering bird surveys exceeded the respective 1% national or 1% international (Lewis *et al.* 2019) population estimates on any of the 36 counts at Deer Park Golf Course, from January to March 2019.

The frequency of recording of QI species at the Deer Park Golf Course site was low overall. From the total 36 counts undertaken at the site over 9 days between January and March 2019, the frequency of recorded QI species was as follows:

- Herring Gull on 3 occasions (*c.*8%);
- Great Black-backed Gull on 1 occasion (*c.*3%);
- Common Gull on 1 occasion (*c.*3%);
- Oystercatcher on 2 occasions (*c.*6%); and
- Curlew on 5 occasions (*c.*14%).

Observations from surveys carried out at the site indicate that the area is routinely used by dog walkers and the sward height is likely too high in most of the site to be suitable for wintering birds normally associated with *ex-situ* grassland feeding sites.

6.1.4 Flight-line Surveys

The presence of all at-risk QI species in-flight over the proposed development site was recorded during 37 twenty-minute observations over 15 days between November 2018 and April 2019. A total of three at-risk QI species were recorded during the flight-line surveys: Curlew, Oystercatcher and Cormorant. A summary of the results of species recorded is given in Table 4 below, with full flight-line survey results provided in Appendix III.

TABLE 4. SUMMARY OF RESULTS OF AT-RISK QI SPECIES RECORDED IN-FLIGHT OVER PROPOSED DEVELOPMENT SITE FROM FLIGHT-LINE SURVEYS.

Species	Time of Day	Peak Count[9]	Frequency of Occurrence	Extrapolated rate of total individuals per hour[10]	Average estimated height over site[11]	Average estimated duration over site
Curlew (*Numenius arquata*)	Dawn	13	20% (2 of 10)	12.6 / hr	33 m	0 – 5 seconds
	Daytime	7	12.5% (2 of 16)	1.5 / hr	55 m	0 – 5 seconds
	Dusk	41	27.3% (3 of 11)	28.1 / hr	66 m	0 – 5 seconds
	Overall	**41**	**19% (7 of 37)**	**12.4 / hr**	**43 m**	**0 – 5 seconds**
Oystercatcher (*Haematopus ostralegus*)	Dawn	9	30% (3 of 10)	2.7 / hr	30 m	0 – 5 seconds
	Daytime	0	0% (0 of 16)	0 / hr	n/a	n/a
	Dusk	3	9.1% (1 of 11)	1.6 / hr	36 m	5 – 10 seconds
	Overall	**9**	**11% (4 of 37)**	**4.1 / hr**	**34 m**	**5 – 10 seconds**
Cormorant (*Phalacrocorax carbo*)	Dawn	3	10% (1 of 10)	0.9 / hr	40 m	5 – 10 seconds
	Daytime	0	0% (0 of 16)	0 / hr	n/a	n/a
	Dusk	0	0% (0 of 11)	0 / hr	n/a	n/a
	Overall	**3**	**3% (1 of 37)**	**0.2 / hr**	**40 m**	**5 – 10 seconds**

[9] Peak count of individuals recorded in-flight over the proposed development site from all twenty-minute observation periods.
[10] Based on records from a total of 10 dawn, 16 daytime & 11 dusk individual twenty-minute observations between November 2018 and March 2019.
[11] The heights of recorded flights over the proposed development site were estimated based on the relative heights to existing site structures.

The overall frequency of at-risk QI species recorded in-flight over the proposed development location during the flight-line surveys from November 2018 to March 2019 was low. Curlew were overall recorded in-flight over the proposed development on 7 of the total 37 twenty minute observations (*c.*19%), Oystercatcher on 4 occasions (*c.*11%) and Cormorant on one occasion (*c.*3%).

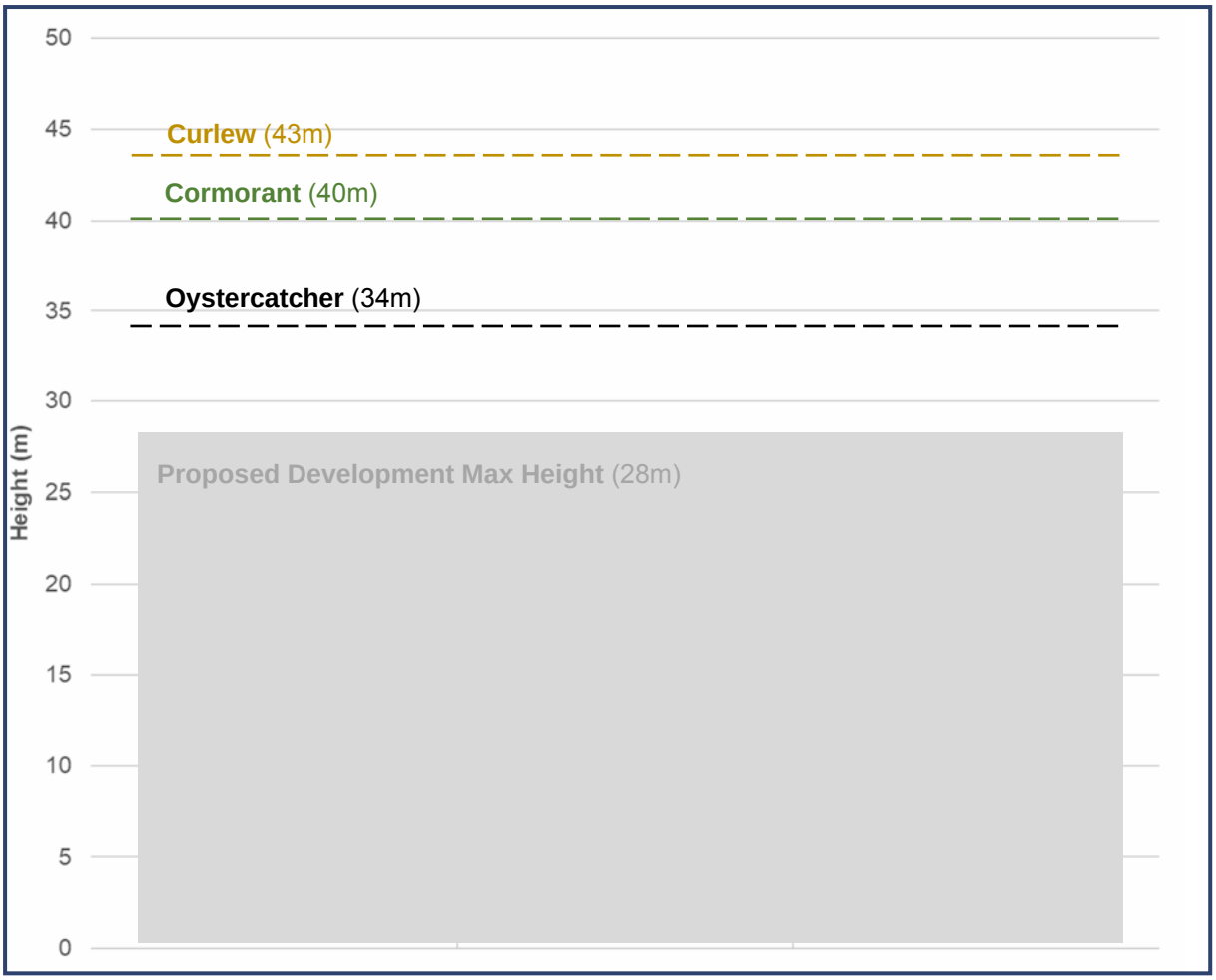

FIGURE 8. AVERAGE RECORDED FLIGHT HEIGHTS OF AT-RISK QI SPECIES IN RELATION TO MAX HEIGHT OF PROPOSED DEVELOPMENT STRUCTURES.

The number of individuals in these flocks recorded in-flight over the proposed development was also considered to be low. The average flock size of Curlew recorded in-flight over the proposed development was 9.2 individuals, Oystercatcher was 3.8 individuals and Cormorant was 3 individuals. The overall extrapolated hourly rate of individuals in-flight over the proposed development site for Curlew was 12.4/hr, Oystercatcher 4.1/hr and Cormorant 0.2/hr.

In addition, the average flight height of the three at-risk QI species recorded during the flight-line surveys were all greater than the maximum height of the proposed development structures of *c.*28m; i.e. Curlew 43m, Cormorant 40m and Oystercatcher 34m (see Figure 8).

7 MITIGATION MEASURES

The following mitigation measures have been agreed in consultation with Barrett Mahony Consulting Engineers and Walls Construction. The below text is taken from the Construction Management Plan (BMCS, 2019a), Flood Risk Assessment Report (BMCE, 2019b) and Outline Construction Environmental Management Plan (OCEMP Enviroguide 2019) which are submitted with this application.

7.1 Disturbance

7.1.1 Noise

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing

A potential impact on the qualifying interests of seven SPAs (Ireland's Eye SPA, North Bull Island SPA, Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay and River Tolka Estuary SPA, Lambay Island SPA and Rogerstown Estuary SPA) was identified from noise generated during the Construction Phase of the Proposed Development which has the potential to cause temporary disturbance to a number of the qualifying interests of the above mentioned seven SPAs.

The conservation objective attributes for each of the qualifying interests of the above seven SPAs are "Population Trend" and "Distribution". The target for the conservation objective attribute of "Population Trend" for each of the relevant qualifying interests is defined as "long term population trend stable or increasing". The target for the conservation objective attribute of "Distribution" for each of the relevant qualifying interests is defined as "no significant decrease in the range, timing and intensity of use of areas by [relevant species], other than that occurring from natural patterns of variation".

The peak count of each of the species recorded at Claremont Strand from 125 individual hourly counts was significantly below the respective 1% national and international population estimate thresholds. While it is possible that acute high-volume noises that may be generated during the temporary construction phase of the proposed development have the potential to disturb flocks of wintering birds at Claremont Strand, any disturbance caused will not adversely impact on the conservation objective attributes of "Population Trend" and "Distribution" due to the following:

- The insignificant numbers of the birds recording utilising these areas during the winter. The overall average counts of each of the species recorded in relation to the respective national population estimates is 0.14%;
- The short-term (2 years) duration of the construction phase in terms of any resulting noise generated; and
- The measures included as part of the Construction Management Plan in relation to noise control.

Noise control audits will be conducted at regular intervals through the construction phase of the development. In the first instance it is envisaged that such audits will take place monthly. This subject to review and the frequency of audits may be increased if deemed necessary. The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions. To this end, the CEMP will implement measures to address the following:

- Hours of operation being correctly observed;
- Opportunities for noise control 'at source';
- Optimum siting of plant items;
- Plant items not being left to run unnecessarily;
- Correct use of proprietary noise control measures;
- Materials handling;
- Good maintenance; and
- Correct use of screening provided and opportunities for provision of additional screening.

7.2 Dust

A potential impact from the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m.

Dust deposition impacts on Biodiversity can occur due to chemical or physical effects. These include, reduction in photosynthesis due to smothering from dust on the plants and chemical changes such as acidity to soils. Often impacts will be reversible once the works are completed, and dust deposition ceases.

The potential for dust to be emitted will depend on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speed and wind direction. As indicated, dust generation rates depend on the site activity, particle size (in particular the silt content, defined as particles smaller than 75 microns in size), the moisture content of the material and weather conditions. Dust emissions are dramatically reduced where rainfall has occurred, due to the cohesion created between dust particles and water and the removal of suspended dust from the air. It is typical to assume no dust is generated under "wet day" conditions where rainfall greater than 0.2mm has fallen. Information collected from Dublin Airport Meteorological Station (1981 - 2010) identified that typically 191 days per annum are "wet" which would indicate that for over half of the year conditions are favourable to dust suppression.

Large particle sizes (greater than 75 microns) fall rapidly out of atmospheric suspension and are subsequently deposited in close proximity to the source. Particle sizes of less than 75 microns are of interest as they can remain airborne for greater distances and can give rise to the potential dust nuisance at the sensitive receptors. This size range is broadly be described as silt. Emission rates are normally predicted on a site-specific particle size distribution for each dust emission source.

Whilst construction activities are likely to produce some level of dust during earth moving and excavating phases of the development, these activities will mainly be confined to particles of dust greater than 10 microns. Particles of dust greater than 10 microns are considered a nuisance but do not have the potential to cause significant deposition on the surround habitats (i.e. Claremont Strand). Furthermore, the dust minimisation measures detailed below and in

the Construction Management Plan fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

7.2.1 Dust Minimisation Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors, including Claremont Strand. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (BRE 2003), (The Scottish Office 1996) (UK Office of Deputy Prime Minister 2002) and the USA (USEPA 1997), (USEPA 1986).

7.2.1.1 Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person accountable for air quality and dust issues on the site boundary.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

7.2.1.2 Site Management

- Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road net- work routes.

7.2.1.3 Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including

roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

7.2.1.4 Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as de- scribed below.
- Covered stockpiles to prevent wind whipping.

7.2.1.5 Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 20 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

7.2.1.6 Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

7.2.1.7 Measures Specific to Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust)
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can

be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

7.2.1.8 Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

7.2.1.9 Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

7.2.1.10 Measures Specific to Trackout

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80%.

- A speed restriction of 15 km/hr will be applied as an effective control measure for dust for on-site vehicles.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

7.2.1.11 Dust Control – Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures.

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered with tarpaulin always to restrict the escape of dust;
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- If practicable, a wheel wash facility will be employed at the exit of the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain.

7.3 Traffic

7.3.1 Impacts on Air Quality at Designated sites

Dust

The report carried out by AWN in relation to the proposed development states the following:

"The Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on local air quality, dust being the exception to this.

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m."

All of the Natura 2000 sites discussed in the NIS for this proposed development, except for Baldoyle Bay SAC, are located outside of the above 200m deposition zone. As such, adverse dust related impacts on air quality at designated sites, associated with the construction phase of the proposed development, are not expected to be significant. Baldoyle Bay SAC is located *ca.* 20m from the proposed development site and so is within this initial dust deposition zone. However, the above report states the following:

"*Most importantly, when the dust minimisation measures detailed in the Construction Management Plan, the CEMP and Appendix 6.3 are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors."*

Traffic-related Pollution

The increased traffic associated with the servicing of the construction site by HGVs during the construction phase of the proposed development also has the potential to contribute to adverse impacts on local air quality, including that of Baldoyle Bay SAC and North Dublin Bay SAC, along impacted road links leading to and from the proposed development site.

AWN describes the traffic-related risk as follows:

"… traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, benzene and PM_{10}. Impacts from these emissions have been screened using the UK DMRB guidance (UK Highways Agency 2007), on which the TII guidance was based. This guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- *Road alignment change of 5 metres or more;*
- *Daily traffic flow changes by 1,000 AADT or more;*
- *HGV flows change by 200 vehicles per day or more;*
- *Daily average speed changes by 10 km/h or more; or*
- *Peak hour speed changes by 20 km/h or more.*

As the number of HGVs servicing the proposed development site will not come close to exceeding the 200 per day limit described above, AWN conclude that a further assessment of construction phase-traffic related impact on air quality is not required:

"The proposed development increase in construction phase HGVs will be a maximum of 80 HGVs per day. The AADT volume, speeds or road alignment do not change by an amount greater than the criteria discussed above. Therefore, none of the road links impacted by the proposed development satisfy the above criteria and an assessment of the impact of traffic emissions on ambient air quality during the construction phase is not necessary".

7.4 Surface Water

During the excavation phase, the Bloody Stream will be re-routed. The stream will continue to flow underground in a 750mm diameter pipe diversion until the development is complete. This eliminates the possibility of contamination from the works above. To ensure no damage from construction related activity above the pipes they will be encased in 150mm concrete

Based on the previous approved application for the site, the scheme intends to open-up the Bloody Stream circa 30m west of manhole S5 and create a landscaped riparian strip. This will enhance the Proposed Development landscape and the surrounding areas.

When the stream was being culverted, the levels were restricted by the 300mm dia. foul sewer on the south side of the Howth Road as well as the requirement to go under the railway line using the Historical Bob Davis culvert. This sewer has since been decommissioned and was replaced by a considerably deeper (5m-6m) 450 mm dia. sewer in the centre of Howth Road.

The invert level at the existing manhole at the location of the proposed new manhole S6 is 1.25m (ground level circa 4.0m). As a result of the decommissioning of the 300mm diameter sewer in the road and the new deeper 400mm diameter sewer the opportunity exists to raise the stream as it traverses the site, above its current culverted level by over a meter, making the invert level at S4 - 2.230m. Normal spring tides come to 2.52m without coastal surcharge and exceptional tides come to 3.34m without allowance for sea level rises. The raising of the level brings it out of the normal tidal range and will facilitate the landscaping plan to make it an amenity.

With regards to the public sewer on the northern boundary, the Bloody Stream will flow above the public sewer. The site survey carried out showed the pressure main top of concrete (TOC) at 2.360m OD at a gradient of 1:150. Based on this, the point of intersection between the foul pressure main and the Bloody Stream, the TOC will be at 1.93m OD. This is sufficient to allow the stream pass above at an invert level of 2.13m OD.

Due to high tides sediment builds-up at the mouth of the Bob Davis Culvert on entry to Baldoyle Bay can be an issue and was the reason for one of the flood in the Techrete site reported in 2004. To resolve this, it is planned to dredge the existing culvert, and the base lined to a 1:75 fall. This gradient will force the water to flow at a faster rate and thereby naturally clearing sediment build up on exit.

By raising the bed level there are several benefits:

- Significant reduction in the number of times high tide will enter the stream bed. Based on 2018 figures, there were 13 high tides, of this only two would have entered the channel.
- The depth of the stream at extreme tides reduces from 2m to 1m deep. Based on 2018 information the maximum stream depth would have been 650mm.
- It significantly reduces the number of tides entering the channel enhancing the water quality of the stream.
- Results from the site investigations show the water table to be around 2.0m O.D (2m below current ground level). The open channel will start at 2.350m O.D, therefore above the water table.
- The new gradient in the Bob Davis Culvert will result in lower maintenance requirement as the higher velocity stream will reduce the sediment build up on entering Baldoyle Bay.

Post construction, the Bloody Stream will un-culverted through the site and a riparian strip created.

The riparian strip will be one of the last areas to be completed. This will involve, construction of an open concrete channel spanning the breadth of the site, underground drainage connections at either end, a settlement chamber and landscaped banks on either side of the channel. The riparian strip will be of varying width, with graded 1:3 banks on either side. Before the streams channel disappears under the raised walkway and outfall into the sediment chamber located under the access road at rear of the development. A grate will be fitted over the outfall drain in the pond, which will stop any debris entering the culvert. To

ensure water is always present in the pond, it will be set at a lower level to the outfall. By doing this it will slow the pace of the river and act as a sediment chamber.

7.5 Groundwater

Shallow groundwater may be encountered during the construction works in particular the basement excavation. Where water must be pumped from the excavations, water will be managed in an in accordance with best practice standards (i.e. CIRIA – C750) and regulatory consents. Water will not be discharged to open water courses (e.g. the Bloody Stream or shore) and will be disposed to foul sewer.

Groundwater elevations recorded by Golder (Golder, 2019a) ranged from 1.05mOD (BH05) to 1.7mOD (BH09) on the 13th of September 2019 and from 1.13mOD (BH06) to 1.76mOD (BH09) on the 18th of September 2019 and that groundwater beneath the Site flows down-gradient to the north to Baldoyle Bay.

As documented in the Golder environmental assessment reports (Golder, 2019a and 2019b), tidal monitoring data collected from monitoring locations BH02 and BH05 indicate that the groundwater elevation is constantly higher to the south of the Site and lower towards the coast, consistent with a northerly direction of groundwater flow and discharge of groundwater to Claremont Strand. The tidal monitoring data also suggests that tidal influence underlying the Site may be greater in boreholes (and thus groundwater body) closer to the coast.

Golder (Golder, 2019a and 2019b) also conclude that there is strong indication there is vertical hydraulic continuity between bedrock, superficial deposits and made ground groundwater (where encountered) which is to be expected based on the stratigraphy encountered at the Site in the site investigation locations (hydraulic continuity from approximately 2.0mBGL to 3.0mBGL and into the bedrock, and there is no evident perched (separate) groundwater body). Hence, groundwater is considered to be in hydraulic continuity between the Site and Baldoyle Bay.

Disposal to sewer will require, a consent/licence issued under Section 16 of the Local Government (Water Pollution) Acts and Regulations and must be obtained from Irish Water. Any such discharge licence is likely to be subject to conditions regarding the flow (rates of discharge, quantity etc.); effluent quality prior to discharge and pre-treatment (e.g. settlement/filtration, hydrocarbon separation etc.) and monitoring requirements. All dewatering will be undertaken in strict compliance with the conditions of the discharge licence for the project.

A treatment system will be installed for the duration of the project to meet the requirements of the discharge licence but will typically include a number of stages of settlement and filtration to remove sludge, suspended solids, free-phase hydrocarbons (oils) and dissolved phase hydrocarbons.

A monitoring programme will be implemented to ensure that water quality criteria set out in the discharge licence are achieved prior to discharging to the sewer.

All excavations will be encompassed by secant pile wall around the basement excavation to allow dewatering and dry excavation. Extracted groundwater will be treated on site and disposed to sewer only under a temporary discharge consent. To achieve this disposal route, a temporary water treatment facility (including holding tanks) will be constructed on the site, and other apparatus as required to ensure the conditions of the temporary discharge consent are met (this will include activated carbon filtration, siltbusters etc.). Water is anticipated to be treated and pumped to a holding area and sampled and tested by the Contractor prior to discharge. Upon receipt of analysis results and screening against required consent limits, the Contractor will arrange the appropriate disposal, with the groundwater treated and discharged to foul sewer in accordance with temporary discharge consent (to be arranged by the Contractor).The Contractor is to ensure that no contaminated water/liquids leave the site (as

surface water run-off or otherwise), enter the local storm drainage system or direct discharge to the Baldoyle Bay SAC. Excavations and potentially contaminated stockpiled soils will be constructed/located/sheeted in a manner that ensures water is contained within the site boundary.

If free product is identified during works, this will be pumped, and removed off-site via tanker to a licensed waste disposal facility. The full details of the dewatering works can be found in the Minerex Report accompanying this planning application.

7.6 Secant Pile Construction Methodology

Piles that require rock sockets will be drilled under bentonite or cased to rock head level, to ensure stability of the bore through the water bearing sands. CFA piles will be carefully monitored to ensure positive pressure in the concrete below the auger head as it is retracted, to prevent overbreak or material falling into the bore.

7.7 Night-time light pollution

The external site lighting installation will be designed in line with the following industry standards, best practice guidelines and local authority guidelines:

- Fingal County Council Public Lighting Standards;
- ET101:2008 National Rules for Electrical Installations;
- ET211:2003 Code of Practice for Public Lighting;
- EN 13201 Road Lighting Standards;
- BS 5498:2013 Code of Practice for Design of Road Lighting;
- Luminaires will be selected to ensure that when installed, there shall be zero direct upward light emitted to the sky (all output light shall be at or below 90 ° to the horizontal) to help prevent sky glow from light pollution in the night sky;
- The luminaires shall have a luminous intensity classification of between G4 and G6 to IS EN 13201-2:2003/BS 5489-1:2013 and recommendations of Institute of Lighting Professionals and Bat Conservation Trust ‘Bats and Lighting in the UK’ documentation and Bat Conservation Ireland Guidance Notes for Planners, Engineers, Architects and Developers December 2010;
- The light emitted from light fittings shall have no photo biological risk and shall be categorised as ‘Exempt Group’ in relation to emissions of Blue Light, Infra-red and Ultra Violet Radiation in accordance with EN 62741:2008;
- The luminaires shall have a luminous intensity classification as per the recommendation of IS EN 13201-2:2003, BS 5489-1:2013 and the Institute of Lighting Professionals;
- Guidance for the Reduction of Obtrusive Light GN01:2011, produced by the Institute of Lighting Professionals;
- All luminaires shall comply with IS EN 60598; and
- All luminaires shall be energy efficient LED source fittings with sharp cut off optics.

8 APPRAISAL OF POTENTIAL IMPACTS ON NATURA 2000 SITES

8.1 Linkages to Annex I Habitats

The extent of the four qualifying interest Annex I habitats within Baldoyle Bay SAC is given in the Conservation Objectives document for the site and is included in Appendix 1 of this report. Table 5 below assesses potential linkages of the proposed development to each of the four qualifying interest of Baldoyle Bay SAC.

TABLE 5. IDENTIFICATION OF POTENTIAL FOR IMPACT ON THE ANNEX I HABITATS OF BALDOYLE BAY SAC FROM THE PROPOSED DEVELOPMENT.

Qualifying Interest	Potential for Impact
[1140] **Mudflats and sandflats not covered by seawater at low tide**	This habitat covers the majority of the SAC and extends from the outflow of the Sluice River as far as the west pier at Howth. This habitat is located <20m north of the proposed development site. There is a direct hydrological connection between this habitat and any construction-related surface water discharges from the proposed development via the Bloody Stream and its outflow at the Bob Davis culvert. There is also a potential for impact as a result of any change in the flow rate of the Bloody Stream. The habitat will also experience a degree of overshadowing as a result of the proposed structures. **The potential for impact on this qualifying interest is therefore assessed further in this report.**
[1310] ***Salicornia* and other annuals colonizing mud and sand**	The closest recorded location of *Salcornia* mud [1310] is within Baldoyle Bay, west of Portmarnock Point, *c.*3km to the northwest of the proposed development site. There will be no direct loss of this habitat as a result of the proposed development. There is a significant marine water buffer between the location of any construction related surface water discharges at the proposed development site and the recorded locations of this habitat within Baldoyle Bay SAC. The habitat is located sufficient distance such that there will be no potential for impact from overshadowing or any change in the flow rate of the Bloody Stream. **The potential for impact on this habitat is therefore excluded.**
[1330] **Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)**	The closest recorded location of Atlantic salt meadows [1330] within the SAC is located west of Cush Point, *c.*2.2km to the west of the proposed development site. Other parcels of this habitat are located at Portmarnock Point and at the north of the Bay near the outflow of the Sluice River. There will be no direct loss of this habitat as a result of the proposed development. There is a significant marine water buffer between the location of any construction related surface water discharges at the proposed development site and the recorded locations of this habitat within Baldoyle Bay SAC. The habitat is located sufficient distance such that there will be no potential for impact from overshadowing or any change in the flow rate of the Bloody Stream. **The potential for impact on this habitat is therefore excluded.**

[1410] **Mediterranean Salt Meadows (*Juncetalia maritimi*)**	The recorded locations of this habitat within the SAC are in restricted to the outflow zone of the Mayne River, *c.*4.2km from the proposed development site, and the outflow zone of the Sluice River, *c.*4.6km from the proposed development site. There will be no direct loss of this habitat as a result of the proposed development. There is a significant marine water buffer between the location of any construction related surface water discharges at the proposed development site and the recorded locations of this habitat within Baldoyle Bay SAC. The habitat is located sufficient distance such that there will be no potential for impact from overshadowing or any change in the flow rate of the Bloody Stream. **The potential for impact on this habitat is therefore excluded.**

Two constituent community types of the qualifying interest of *Mudflats and sandflats not covered by seawater at low tide* [1140] have been recorded within Baldoyle Bay SAC:

- Estuarine sandy mud with *Pygospio elegans* and *Tubificoides benedii* community complex; and
- Fine sand dominated by *Angulus tenuis* community complex.

The extent of these two community types within the SAC is given in the Conservation Objectives document for the site and is included in Appendix 1 of this report. The community type “estuarine sandy mud with *Pygospio elegans* and *Tubificoides benedii* community complex” extends from the outflow of the Sluice River as far as Cush Point. The community type “fine sand dominated by *Angulus tenuis* community complex” extends from Cush Point as far as the West Pier in Howth and covers the area of Baldoyle Bay SAC adjacent to the proposed development. A linkage to this habitat type has been identified from various aspects of the proposed development.

The distinguishing species of “fine sand dominated by *Angulus tenuis* community complex” at Baldoyle Bay SAC are as follows: *Angulus tenuis, Angulus fabula, Nephyts cirrosa, Donax vittatus, Scoloplos armiger, Bathyporeia pelagica, Sigalion mathildae,* Enchytraeidae *and Lanice conchilega* (NPWS, 2012b).

ABP Marine Environmental Research Ltd. (hereafter “ABPmer”) have completed a number of reports for the Marine Institute in a series entitled “Tools for Appropriate Assessment of Fishing and Aquaculture Activities in Marine and Coastal Natura 2000 Sites”. Report II of this series covers “Intertidal and Subtidal Sands” and details the sensitivity of habitats to various pressures. The community type of “fine sand dominated by *Angulus tenuis* community complex” found at Baldoyle Bay SAC corresponds to the EUNIS habitat type of “polychaete / amphipod dominated fine sand shores” (A2.23).

Table 6 below assesses potential linkages of the proposed development to each of the qualifying interest of Howth Head SAC.

TABLE 6. IDENTIFICATION OF POTENTIAL FOR IMPACT ON THE ANNEX I HABITATS OF HOWTH HEAD SAC FROM THE PROPOSED DEVELOPMENT.

Qualifying Interest	Potential for Impact
[1230] **Vegetated Sea Cliffs**	As detailed in the Conservation Objectives document for this SAC: "*Cliffs are linear features and are therefore measured in kilometres. The Irish Sea Cliff Survey (Barron et al., 2011) identified the site, though did not survey it, and the length of cliffs within Howth Head SAC is estimated to be 8.22km. The length of cliff is likely to be underestimated*". This habitat is formed on steep or vertical slopes along Howth Head. This habitat is therefore unlikely to be impacted by an increase in visitor numbers at the SAC due to the inaccessibility of the habitat to recreational users. **The potential for impact on this habitat is therefore excluded.**
[4030] **Dry Heath**	As detailed in the Conservation Objectives document for this SAC: "*European dry heath has not been mapped in detail for Howth Head SAC and thus the total area of the qualifying habitat is unknown. Dry heath is the dominant habitat within the SAC and occurs on the slopes above the sea cliffs and in the central part of the peninsula. The habitat occurs in mosaic with other habitats, such dry grassland and exposed rock in places (NPWS internal files)*". The proposed development could potentially result in an increase in visitor numbers within Howth Head SAC, which could negatively impact on this habitat as a result of trampling / erosion. **The potential for impact on this qualifying interest is therefore assessed further in this report.**

An assessment of the potential impacts on this habitat type as a result of the proposed development, based on the criteria outlined in the above document, are included in the relevant sections below.

8.2 Construction Phase

8.2.1 Disturbance to Wintering Birds from Construction-Related Noise

A potential impact on the qualifying interests of seven SPAs (Ireland's Eye SPA, North Bull Island SPA, Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay and River Tolka Estuary SPA, Lambay Island SPA and Rogerstown Estuary SPA) was identified from noise generated during the construction phase of the proposed development which has the potential to cause temporary disturbance to a number of the qualifying interests of the above mentioned seven SPAs, which may utilise *ex-situ* feeding sites within close proximity to the proposed development. The potential noise sources are demolition of the existing structures on site, earth works, construction of basement, Pile foundation, HGV movements and building construction.

As part of the Environmental Impact Assessment Report, Noise Chapter, modelling of potential noise was undertaken. Table 7 below details the model noise at a distance from the site.

TABLE 7. PREDICTED NOISE LEVELS

Distance (m)	Predicted Construction Noise Levels, dB $L_{Aeq,1hr}$				
	Phase A: Site Clearance & Demolition	Phase B Basement excavations	Phase C Piled Foundations	Phase D Piling and Basement Foundation Slab Construction	Phase E Building Construction
25	80	81	73	72	71
30	79	80	71	80	76
70	71	72	64	64	68
500	54	47	55	47	51

At a distance of 500m, the range of noise levels calculated are typical of a sub-urban environment and are not expected to generate any significant noise levels when added to the existing environment at this distance. Baseline noise levels measured along mid portion of the Claremont site set back from road and rail traffic are in the range of 54 – 55dB LAeq. Along the DART line boundary, noise levels are higher, measuring 65 – 68dB LAeq during the daytime. The range of noise levels at this site would also be similar within the Baldoyle area in similar environments.

The conservation objective attributes for each of the qualifying interests of the above seven SPAs are "*Population Trend*" and "*Distribution*". The target for the conservation objective attribute of "*Population Trend*" for each of the relevant qualifying interests is defined as "*long term population trend stable or increasing*". The target for the conservation objective attribute of "*Distribution*" for each of the relevant qualifying interests is defined as "*no significant decrease in the range, timing and intensity of use of areas by* [relevant species]*, other than that* occurring from natural patterns of variation".

The peak count of each of the species recorded at Claremont Strand from 125 individual hourly counts was significantly below the respective 1% national and international population estimate thresholds. While it is possible that acute high-volume noises that may be generated during the temporary construction phase of the proposed development have the potential to disturb flocks of wintering birds at Claremont Strand, any disturbance caused will not adversely impact on the conservation objective attributes of "*Population Trend*" and "*Distribution*" due to the following:

- The insignificant numbers of the birds recording utilising these areas during the winter. The overall average counts of each of the species recorded in relation to the respective national population estimates is 0.14%;
- The short-term (2 years) duration of the construction phase in terms of any resulting noise generated; and
- The measures included as part of the Construction Management Plan in relation to noise control.

Although the above is sufficient to rule out adverse impacts on the relevant SPAs, noise from the proposed development will also be subject to best practice mitigation measures such that it will comply with the limits set out in the noise chapter of the Environmental Impact Assessment Report that accompanies this planning application.

8.2.2 Construction-Related Dust

A potential impact on the qualifying interests of Baldoyle Bay SAC was identified from dust generated during the construction phase of the proposed development which has the potential result in dust deposition impacts.

The conservation objective attributes for each of the qualifying interests of Baldoyle Bay SAC along Claremont Strand are "*Habitat Area*" and "*Community Distribution*".

The target for the conservation objective attribute of "*Habitat Area*" is defined as *"The permanent habitat area is stable or increasing, subject to natural processes"* and *Community Distribution* is *Conserve the following community types in a natural condition: Fine sand dominated by Angulus tenuis community complex; and Estuarine sandy mud with Pygospio elegans and Tubificoides benedii community complex.*

While it is possible that dust may be generated during the temporary construction phase of the proposed development have the potential to impact Claremont Strand, any dust deposition will not adversely impact on the conservation objective attributes of "*Habitat Area*" and "*Com- munity Distribution*" due to the following:

- Minimal amounts of dust reaching Claremont Strand, and the localised nature of the dust deposition;
- The measures included as part of the Dust Minimisation Plan;
- The short-term (2 years) duration of the construction phase in terms of any resulting noise generated; and
- The measures included as part of the Construction Management Plan in relation to dust control.

Although the above is sufficient to rule out adverse impacts on Baldoyle Bay SAC, dust from the proposed development will also be subject to best practice mitigation measures such that it will comply with the limits set out in the air chapter of the Environmental Impact Assessment Report that accompanies this planning application.

8.2.3 Construction-Related Surface Water Discharges

A potential impact on the qualifying interests of Baldoyle Bay SAC was identified as a result of possible discharges of surface waters containing sediment, silt, oils and/or other pollutants into the SAC, which is located <20m from the site boundary, either directly or via the Bloody Stream, during the Construction Phase of the Proposed Development.

It is noted that all surface water collected throughout the Construction Phase of the Proposed Development will be pumped through a treatment system to remove elevated suspended solids and hydrocarbon sheen as set out in the Minerex, 2019 Dewatering Plan. The treated water will be discharged to foul sewer under licence from IW thereby removing any potential

impact on the groundwater and surface water quality as a result of water discharges during the construction of the Proposed Development.

The pressure of "*increased suspended sediment / turbidity*" listed in ABPmer (2013) is analogous to the pressure of construction-related surface water discharges as a result of the pro- posed development. The assessment contained in ABPmer (2013) categorises the Resilience of this habitat to increased sediment as "*very high*" and the Sensitivity as "*not sensitive*". The fauna associated with this habitat type are primarily infaunal and were therefore considered by ABPmer to have a high resistance to increased sediment levels.

In addition, The Construction Environment Management Plan (CEMP) accompanying this application outlines specific measures in relation to the protection of the Bloody Stream during the Construction Phase of the Proposed Development. These are detailed in Section 7 above. It is proposed to re-route the Bloody Stream for the entirety of the Construction Phase. The stream will flow underground in a 750mm diameter pipe until the development is complete in order to eliminate the possibility of contamination of the watercourse, and subsequently Baldoyle Bay SAC, from works associated with the Construction Phase of the Proposed Development. As an additional protection against plant/activity, the pipes will be encased in 150mm of concrete, in accordance with Fingal County Council Guidelines and the Greater Dublin Regional Code of Practice for Drainage Works.

These mitigation measures safeguard the Bloody Stream and Claremont Strand from the potential of water containing oils and other pollutants reaching Baldoyle Bay SAC.

It is therefore considered that there will be no adverse effects on the constituent community type of "fine sand dominated by *Angulus tenuis* community complex" of Baldoyle Bay SAC in respect of the conservation objective attributes of "*habitat area*" and "*community distribution*" as a result of construction-related surface water discharges from the proposed development.

8.2.4 Construction-related Ground water Discharges

A potential impact on the qualifying interests of Baldoyle Bay SAC was identified as a result of possible discharges of ground water containing sediment, silt, oils and/or other pollutants into the SAC, which is located <20m from the site boundary via ground water tidal influence, during the Construction Phase of the Proposed Development.

The proposed dewatering works and secant pile methodology will mitigate the potential for groundwater contamination as a result of excavation, which can be described as a low to likely probability and mild consequence resulting in a Low to Low/Moderate risk. A detailed risk to ground water assessment has been complete as part of this planning application and can be found in Golder 2019 *Interpretative Ground Investigation Report* accompanying this planning application. The bulk of excavation of contaminated soils will be carried out before dewatering. Made ground where majority of contaminants identified is above the water table

Robust dewatering methodologies in accordance with the MMRP (Golder, 2019c), the OCEMP (Enviroguide, 2019a), the CMP (BMCE, 2019a) and the CDWMP (BCME, 2019d), the Dewatering Plan (Minerex, 2019), best practice standards (i.e. CIRIA – C750) and regulatory consents to minimise the potential impact on the local groundwater flow regime and associated receptors, namely the Baldoyle Bay SAC water regime.

Groundwater in the excavation will be controlled based on the methodology outlined in the

Dewatering Design (Minerex, 2019). The treatment system will be installed on-site for the duration of the project to meet the requirements of the discharge licence but will typically include a number of stages of settlement and filtration to remove sludge, suspended solids, free-phase hydrocarbons (oils) and dissolved phase hydrocarbons to ensure the conditions of the temporary discharge consent are met.

There will be no direct discharge of groundwater from the site to groundwater or surface water. The groundwater removed will be discharged into the public sewer in accordance with the necessary consent/licence issued under Section 16 of the Local Government (Water Pollution) Acts and Regulations and must be obtained from IW. Any such discharge licence is likely to be subject to conditions regarding the flow (rates of discharge, quantity etc.); effluent quality prior to discharge and pre-treatment (e.g. settlement/filtration, hydrocarbon separation etc.) and monitoring requirements. All dewatering will be undertaken in strict compliance with the conditions of the discharge licence for the construction phase of the Proposed Development.

A monitoring programme will be implemented to ensure that water quality criteria set out in the discharge licence are achieved prior to discharging to the sewer. It is therefore deemed that there will be no adverse effects on the constituent community type of “fine sand dominated by *Angulus tenuis* community complex” of Baldoyle Bay SAC in respect of the conservation objective attributes of “*habitat area*” and “*community distribution*” as a result of construction-related surface water discharges from the proposed development

8.3 Operational Phase

8.3.1 Increased Human Presence

8.3.1.1 Disturbance to Wintering Birds

A potential impact on the qualifying interests of seven SPAs (Ireland's Eye SPA, North Bull Island SPA, Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay and River Tolka Estuary SPA, Lambay Island SPA and Rogerstown Estuary SPA) was identified from increased human presence at Claremont Beach during the operational phase of the proposed development which has the potential to cause disturbance to qualifying interests of the above SPAs, should they regularly utilise this section of coastal habitat.

The stretch of coastal areas west of Claremont Strand, i.e. encompassing *Burrow Strand* and the *Hole in the Wall* beach, also have the potential to experience increased human presence as a result of the proposed development. These areas have been designated for the same habitat as Claremont Strand; "fine sand dominated by *Angulus tenuis* community complex" (NPWS, 2012b).

These areas likely to support similar bird species assemblage as Claremont Strand. As shown in results section, numbers of waterbirds are highest at low tide when the area of exposed sandflats is highest. There is currently no restriction on the usage of Claremont Strand, Hole in the Wall beach and Burrow Beach by recreational users and dogs.

The peak count of each of the species recorded at Claremont Strand from 125 individual hourly counts was significantly below the respective 1% national and international population estimate thresholds. While it is possible that increased human presences that may be generated during operational phase of the proposed development have the potential to disturb flocks of wintering birds at Claremont Strand, any disturbance caused will not adversely impact on the conservation objective attributes of "*Population Trend*" and "*Distribution*" due to the following:

- The insignificant numbers of the birds recording utilising these areas during the winter. The overall average counts of each of the species recorded in relation to the respective national population estimates is 0.14%;
- The existing nature of the Claremont Strand will not change to the extent that it will have an adverse impact on the conservation objectives of any SPA due to the proposed development. The strand is used regularly by walkers, dogs and other recreational users.

8.3.1.2 Fine sand dominated by Angulus tenuis community complex

The proposed development is located adjacent to the Annex I habitat "mudflats and sandflats not covered by seawater at low tide" [1140] at Claremont Beach. The constituent community type in this area is "fine sand dominated by *Angulus tenuis* community complex". A potential for impact on this habitat type was identified arising from the increased human presence and associated usage of Claremont Beach as a result of the proposed development.

The pressure of "*trampling – access by foot*" listed in ABPmer (2013) is analogous to the pressure increased human presence at Claremont Beach as a result of the proposed development. The assessment contained in ABPmer (2013) categorises the Resilience of this habitat to trampling by foot as "*very high*" and the Sensitivity as "*not sensitive*". The species that occur within sand habitats are adapted to sediment disturbance and therefore the recovery of this habitat from trampling was classified as high-very high.

It is therefore considered that the potential increased human presence at Claremont beach, Hole-in-the-wall beach and Burrow beach will not adversely affect the constituent community type of "fine sand dominated by *Angulus tenuis* community complex" present in this area in respect of the conservation objective attributes of "*habitat area*" and "*community distribution*".

8.3.1.3 Howth Head SAC

A potential impact on the qualifying interests of Howth Head SAC was identified as a result of a possible increase in footfall and visitor numbers within the SAC, and the potential resulting habitat loss/alteration/erosion, as a result of the increase in local population numbers during the operational phase of the proposed development.

The SAC contains a number of popular walking trails, namely the Cliff Path Loop. Erosion caused as a result of walking and horse-riding activities is highlighted in the Site Synopsis for this SAC (NPWS, 2013e). The proposed development will result in an increase of a potential *c*.1,075 inhabitants in the local area.

Walking routes along Cliff Path Loop are already managed for disturbance, for example there are fencing and barriers in place to protect habitats. Increased usage as a result of the pro- posed development will not result in a significant increase with the capacity to result in adverse impact to habitats in relation to conservation objective of Howth Head SAC. This is due to the mitigation measure already in place along the Cliff Path Looped walk.

8.3.2 Disturbance to Flight-lines from Presence of Proposed Structures

A potential impact on the qualifying interests of seven SPAs (Ireland's Eye SPA, North Bull Island SPA, Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay and River Tolka Estuary SPA, Lambay Island SPA and Rogerstown Estuary SPA) was identified from the operation of the proposed development, which has the potential to impact on the flight lines of qualifying interests commuting to/from roost/feeding sites as a result of the presence of the proposed structures.

The conservation objective attributes for each of the qualifying interests of the above seven SPAs are "*Population Trend*" and "*Distribution*". The target for the conservation objective at- tribute of "*Population Trend*" for each of the relevant qualifying interests is defined as "*long term population trend stable or increasing*". The target for the conservation objective attribute of "*Distribution*" for each of the relevant qualifying interests is defined as "*no significant de- crease in the range, timing and intensity of use of areas by* [relevant species]*, other than that occurring from natural patterns of variation*".

Following the assessment of further information, it is determined that the presence of the structures associated with the proposed development will not adversely impact on the conservation objective attributes of "*Population Trend*" and "*Distribution*" of relevant qualifying interests. This determination is based on the following:

- The infrequency of occurrence of 'at-risk' species recorded in-flight over the proposed development site;
- The insignificant numbers of individual birds of at-risk' species recorded in-flight over the proposed development site; and
- The average recorded flight heights of 'at-risk' species recorded in-flight over the pro- posed development site in relation to the projected maximum height of the proposed development structures.

8.3.3 Overshadowing

The proposed development is located adjacent to the Annex I habitat "mudflats and sandflats not covered by seawater at low tide" [1140] at Claremont Beach. The constituent community type in this area is "fine sand dominated by *Angulus tenuis* community complex". The presence of the structures associated with the proposed development will result in a degree of over- shadowing at Claremont Beach and a potential for impact was identified on this habitat.

The pressure of "*prevention of light reaching seabed/features*" listed in ABPmer (2013) is analogous to the pressure of overshadowing reducing light at Claremont Beach as a result of the proposed development. The assessment contained in ABPmer (2013) categorises the resilience of this habitat to reductions in light as "*very high*" and the Sensitivity as "*not sensitive*". The distinguishing species of this habitat do not photosynthesise and are therefore not considered to be sensitive to the effects of shading. While a potential reduction in microphytobenthos could result in decreases in sediment stability, the waterlogged fine sands of this habitat should remain relatively cohesive regardless. In addition the overshadowing effect associated with the structures of the proposed development during the operational phase will be of varying extent and limited duration; dependent on time of day and year.

It is therefore considered that the presence of the structures associated with the proposed development and the resulting overshadowing at Claremont beach will not adversely affect the constituent community type of "fine sand dominated by *Angulus tenuis* community complex" present in this area in respect of the conservation objective attributes of "*habitat area*" and "*community distribution*".

8.3.4 Light spill

Similarly, to overshowing during the day, light spill from the development at night-time, has the potentially to cause disturbance to the qualifying interest of the SACs and SPAs in the area.

While it is considered that the presence of additional light sources in the area will increase, it will not adversely affect the constituent community type of "fine sand dominated by *Angulus tenuis* community complex" present in this area in respect of the conservation objective attributes of "*habitat area*" and "*community distribution*".

The conservation objective attributes for each of the qualifying interests of the above seven SPAs are "*Population Trend*" and "*Distribution*". The target for the conservation objective at- tribute of "*Population Trend*" for each of the relevant qualifying interests is defined as "*long term population trend stable or increasing*". The target for the conservation objective attribute of "*Distribution*" for each of the relevant qualifying interests is defined as "*no*

significant de- crease in the range, timing and intensity of use of areas by [relevant species]*, other than that* occurring from natural patterns of variation".

The peak count of each of the species recorded at Claremont Strand from 125 individual hourly counts was significantly below the respective 1% national and international population estimate thresholds. While it is possible that additional night-time light may cause indirect disturbance during the operation of the proposed development, with the potential to disturb flocks of wintering birds at Claremont Strand and beyond into Baldoyle Bay, any disturbance caused will not adversely impact on the conservation objective attributes of "*Population Trend*" and "*Distribution*" due to the following:

- All luminaires having sharp cut off optic's, limiting intense light travelling far distances;
- The light emitted from light fittings shall have no photo biological risk and shall be categorised as 'Exempt Group' in relation to emissions of Blue Light, Infrared and Ultra- violet Radiation in accordance with EN 62741:2008;
- Luminaires will be selected to ensure that when installed, there shall be zero direct upward light emitted to the sky (all output light shall be at or below 90 ° to the horizontal) to help prevent sky glow from light pollution in the night sky; and
- The luminaires shall have a luminous intensity classification of between G4 and G6 to IS EN 13201-2:2003/BS 5489-1:2013.

8.3.5 Flooding Events and Surface Water Drainage

The proposed development and surrounding area are located within Flood Zone C, i.e. the lowest risk zone where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).

A Site-Specific Flood Risk Assessment has been undertaken for the proposed development by Barrett Mahoney (Document No: 18.386 – FR-01) for this planning application. The reports details that the proposed development includes the introduction of a surface level watercourse through the site. The proposed development has been designed to mitigate flood risk that the new watercourse may introduce to the site, such as:

- Setting residential accommodation is set at 6.4m OD
- All openings are set at 4.5m OD or above - (figure based on 0.1% AEP HEFS)
- Water grill positioned at the end of the open channel to stop large debris entering the underground system.
- Backup drain provided in the event the open channel is fully blocked, providing alternative means of escape.

In an extreme flood, there could potentially be a sea breach, due to the nature of the site. However, this is extremely unlikely due to the site levels, the current sea protection in place and the proposed boundary wall to the North of the development is set at 4.5m OD and all openings limited to 4.5m OD.

The Surface Water drainage for the Operational Phase is described in detail in section 7.5 and is deemed that it will not to have any impacts on Natura 2000 sites.

8.3.6 Groundwater Linkages

During the operation and post the secant piled wall ensuring the basement is watertight, no impact or groundwater linkages is expected post construction and during operation of the pro- posed development.

8.3.7 Alterations to Flow Rate at Bloody Stream Outflow

The proposed development is located adjacent to the Annex I habitat "mudflats and sandflats not covered by seawater at low tide" [1140] within Baldoyle Bay cSAC. The constituent com- munity type in this area is "fine sand dominated by *Angulus tenuis* community complex". The Bloody Stream currently outflows into this habitat via the Bob Davis culvert *c.*20m north of the proposed development site. As part of the works proposed to the culverted section of the Bloody Stream, the flow rate at the outflow point onto Claremont Beach will be increased in comparison to its current state. This is due to the removal of a number of structures currently present within the culvert, in addition to changes in the slope of the culvert in the section immediately prior to the outflow point.

The pressure of "*changes to water flow*" listed in ABPmer (2013) is analogous to the pressure of an increased flow rate at the outflow of the Bloody Stream as a result of the proposed development. It is proposed, during the Operational Phase of the Proposed Development the flow rate of the Bloody Stream will go from 40.7 l/s to 5.5 l/s in a 1-year return period and from
123.11 l/s to 64.80 l/s in a 100-year return period. The proposed flows generated from the site alone are significantly reduced but these are a small part of the proposed surface water flows for the Bloody Stream.

Using the pressure approach and the sensitive habitat type, with the change to the flow rate being localised in nature, it is deemed not to have an adverse impact the community type of "fine sand dominated by *Angulus tenuis* community complex" present in this area in respect of the conservation objective attributes of "*habitat area*" and "*community distribution*". This is due to the small decrease of water flow and due to the fact that the Bloody Stream outfall is there at present with varied flowrates. There will be limited impact to the flow rates that are already experienced on a yearly cycle at present.

8.4 Cumulative Impacts

The following permitted, or in-progress, developments within the vicinity of the proposed development were reviewed and considered for possible cumulative impacts with the proposed development:

SHD/001/18 (*Crekav Trading GP Limited*) - Planning application for proposed strategic housing development comprising 163 no. residential units at the former Baily Court Hotel, Main Street and at lands located south of the Martello tower on Balscadden Road, Howth County Dublin all on a site measuring *c.*1.55ha.

The permitted SHD at Balscadden, Howth, Co. Dublin has the potential to act cumulatively with the proposed development in relation to the following impacts identified above:

- Increased human presence at Claremont Beach during the operational phase of the proposed development, which has the potential to cause disturbance to

qualifying interests of seven SPAs within the precautionary zone of influence of the proposed development, should they regularly utilise this section of coastal habitat.

- Possible increased footfall and visitor numbers within Howth Head SAC, and the potential resulting habitat loss/alteration/erosion, as a result of the increase in local population numbers because of the proposed development.

The above SHD (SHD/001/18) will result in an increase of a potential *c*.342 inhabitants in the local area. This increase in population, in conjunction with the potential of *c.* 1,075 inhabitants from the proposed development, could act cumulatively in relation to the potential impacts outlined above.

F18A/0267 (*Dept. of Agriculture, Food & Marine*) - Construction of two number ground level industrial buildings (5 number units each) and associated site works at Claremont, West Pier, Howth, Co. Dublin.

The above development has the potential to act in-combination with the proposed development in relation to the following identified impacts:

Environmental nuisances (noise, dust and vibrations) generated during the construction phase of the proposed development which have the potential to cause disturbance to qualifying interests of seven SPAs within the precautionary zone of influence of the proposed development, should they regularly utilise this section of coastal habitat in close proximity to the pro- posed development.

The potential for this to have a cumulative effect would only arise should the Construction Phase of the Proposed Development occur simultaneously with the construction of the above permitted development.

F17A/0553 (*Oceanpath Ltd.*) - The construction of 1,258 sq.m.(approx.) two storey extension (8.135 metres high approx.) to west side of existing 1,130 sq.m. (approx.) two storey building (8,135 metres high approx.) at Sites 37-03 and 37-05, Claremont Industrial Estate, West Pier, Howth, Co Dublin.

The construction of the above permitted development has already been completed. It is considered that there is no potential for the proposed development to act cumulatively with the above development, and therefore no potential for likely significant effects on Natura 2000 sites as a result of cumulatively effects.

F18/0074 Permission granted for the provision of 130m long quay wall; associated deck area, road access, hard standing; localised dredging to facilitate works, dredging to -4m Chart Datum along the front of new quay wall to provide berthing depth and land reclamation of approximate 0.30 Ha on the east side of Middle Pier of Howth FHC.

Granted Permission on 01/10/2019. The above permitted development has the potential to impact on the Natura 2000 sites by creating environmental nuisances or releasing contaminants into the marine environment during the construction phase.

Once the mitigation measures set out in the Grant of Permission F18/0074 dated 10th July 2018, and **in particular** those detailed in the Conditions listed below, are complied with it is deemed that that the cumulative effect of this permission and the proposed development will not have an adverse impact on any European site:

1. Mitigation Measures set out in Section 8 of the Natura Impact Statement received as Significant Additional Information shall be undertaken in full.
   Reason: To ensure protection of Natura 2000 site and associated qualifying interests.
2. Mitigation Measures set out in Section 5.4 of the Marine Mammal Risk Assessment shall be undertaken in full.
   Reason: To ensure protection of Natura 2000 site and associated qualifying interests.
3. The Environmental Management Plan, which shall contain the following documents, shall be submitted for agreement of the Planning Authority prior to the commencement of development:
   a) An excavation and spoil management plan;
   b) Surface water management plan;
   c) Waste management plan;
   d) Fuel and oil management plan;
   e) Procedures and contingency plans to deal with emergency accidents and spills;
   f) Name and contact details of a community liaison for the project.

   Reason: To ensure adequate protection of the aquatic environment.

8.5 Appraisal of impacts to Natura 2000 sites

8.5.1 Increased number accessing Howth Head SAC

As detailed above a potential impact on the qualifying interests of Howth Head SAC was identified as a result of a possible increase in footfall and visitor numbers within the SAC, and the potential resulting habitat loss/alteration/erosion, as a result of the increase in local population numbers during the Operational Phase of the Proposed Development.

The SAC contains a number of popular walking trails, namely the Cliff Path Loop. Erosion caused as a result of walking and horse-riding activities is highlighted in the Site Synopsis for this SAC (NPWS, 2013e). The proposed development will result in an increase of population in the local area.

Walking routes along Cliff Path Loop are already managed for disturbance, for example there is fencing and barriers in place to project habitats. Increased usage as a result of the proposed development will not result in a significant increase with the capacity to result in adverse impact to habitats in relation to conservation objective of Howth Head SAC. This is mainly due to the mitigation measure already in place along the Cliff Path Looped walk.

8.5.2 Disturbance to Claremont Strand and beyond due to increased human activity

The peak count of each of the species recorded at Claremont Strand from 125 individual hourly counts was significantly below the respective 1% national and international population estimate thresholds. While it is possible that acute high-volume noises that may be generated during the temporary Construction Phase of the Proposed Development have the potential to disturb flocks of wintering birds at Claremont Strand, any disturbance caused

will not adversely impact on the conservation objective attributes of "*Population Trend*" and "*Distribution*" due to the following:

- The insignificant numbers of the birds recording utilising these areas during the winter. The overall average counts of each of the species recorded in relation to the respective national population estimates is 0.14%;
- The short-term (2 years) duration of the construction phase in terms of any resulting noise generated; and
- The measures included as part of the Construction Management Plan in relation to noise control.

Site specific survey data was gathered in the 2018/2019 winter season, other data from IWeBS and Conservation Objectives data was also used in the assessment. Previous planning application on this site, such as F15A/0362 did not include wintering bird survey data and were accompanied with an AA Screenings and no NIS. The bird survey demonstrated that small numbers of birds were involved and as such the survey data could be relied upon for this NIS.

It is considered that there are no other means for the proposed development to act in-combi- nation with any other plan or project in relation to any likely significant effects on any Natura 2000 sites.

8.5.3 In-Combination Effects on Water Quality and/or Resource

This section addresses the general issue of potential cumulative impacts with Ringsend Wastewater Treatment Plant arising from the Operational Phase of the Proposed Development and other developments, including future developments.

In summary, the impact of the Proposed Development and any future development has already been appropriately considered and assessed as part of the application process for the existing planning permissions pertaining to Ringsend Wastewater Treatment Plant.

The 2012 Ringsend Wastewater Treatment Plant application for planning permission (Ref. PL.29N.YA0010) was for a population equivalent of 2.4 million and was predicated on the findings of the 2005 Greater Dublin Strategic Drainage Study (**GDSDS**). The GDSDS set out the drainage requirements for the Greater Dublin Area (**GDA**) up to 2031. The GDSDS relied on the Regional Planning Guidelines (**RPGs**) and the National Spatial Strategy (**NSS**) in order to estimate the future projected population increases for the GDA. The studies indicated a predicted growth in population from 1.2 million in 2002 to just over 2 million in 2031 for the GDA region.

Therefore, both the initially permitted 2012 upgrade and the permitted 2019 revised upgrade (Ref. ABP-301798-18) for Ringsend Wastewater Treatment Plant take account of population growth up to 2.4 million population equivalents. Both applications were subject to EIA and therefore accompanied by an EIAR. Additionally, both applications were accompanied by an AA screening report and a NIS (though it appears that only parts of the 2012 application were screened out for AA).

Notwithstanding the above, on an individual basis, the Operational Phase of the Proposed Development will have an imperceptible effect on the habitats/species/qualifying interests

listed within the relevant European sites specifically South Dublin Bay and River Tolka Estuary SPA (site code 004024), South Dublin Bay SAC (000210), North Bull Island SPA (004006), North Dublin Bay SAC (000206), Howth Head Coast SPA (004113), Dalkey Islands SPA (004172), Rockabill to Dalkey Island SAC (003000) in terms of flows, relative to the total amount of waste water currently being received at Ringsend Wastewater Treatment Plant.

In addition, Irish Water has provided a Confirmation of Feasibility Letter and Statement of Design Acceptance for the foul sewer design of the Proposed Development (see Appendix IV). Irish Water is in control of this infrastructure and the purpose of the Confirmation of Feasibility Letter and Statement of Design Acceptance is to confirm the viability of the Proposed Development with respect to its potential impact on the capacity of Ringsend Wastewater Treatment Plant, as the receiving infrastructure.

By providing a Confirmation of Feasibility Letter and Statement of Design Acceptance, Irish Water has confirmed that, based on current projected infrastructure, the Proposed Development can be accommodated within the drainage network.

Under the heading of *"Potential impact – Discharge of treated effluent, impacts on water quality, effects on qualifying interests"*, the NIS for the Ringsend Wastewater Treatment Plant 2019 revised upgrade provides as follows:

"In the operational phase, the proposed upgrade of the Ringsend WwTP Component will result in an increase in the plant capacity and also an improvement in the final effluent quality. This will result in a reduction in the licensed parameters discharged into the receiving water, with significantly reduced quantities in respect of ammonia and phosphorous."[1]

This NIS goes on to state as follows:

"Overall no significant adverse effects on are foreseen and indeed, a slight positive effect is possible. Effects of discharge during the operational phase of the project from the upgrade project will therefore have imperceptible impact on habitats listed within these European sites."[2]

In respect of this issue, the NIS concludes as follows:

"Thus, there is no potential for in-combination impacts of any other plan and project with the Ringsend WwTP Component of the proposed Upgrade Project."[3]

Therefore, given the above determination and given that any water entering Dublin Bay as a result of the Proposed Development at Claremont via the WWTP will become rapidly mixed and diluted to such a low level that it becomes indistinguishable from the rest of the bay water (O'Higgins and Wilson, 2005, Wilson and Jackson 2011, Scott Cawley 2017), it can be concluded on the basis of objective information with certainty that the in-combination

[1] Section 4.5.1 at page 32

[2] Section 4.5.1 at page 33

[3] Section 4.5.1 at page 34

effects of the Ringsend WWTP and the Proposed Development will not have an effect on any Natura 2000 site, individually or together with other plans and projects.

On 13th November 2019 An Bord Pleanala granted permission for Irish Water's Greater Dublin Drainage Scheme in Clonshaugh in North Dublin. (Reference PL06F.301908). This project when complete will provide an additional 500,000 PE (Population Equivalent) wastewater treatment to the Greater Dublin Area and will further reduce the potential for impact on Natura 2000 sites.

9 CONCLUSION

This Natura Impact Statement details the findings of the Stage 2 Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the proposed development planning application at Claremont, Howth on the following Natura 2000 sites:

- Baldoyle Bay SAC [000199]
- Howth Head SAC [000202]
- Ireland's Eye SPA [004117]
- North Bull Island SPA [004006]
- Baldoyle Bay SPA [004016]
- Malahide Estuary SPA [004025]
- Lambay Island SPA [004069]
- South Dublin Bay and River Tolka Estuary SPA [004024]
- Rogerstown Estuary SPA [004015]

The above sites were identified by a screening exercise that assessed likely significant effects of a range of effects that may arise from the proposed development. The Appropriate Assessment investigated the potential direct and indirect impacts of the proposed works, both during construction and operation on the integrity and qualifying interests of the above Natura 2000 sites, alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives.

Where potentially significant adverse impacts were identified, a range of mitigation and avoidance measures have been suggested to help offset them. As a result of this Appropriate Assessment it has been concluded that, ensuring the avoidance and mitigation measures are implemented as proposed, the proposed development at Claremont, Howth will not have a significant adverse impact on the above Natura 2000 sites.

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Appendix I - Natura 2000 Site NPWS Conservation Objective Documents

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National Parks and Wildlife Service

Conservation Objectives Series

Baldoyle Bay SAC 000199

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

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

7 Ely Place, Dublin 2, Ireland.

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Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

000199	Baldoyle Bay SAC
1140	Mudflats and sandflats not covered by seawater at low tide
1310	Salicornia and other annuals colonizing mud and sand
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1410	Mediterranean salt meadows (*Juncetalia maritimi*)

Please note that this SAC overlaps with Baldoyle Bay SPA (004016). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping SPA as appropriate.

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

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

Title: Intertidal Benthic Survey Baldoyle Bay SAC and Baldoyle Bay SPA
Year: 2012
Author: MERC; ERM
Series: Unpublished Report to NPWS & MI

Title: Baldoyle Bay SAC (000199). Conservation objectives supporting document - marine habitats [Version 1]
Year: 2012
Author: NPWS
Series: Unpublished Report to NPWS

Title: Baldoyle Bay SAC (000199). Conservation objectives supporting document - coastal habitats [Version 1]
Year: 2012
Author: NPWS
Series: Unpublished Report to NPWS

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

Title: Coastal Monitoring Project 2004-2006
Year: 2009
Author: Ryle, T.; Murray, A.; Connolly, C.; Swann, M.
Series: Unpublished Report to NPWS

Title: A Survey of Intertidal Mudflats and Sandflats in Ireland
Year: 2007
Author: Aquatic Services Unit
Series: Unpublished Report

Title: Saltmarsh Monitoring Report 2006
Year: 2007
Author: McCorry, M.
Series: Unpublished Report to NPWS

Spatial data sources

Year:	Interpolated 2012
Title:	Intertidal surveys 2007, 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used for:	Marine community types, 1140 (maps 3 and 4)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used for:	Marine community types base data (map 4)
Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary; overlapping regions with Coastal CO data investigated and resolved with expert opinion used
Used for:	1310, 1330, 1410 (map 5)

1140 Mudflats and sandflats not covered by seawater at low tide

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

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated as 409ha using OSi data
Community distribution	Hectares	Conserve the following community types in a natural condition: Fine sand dominated by *Angulus tenuis* community complex; and Estuarine sandy mud with *Pygospio elegans* and T*ubificoides benedii* community complex. See map 4	Habitat structure was elucidated from intertidal surveys undertaken in 2007 (Aquafact, 2007) and 2010 (MERC and ERM, 2012). See marine habitats supporting document for further information

1310 Salicornia and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 0.383ha. See map 5	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry, 2007). Habitat recorded at one sub-sites surveyed and mapped, giving a total estimated area of 0.38ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 5 for known distribution	Based on data from McCorry (2007). This habitat was more extensive in the past. *Salicornia* is an annual species, so its distribution can vary significantly from year to year. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry (2007). Sediment supply is particularly important for this pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. At Baldoyle there are some signs of erosion of the saltmarsh in the mid part and south-eastern corner of the estuary. Accretion has occurred at the lower end of Portmarnock spit. See coastal habitats backing document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry (2007). Creeks deliver sediment throughout saltmarsh system. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on date from McCorry (2007). This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry (2007). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry (2007). Saltmarshes at Baldoyle are not grazed by livestock and have a diverse sward structure. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry (2007). See coastal habitats supporting document for further details

1310 Salicornia and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry (2007). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species-*Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry (2007). Spartina swards occur extensively throughout the Baldoyle sub-site. Additional clumps of cordgrass are present within the *Salicornia* flats, although at low cover values. See coastal habitats supporting document for further details

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

To maintain the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 11.98ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007). One sub-site supporting Atlantic salt meadow was mapped giving a total estimated area of 11.98ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 5 for known distribution	Based on data from McCorry (2007). No indications of any loss in extent of ASM at Baldoyle. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry (2007). There are some small areas of erosion in places and these may have been exacerbated by infilling and sea defence measures (sea wall). See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	Based on data from McCorry (2007). The largest area of ASM at Baldoyle has a well developed creek and pan structure. The other parts have a poorly developed structure. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry (2007). At Baldoyle there are transitions to sanddune habitats as well as transitional mosaics within the saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry (2007). The saltmarshes around Baldoyle are not grazed by livestock allowing a diverse sward structure to develop. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the area outside of the creeks vegetated	See coastal habitats supporting document for further details

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

To maintain the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry (2007). Species of local distictiveness at Baldoyle include the Red Data Book species, Borrer's saltmarsh-grass (*Puccinellia fasciculata*) and meadow barley (*Hordeum secalinum*). The locally rare species rock lavender (*Limonium binervosum*) was also recorded at Baldoyle. See coastal habitats supporting document for further details
Vegetation structure: negative indicator species-*Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry (2007). *Spartina* occurs extensively at Baldoyle bay. See coastal habitats supporting document for further details

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

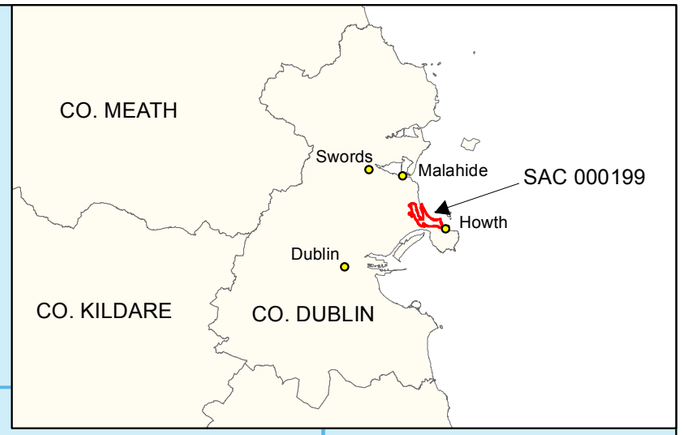
To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 2.64ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007). One sub-site that supports Mediterranean Salt Meadow was mapped, giving a total estimated area of 2.64ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry (2007). There are some indications that the area of brackish marsh at Mayne including the MSM community has decreased. Older maps show that the brackish vegetation was more extensive in the recent past. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007). The MSM at Baldoyle has a poorly developed topography. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadow is found high up in the saltmarsh but requires occasional tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry (2007). At Baldoyle there are transitions to sand dune habitats as well as transitional mosaics within the saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within the sward	Based on data from McCorry (2007). The saltmarshes around Baldoyle are not grazed by livestock allowing a diverse sward structure to develop. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the area outside of the creeks vegetated	Based on data from McCorry (2007). See coastal habitats supporting document for further details

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Baldoyle Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species	Percentage cover	Maintain range of sub-communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry (2007). Species of local distictiveness at Baldoyle include the Red Data Book species, Borrer's saltmarsh-grass (*Puccinellia fasciculata*) and meadow barley (*Hordeum secalinum*). The locally rare species rock lavender (*Limonium binervosum*) was also recorded at Baldoyle. See coastal habitats supporting document for further details
Vegetation structure: negative indicator species-*Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%	Based on data from McCorry (2007). *Spartina* occurs extensively at Baldoyle bay. See coastal habitats supporting document for further details



Legend

SAC 000199

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Department of Arts, Heritage and the Gaeltacht

MAP 1:
BALDOYLE BAY SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

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

SITE CODE:
SAC 000199 CO. DUBLIN; version 1.2

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: October 2012

Legend

- Baldoyle Bay SAC 000199
- Baldoyle Bay SPA 004016

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MAP 2:
BALDOYLE BAY SAC
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING
DESIGNATIONS

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

SITE CODE:
SAC 000199 CO. DUBLIN; version 1.2

0 0.2 0.4 0.6 0.8 1 km

N

Map Version 1
Date: October 2012

Legend

- SAC 000199
- 1140 Mudflats and sandflats not covered by seawater at low tide
- OSi Discovery Series County Boundaries

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MAP 3:
BALDOYLE BAY SAC
CONSERVATION OBJECTIVES
TIDAL MUDFLATS AND SANDFLATS

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

SITE CODE:
SAC 000199 CO. DUBLIN; version 1.2

0 0.2 0.4 0.6 0.8 1 km

N

Map Version 1
Date: October 2012

Legend

SAC 000199

OSi Discovery Series County Boundaries

Marine Community Types

Estuarine sandy mud with *Pygospio elegans* and *Tubificoides benedii* community complex

Fine sand dominated by *Angulus tenuis* community complex

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MAP 4:
BALDOYLE BAY SAC
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

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

SITE CODE:
SAC 000199 CO. DUBLIN; version 1.2

0 0.2 0.4 0.6 0.8 1 km

N

Map Version 1
Date: October 2012

Legend

SAC 000199

OSi Discovery Series County Boundaries

SMP 0003 Saltmarsh Monitoring Project Site Codes

Qualifying Interests

1310 *Salicornia* and other annuals colonising mud and sand

1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

1330 / 1410 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) / Mediterranean salt meadows (Juncetalia maritimi)

1410 Mediterranean salt meadows (Juncetalia maritimi)

SMP 0003

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MAP 5:
BALDOYLE BAY SAC
CONSERVATION OBJECTIVES
SALTMARSH HABITATS

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

SITE CODE:
SAC 000199 CO. DUBLIN; version 1.2

0 0.2 0.4 0.6 0.8 1 km

N

Map Version 1
Date: October 2012

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Howth Head SAC 000202

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

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Series Editor: Rebecca Jeffrey
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Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

000202	Howth Head SAC
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts
4030	European dry heaths

Please note that this SAC overlaps with North Bull Island SPA (004006) and Howth Head Coast SPA (004113) and adjoins North Dublin Bay SAC (000206) and Rockabill to Dalkey Island SAC (003000). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2011
Title :	National survey and assessment of the conservation status of Irish sea cliffs
Author :	Barron, S.J.; Delaney, A.; Perrin, P.M.; Martin, J.; O'Neill, F.
Series :	Irish Wildlife Manual No. 53
Year :	2012
Title :	Ireland Red List no. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Howth Head SAC (site code: 202) Conservation objectives supporting document- coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1988
Title :	The Irish red data book 1. Vascular plants
Author :	Curtis, T.G.F.; McGough, H.N.
Series :	Wildlife Service, Dublin
Year :	2002
Title :	A Catalogue of Alien Plants in Ireland
Author :	Reynolds, S.C.P.
Series :	National Botanic Gardens, Glasnevin
Year :	2005
Title :	National inventory of sea cliffs and coastal heaths
Author :	Browne, A.
Series :	Unpublished Report to NPWS

Spatial data sources

Year :	2011
Title :	National survey and assessment of the conservation status of Irish sea cliffs
GIS Operations :	Clipped to SAC boundary
Used For :	1230 (map 3)

Conservation Objectives for : Howth Head SAC [000202]

1230 Vegetated sea cliffs of the Atlantic and Baltic coasts

To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Howth Head SAC, which is defined by the following list of attributes and targets:

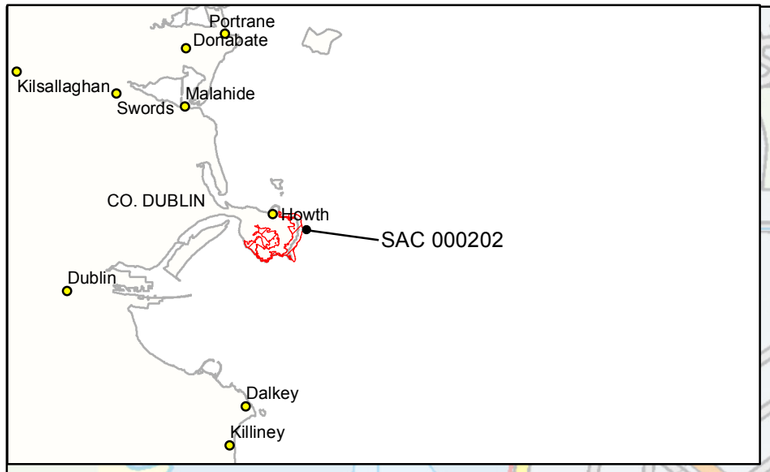
Attribute	Measure	Target	Notes
Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. Total length of cliff: 8.22km. See map 3	Cliffs are linear features and are therefore measured in kilometres. The Irish Sea Cliff Survey (Barron et al., 2011) identified the site, though did not survey it, and the length of cliffs within Howth Head SAC is estimated to be 8.22km. The length of cliff is likely to be underestimated. See the Howth Head SAC conservation objectives supporting document for coastal habitats for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3	See map 3 for the estimated distribution of sea cliffs in the SAC. Hard cliffs have been noted in this SAC and it is thought that all of the cliffs are of the hard type (Browne, 2005). See the coastal habitats supporting document for further details
Physical structure: functionality and hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures	Attribute and target based on Barron et al. (2011). Maintaining natural geomorphological processes, including natural erosion, is important for the health of vegetated sea cliffs. Hydrological processes maintain flushes, and in some cases tufa formations, that can be associated with sea cliffs. See the coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession	Attribute and target based on Barron et al. (2011). A mosaic of European dry heath (4030) vegetation and maritime grassland occurs on the slopes above the sea cliff vegetation at Howth Head SAC. See the coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Attribute and target based on Barron et al. (2011). See the coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)	In places, the cliffs at Howth Head SAC comprise fairly sheer, exposed rock faces. The maritime flora is of particular interest as a number of scarce and local plants have been recorded. Some of these are species of ledges on hard cliffs and coastal heath. See the coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage	Negative indicator species (including non-natives) to represent less than 5% cover	Attribute and target based on Barron et al. (2011). Hottentot fig (*Carpobrotus edulis*) is an aggressive invader of coastal habitats that poses a serious ecological threat. The first record for hottentot fig in the wild in Ireland is from Howth Head in 1962 (Reynolds, 2002). See the coastal habitats supporting document for further details
Vegetation composition: bracken and woody species	Percentage	Cover of bracken (*Pteridium aquilinum*) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%	Attribute and target based on Barron et al. (2011). Bracken occurs on the cliffs tops at Howth Head and there is some scrub encroachment on the heath. See the coastal habitats supporting document for further details

4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in Howth Head SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	European dry heath has not been mapped in detail for Howth Head SAC and thus the total area of the qualifying habitat is unknown. Dry heath is the dominant habitat within the SAC and occurs on the slopes above the sea cliffs and in the central part of the peninsula. The habitat occurs in mosaic with other habitats, such dry grassland and exposed rock in places (NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See note on area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The diversity of dry heath communities within this SAC is unknown. Information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding *Campylopus* and *Polytrichum* mosses	Attribute and target based on Perrin et al. (2014). Dry heath is not necessarily rich in lichen and bryophyte species, but a minimum amount should still be present
Vegetation composition: number of positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least two	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. Bell heather (*Erica cinerea*), ling (*Calluna vulgaris*) and western gorse (*Ulex gallii*) are listed as present in the dry heath in this SAC (NPWS internal files)
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented
Vegetation composition: dwarf shrub composition	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle (*Myrica gale*), creeping willow (*Salix repens*) and western gorse (*Ulex gallii*) is less than 50%	Attribute and target based on Perrin et al. (2014). Bog-myrtle is indicative of flushed conditions and is more characteristic of wet heaths and blanket bogs. Creeping willow is more characteristic of dune heaths. Western gorse is a component of dry heath, but high proportions of it may indicate a history of undesirable levels of grazing
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habiat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances. Rhododendron (*Rhododendron ponticum*) occurs in places on dry heath in this SAC
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing

Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here
Vegetation structure: senescent ling	Percentage cover at a representative number of 2m x 2m monitoring stops	Senescent proportion of ling (*Calluna vulgaris*) cover less than 50%	Attribute and target based on Perrin et al. (2014). Senescence is part of the natural cycle of ling, but a dominance of ling in the senescent phase would indicate a lack of management (appropriate grazing or burning) to promote ling regeneration
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. Fires can be part of the natural cycle of dry heath and may also be used as a valuable management tool to promote a diversity of growth phases in ling (*Calluna vulgaris*). However, fires which are too intense, too frequent, too extensive or which occur in sensitive areas are damaging to the habitat
Vegetation structure: growth phases of ling	Percentage cover in local vicinity of a representative number of monitoring stops	Outside sensitive areas, all growth phases of ling (*Calluna vulgaris*) should occur throughout, with at least 10% of cover in the mature phase	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is also presented. The growth phases of ling are pioneer (<10cm high), building (10-30cm high) and mature (<30cm high). As burning is undesirable in sensitive areas, it is not reasonable to require the stated diversity of growth phases within these areas
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human foot prints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Curtis and McGough, 1988; Lockhart et al., 2012)



Legend

Howth Head SAC 000202

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
HOWTH HEAD SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

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

SITE CODE:
SAC 000202; version 3.02 CO. DUBLIN

0 0.25 0.5 0.75 1 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann.

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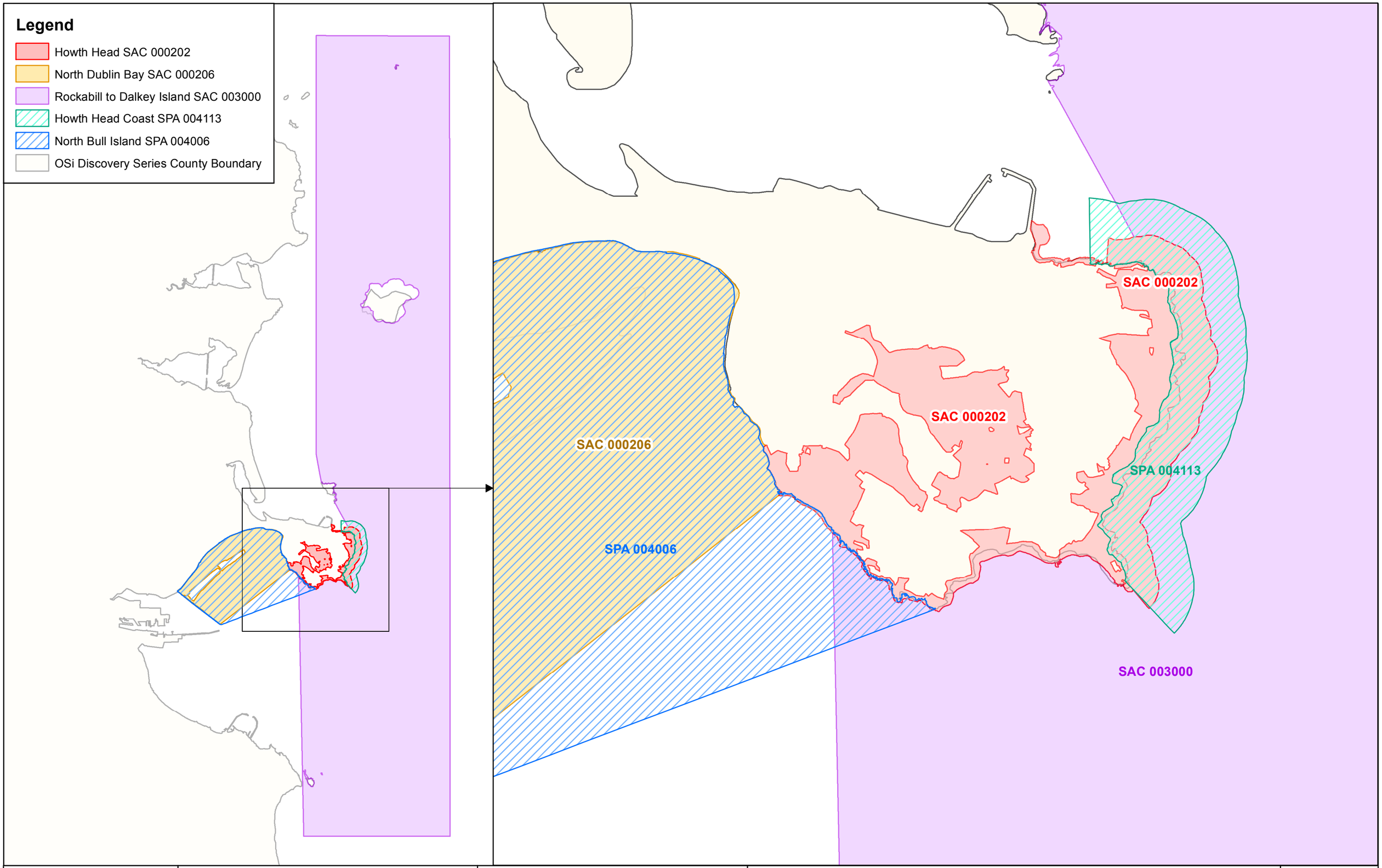
Map Version 1
Date: July 2016



An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 2:
HOWTH HEAD SAC
CONSERVATION OBJECTIVES
ADJOINING, OVERLAPPING AND ADJACENT DESIGNATIONS

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

SITE CODE:
SAC 000202; version 3.02. SAC 000206; version 3. SAC 003000; version 3.02. SPA 004113; version 3. SPA 004006; version 3 CO. DUBLIN

0 3 6 9 12 km

N

Map Version 1
Date: Oct 2016

Legend

- Howth Head SAC 000202
- 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

MAP 3:
HOWTH HEAD SAC
CONSERVATION OBJECTIVES
VEGETATED SEA CLIFFS

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

SITE CODE:
SAC 000202; version 3.02.
CO. DUBLIN

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: Oct 2016

Conservation objectives for Ireland's Eye SPA [004117]

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Bird Code	Common Name	Scientific Name
A017	Cormorant	*Phalacrocorax carbo*
A184	Herring Gull	*Larus argentatus*
A188	Kittiwake	*Rissa tridactyla*
A199	Guillemot	*Uria aalge*
A200	Razorbill	*Alca torda*

Citation: *NPWS (2018) Conservation objectives for Ireland's Eye SPA [004117]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.*

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

North Bull Island SPA 004006

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

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

7 Ely Place, Dublin 2, Ireland.

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

Citation:

NPWS (201p) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editor: Rebecca Jeffrey

ISSN 2009-4086

Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

004006 North Bull Island SPA

A046	Light-bellied Brent Goose *Branta bernicla hrota*
A048	Shelduck *Tadorna tadorna*
A052	Teal *Anas crecca*
A054	Pintail *Anas acuta*
A056	Shoveler *Anas clypeata*
A130	Oystercatcher *Haematopus ostralegus*
A140	Golden Plover *Pluvialis apricaria*
A141	Grey Plover *Pluvialis squatarola*
A143	Knot *Calidris canutus*
A144	Sanderling *Calidris alba*
A149	Dunlin *Calidris alpina alpina*
A156	Black-tailed Godwit *Limosa limosa*
A157	Bar-tailed Godwit *Limosa lapponica*
A160	Curlew *Numenius arquata*
A162	Redshank *Tringa totanus*
A169	Turnstone *Arenaria interpres*
A179	Black-headed Gull *Chroicocephalus ridibundus*
A999	Wetlands

Please note that this SPA overlaps with North Dublin Bay SAC (000206) and Rockabill to Dalkey Island SAC (003000). It adjoins Howth Head SAC (000202) and South Dublin Bay and River Tolka Estuary SPA (004024). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2014
Title :	North Bull Island SPA (site code: 4006) and South Dublin Bay and River Tolka Estuary SPA (site code: 4024) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

Spatial data sources

Year :	2014
Title :	NPWS SPA boundary data
GIS Operations :	SPA boundary polygons divided into two classifications (wetlands, terrestrial) based on line identified by expert judgement. Expert opinion used as necessary to resolve any issues arising
Used For :	Wetlands (map 3)

A046 Light-bellied Brent Goose *Branta bernicla hrota*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part fiveof the conservation objectives supporting document

A048 **Shelduck *Tadorna tadorna***

To maintain the favourable conservation condition of Shelduck in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A054 **Pintail *Anas acuta***

To maintain the favourable conservation condition of Pintail in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by pintail, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A141 Grey Plover *Pluvialis squatarola*

To maintain the favourable conservation condition of Grey Plover in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A143 **Knot *Calidris canutus***

To maintain the favourable conservation condition of Knot in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A144 Sanderling *Calidris alba*

To maintain the favourable conservation condition of Sanderling in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A156 Black-tailed Godwit *Limosa limosa*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A169 Turnstone *Arenaria interpres*

To maintain the favourable conservation condition of Turnstone in North Bull Island SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : North Bull Island SPA [004006]

A999 Wetlands

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

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1,713 hectares, other than that occurring from natural patterns of variation. See map 3	The wetland habitat area was estimated as 1,713ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

Legend

North Bull Island SPA 004006

MAP 1:
NORTH BULL ISLAND SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

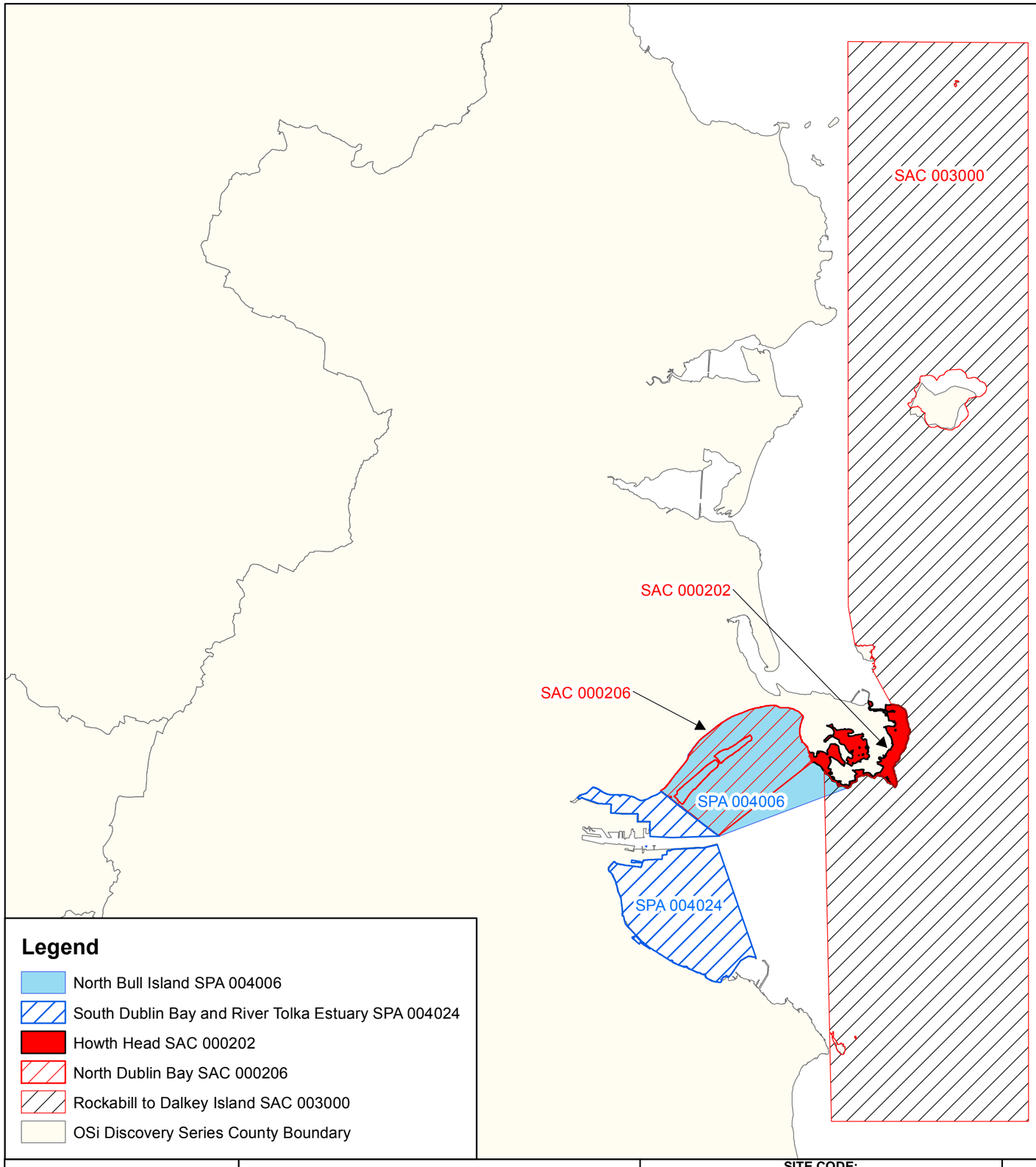
SITE CODE:
SPA 004006; version 2. CO. DUBLIN

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: Sep 2014

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



Legend

- North Bull Island SPA 004006
- South Dublin Bay and River Tolka Estuary SPA 004024
- Howth Head SAC 000202
- North Dublin Bay SAC 000206
- Rockabill to Dalkey Island SAC 003000
- OSi Discovery Series County Boundary

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

MAP 2:
NORTH BULL ISLAND SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATIONS

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

SITE CODE:
SPA 004006; version 2, SPA 004024; version 2.
SAC 000202; version 3, SAC 000206; version 3,
SAC 003000; version 3. CO. DUBLIN

0 2 4 6 8 10 km

N

Map Version 1
Date: Sep 2014

Legend

North Bull Island SPA 004006

OSi Discovery Series County Boundary

Wetlands and Waterbirds

Wetlands

Terrestrial

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Department of
Arts, Heritage and the Gaeltacht

MAP 3:
NORTH BULL ISLAND SPA
CONSERVATION OBJECTIVES
WETLANDS AND WATERBIRDS

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

SITE CODE:
SPA 004006; version 2. CO. DUBLIN

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: Sep 2014

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Baldoyle Bay SPA 004016

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta

Department of
Arts, Heritage and the Gaeltacht

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

7 Ely Place, Dublin 2, Ireland.

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

Citation:

NPWS (2013) Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

004016	Baldoyle Bay SPA
A046	Brent Goose *Branta bernicla hrota*
A048	Shelduck *Tadorna tadorna*
A137	Ringed Plover *Charadrius hiaticula*
A140	Golden Plover *Pluvialis apricaria*
A141	Grey Plover *Pluvialis squatarola*
A157	Bar-tailed Godwit *Limosa lapponica*
A999	Wetlands

Please note that this SPA overlaps with Baldoyle Bay SAC (000199). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping SAC as appropriate.

Supporting documents, relevant reports & publications

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

Year :	2012
Title :	Baldoyle Bay SPA (site code 4016) Conservation Objectives Supporting Document V1
Author :	NPWS
Series :	Unpublished report to NPWS

A046 Brent Goose *Branta bernicla hrota*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A137 Ringed Plover *Charadrius hiaticula*

To maintain the favourable conservation condition of Ringed Plover in Baldoyle Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

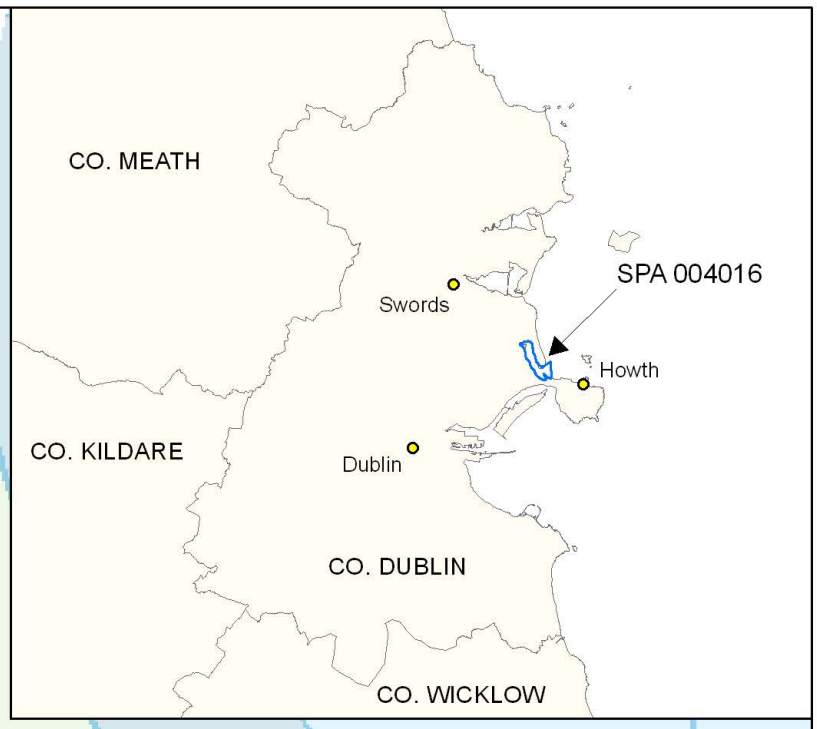
To maintain the favourable conservation condition of Bar-tailed Godwit in Baldoyle Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Baldoyle Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 263ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document



Portmarnock Bridge
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Baldoyle
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Portmarnock Point
Baile Dúill
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1MP
L.C.
Sutton
Cill Fhionntain
Sch

Legend

SPA 004016

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Department of Arts, Heritage and the Gaeltacht

MAP 1: BALDOYLE BAY SPA CONSERVATION OBJECTIVES SPA DESIGNATION

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

SITE CODE: SPA 004016 Version 1.04

0 250 500 m

N

Map Version 1
Date: Nov 2012

004016

000199

Legend

- SPA 004016 Baldoyle Bay
- SAC 000199 Baldoyle Bay
- OSi Discovery Series County Boundaries

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Arts, Heritage and the Gaeltacht

MAP 2:
BALDOYLE BAY SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATIONS

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

SITE CODE:
SPA 004016 Version 1.04
SAC 000199 Version 1.02

0 0.5 1 km

N

Map Version 1
Date: Nov 2012

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Malahide Estuary SPA 004025

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
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Citation:

NPWS (2013) Conservation Objectives: Malahide Estuary SPA 004025. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

004025 Malahide Estuary SPA

A005	Great Crested Grebe *Podiceps cristatus*
A046	Brent Goose *Branta bernicla hrota*
A048	Shelduck *Tadorna tadorna*
A054	Pintail *Anas acuta*
A067	Goldeneye *Bucephala clangula*
A069	Red-breasted Merganser *Mergus serrator*
A130	Oystercatcher *Haematopus ostralegus*
A140	Golden Plover *Pluvialis apricaria*
A141	Grey Plover *Pluvialis squatarola*
A143	Knot *Calidris canutus*
A149	Dunlin *Calidris alpina alpina*
A156	Black-tailed Godwit *Limosa limosa*
A157	Bar-tailed Godwit *Limosa lapponica*
A162	Redshank *Tringa totanus*
A999	Wetlands

Please note that this SPA overlaps with Malahide Estuary SAC (000205). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2013
Title :	Malahide Estuary SPA (site code 4025) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

A005 Great Crested Grebe *Podiceps cristatus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great crested grebe, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Brent Goose *Branta bernicla hrota*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A054 Pintail *Anas acuta*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by pintail, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A067 Goldeneye *Bucephala clangula*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by goldeneye, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A143 Knot *Calidris canutus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A149 Dunlin *Calidris alpina alpina*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A156 Black-tailed Godwit *Limosa limosa*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

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

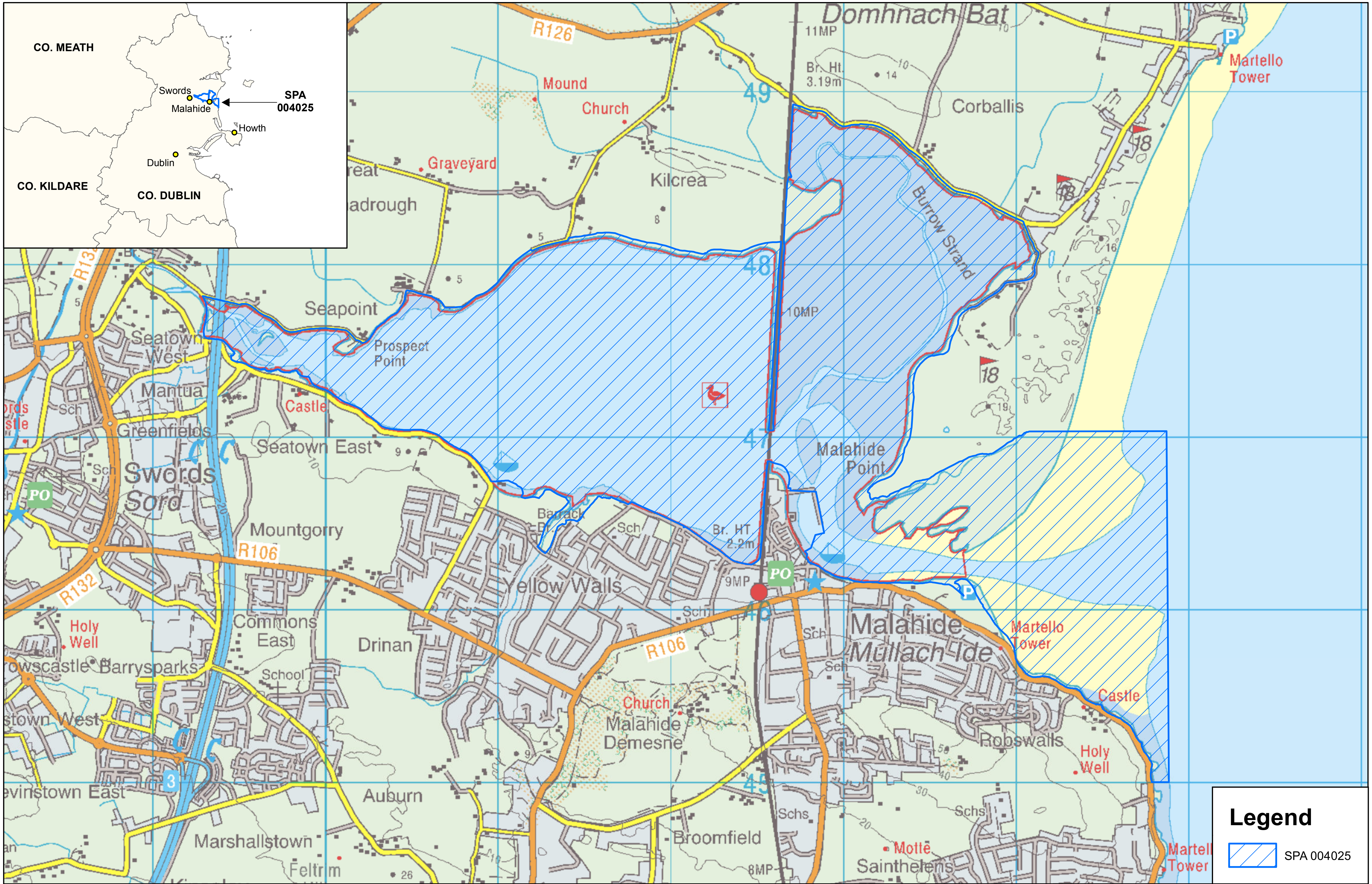
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Malahide Estuary SPA [004025]

A999 Wetlands

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

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 765 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 765ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document



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Department of Arts, Heritage and the Gaeltacht

MAP 1:
MALAHIDE ESTUARY SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

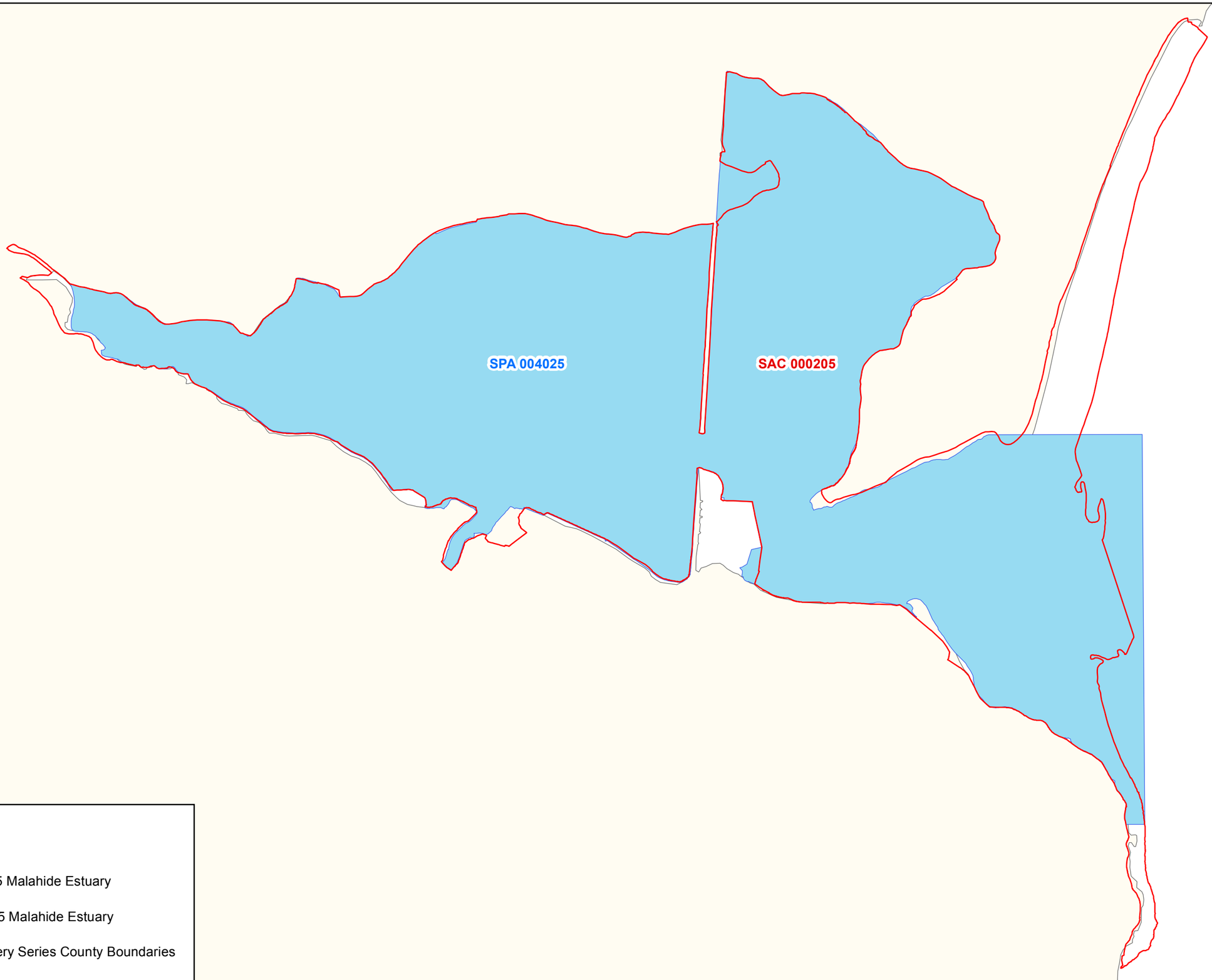
0 0.5 1 km

N

Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059212).

Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059212)

Site Code
SPA 004025
Version: 1.03
Map Version 1
Date: March 2013



Legend

- SPA 004025 Malahide Estuary
- SAC 000205 Malahide Estuary
- OSi Discovery Series County Boundaries

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

MAP 2:
MALAHIDE ESTUARY SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING
DESIGNATIONS

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

0 0.5 1 km

N

Site Code
SPA 004025 version 1.03
SAC 000205 version 1.02
Map Version 1
Date: March 2013

Conservation objectives for Lambay Island SPA [004069]

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Objective: To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Bird Code	**Common Name**	**Scientific Name**
A009	Fulmar	*Fulmarus glacialis*
A017	Cormorant	*Phalacrocorax carbo*
A018	Shag	*Phalacrocorax aristotelis*
A043	Greylag Goose	*Anser anser*
A183	Lesser Black-backed Gull	*Larus fuscus*
A184	Herring Gull	*Larus argentatus*
A188	Kittiwake	*Rissa tridactyla*
A199	Guillemot	*Uria aalge*

A200	Razorbill	*Alca torda*
A204	Puffin	*Fratercula arctica*

Citation: *NPWS (2018) Conservation objectives for Lambay Island SPA [004069]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.*

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

South Dublin Bay and River Tolka Estuary SPA 004024

An Roinn
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E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (201p) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

004024	South Dublin Bay and River Tolka Estuary SPA
A046	Light-bellied Brent Goose *Branta bernicla hrota*
A130	Oystercatcher *Haematopus ostralegus*
A137	Ringed Plover *Charadrius hiaticula*
A141	Grey Plover *Pluvialis squatarola*
A143	Knot *Calidris canutus*
A144	Sanderling *Calidris alba*
A149	Dunlin *Calidris alpina alpina*
A157	Bar-tailed Godwit *Limosa lapponica*
A162	Redshank *Tringa totanus*
A179	Black-headed Gull *Chroicocephalus ridibundus*
A192	Roseate Tern *Sterna dougallii*
A193	Common Tern *Sterna hirundo*
A194	Arctic Tern *Sterna paradisaea*
A999	Wetlands

Please note that this SPA overlaps with South Dublin Bay SAC (000210). It adjoins North Bull Island SPA (004006) and North Dublin Bay SAC (000206). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2014
Title :	North Bull Island SPA (site code: 4006) and South Dublin Bay and River Tolka Estuary SPA (site code: 4024) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1995
Title :	Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds
Author :	Walsh, P.; Halley, D.J.; Harris, M.P.; del Nevo, A.; Sim, I.M.W.; Tasker, M.L.
Series :	JNCC, Peterborough
Year :	2008
Title :	Autumn roosting by terns in south Dublin Bay
Author :	Merne, O.J.; Madden, B.; Archer, E.; Porter, B.
Series :	Irish Birds 8: 335-340
Year :	2010
Title :	Terns roosting in Dublin Bay, autumn 2010
Author :	Merne, O.J.
Series :	Irish Birds 9: 126-128
Year :	2014
Title :	BirdLife International Seabird Ecology and Foraging Range Database
Author :	BirdLife International
Series :	http://seabird.wikispaces.com
Year :	2014
Title :	Dublin Bay Birds Project - Dublin Port Tern Conservation Project; report for the 2014 season
Author :	Newton S.; Tierney N.; Whelan R.
Series :	BirdWatch Ireland and Dublin Port Company

Spatial data sources

Year :	2014
Title :	NPWS SPA boundary data
GIS Operations :	SPA boundary polygons divided into two classifications (wetlands, terrestrial) based on line identified by expert judgement. Expert opinion used as necessary to resolve any issues arising
Used For :	Wetlands (map 3)

A046 Light-bellied Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A137 Ringed Plover *Charadrius hiaticula*

To maintain the favourable conservation condition of Ringed Plover in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of conservation objectives supporting document

Conservation Objectives for : South Dublin Bay and River Tolka Estuary SPA [004024]

A141 **Grey Plover *Pluvialis squatarola***

Grey Plover is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species.

Attribute	Measure	Target	Notes

A143 Knot *Calidris canutus*

To maintain the favourable conservation condition of Knot in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A144 Sanderling *Calidris alba*

To maintain the favourable conservation condition of Sanderling in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A192 Roseate Tern *Sterna dougallii*

To maintain the favourable conservation condition of Roseate Tern in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Passage population: individuals	Number	No significant decline	Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. Up to 11,700, 9,025 and 8,020 terns were recorded in 2006, 2007 and 2010 respectively. Given the counting conditions (i.e. low light levels and long distance recording) it was rarely possible to identify the terns to species level but the majority of the birds appear to have been common terns (*Sterna hirundo*), with smaller numbers of Arctic and roseate terns (*S. paradisaea, S. dougallii*) (sandwich, little and black terns (*S. sandvicensis, S. albifrons, Chlidonias niger*) were also recorded) (Merne et al., 2008; Merne 2010). At least 645 roseate tern have been recorded here during the aforementioned survey years. This estimate does not factor in turnover rates and therefore the total number of roseate tern using this SPA may be significantly higher
Distribution: roosting areas	Number; location; area (hectares)	No significant decline	Merne et al. (2008) describe the main roosting area as the exposed sand banks in south Dublin Bay primarily between the Martello Towers at Sandymount (319524, 232021) and Williamstown (320796, 229979). Terns have been occasionally recorded outside of this area on adjacent sandflats extending to Irishtown/South Bull Wall and to Blackrock but these birds eventually join the birds roosting in the main area (Merne et al., 2008)
Prey biomass available	Kilogrammes	No significant decline	Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of terns arriving to the roosting area indicated that most flew in from an easterly and southeasterly direction leading the authors to suggest they were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). During the breeding season, roseate terns can make extensive use of marine waters adjacent to their breeding colonies. Key prey items: Small, schooling marine fish, very rarely small crustaceans. Key habitats: roseate tern forage in/over shallow and upwelling areas, including tide rips and shoals and over sandy bottoms. Foraging range: max. 30km, mean max. 18.28km, mean 12.3km (Birdlife International, 2014). As these foraging range estimates relate to birds during the breeding season, the distances between post-breeding roost sites and feeding areas may be greater

Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of terns arriving to the roosting area indicated that most flew in from an easterly and southeasterly direction leading the authors to suggest they were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). During the breeding season roseate terns can make extensive use of marine waters adjacent to their breeding colonies. Key habitats: roseate tern forage in/over shallow and upwelling areas, including tide rips and shoals and over sandy bottoms. Foraging range: max. 30km, mean max. 18.28km, mean 12.3km (Birdlife International, 2014). As these foraging range estimates relate to birds during the breeding season, the distances between post-breeding roost sites and feeding areas may be greater
Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	Merne et al. (2008) describes the main roosting area as the exposed sand banks in south Dublin Bay primarily between the Martello Towers at Sandymount (319524, 232021) and Williamstown (320796, 229979). Although principally used as a night roost, birds begin to roost at least one hour before sunset during the period July - September with peak activity occurring between mid-August and mid-September (Merne et al., 2008; Merne, 2010). Merne (2010) recorded significant disturbance events to the roosting terns caused by people with dogs off the leash and kite surfing

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). For more information on the history and recent population estimates of the tern colony at this SPA see Newton et al. (2014)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). For more information on the history and recent population estimates of the tern colony at this SPA see Newton et al. (2014)
Passage population: individuals	Number	No significant decline	Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. Up to 11,700, 9,025 and 8,020 terns were recorded in 2006, 2007 and 2010 respectively. Given the counting conditions (i.e. low light levels and long distance recording), it was rarely possible to identify terns to species level but the majority of the birds appear to have been common terns (*Sterna hirundo*), with smaller numbers of Arctic and roseate terns (*S. paradisaea, S. dougallii*); (sandwich, little and black terns (*S. sandvicensis, S. albifrons, Chlidonias niger*) were also recorded) (Merne et al., 2008; Merne 2010). At least 4,887 common tern have been recorded here during the aforementioned survey years. This estimate does not factor in turnover rates and therefore the total number of common tern using this SPA may be significantly higher
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	The common tern breeding colony in Dublin Bay is primarily sited on an artificial structure known as the 'ESB Dolphin' (see Newton et al., 2014)
Distribution: roosting areas	Number; location; area (Hectares)	No significant decline	Merne et al. (2008) describe the main roosting area as the exposed sand banks in south Dublin Bay, primarily between the Martello Towers of at Sandymount (319524, 232021) and Williamstown (320796, 229979). Terns have been occasionally recorded outside of this area on adjacent sandflats extending to Irishtown/South Bull Wall and to Blackrock but these birds eventually joined the birds roosting in the main area (Merne et al 2008)
Prey biomass available	Kilogrammes	No significant decline	During the breeding season, common terns can make extensive use of marine waters adjacent to their breeding colonies. Key prey items: Small fish, crustaceans, insects and occasionally squid. Key habitats: forage in/over shallow coastal waters, bays, inlets, shoals, tidal-rips, drift lines, beaches, saltmarsh creeks, lakes, ponds or rivers. Foraging range: max. 37km; mean max. 33.81km; mean 8.67km (Birdlife International, 2014). Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of arriving terns to the primary roosting area indicated that most flew into Dublin Bay from an easterly and southeasterly direction leading the authors to suggest they were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). Foraging ranges between post-breeding roost sites and feeding areas may be greater than the estimates given for the breeding season

Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	During the breeding season, common terns can make extensive use of marine waters adjacent to their breeding colonies. Foraging range: max. 37km; mean max. 33.81km; mean 8.67km (Birdlife International, 2014). Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of arriving terns to the primary roosting area indicated that most flew into Dublin Bay from an easterly and southeasterly direction leading the authors to suggest the bird were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). Foraging ranges between post-breeding roost sites and feeding areas may be greater than the estimates given for the breeding season
Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population	The common tern breeding colony in Dublin Bay is primarily sited on an artificial structure known as the 'ESB Dolphin' (see Newton et al., 2014)
Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns	Merne et al (2008) describes the main roosting area as the exposed sand banks in south Dublin Bay primarily between the Martello Towers at Sandymount (319524, 232021) and Williamstown (320796, 229979). Although principally used as a night roost, birds begin to roost at least one hour before sunset during the period July - September with peak activity occurring between mid-August and mid-September (Merne et al 2008; Merne 2010). Merne (2010) recorded significant disturbance events to the roosting terns caused by people with dogs off the leash and kite surfing

A194 Arctic Tern *Sterna paradisaea*

To maintain the favourable conservation condition of Arctic Tern in South Dublin Bay and River Tolka Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Passage population	Number of individuals	No significant decline	Evening surveys of roosting terns in South Dublin Bay and River Tolka Estuary SPA confirm the conservation importance of the south Dublin Bay area during the post-breeding/pre-migration period. Up to 11,700, 9,025 and 8,020 terns were recorded in 2006, 2007 and 2010 respectively. Given the counting conditions (i.e. low light levels and long distance recording) it was rarely possible to identify the terns to species level but the majority of the birds appear to have been common terns (*Sterna hirundo*), with smaller numbers of Arctic and roseate terns (*S. paradisaea, S. dougallii*); (sandwich, little and black terns (*S. sandvicensis, S. albifrons, Chlidonias niger*) were also recorded) (Merne et al., 2008; Merne 2010). At least 200 Arctic tern have been recorded here during the aforementioned survey years. This estimate does not factor in turnover rates and therefore the total number of Arctic tern using this SPA may be significantly higher
Distribution: roosting areas	Number; location; area (hectares)	No significant decline	Merne et al. (2008) describe the main roosting area as the exposed sand banks in south Dublin Bay primarily between the Martello Towers at Sandymount (319524, 232021) and Williamstown (320796, 229979). Terns have been occasionally recorded outside of this area on adjacent sandflats extending to Irishtown/South Bull Wall and to Blackrock but these birds eventually join the birds roosting in the main area (Merne et al., 2008)
Prey biomass available	Kilogrammes	No significant decline	Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of terns arriving to the roosting area indicated that most flew in from an easterly and southeasterly direction leading the authors to suggest they were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). During the breeding season Arctic terns can make extensive use of marine waters adjacent to their breeding colonies. Key prey items: Small fish, crustaceans and other invertebrates. Key habitats: forage in/over open waters and shallow bays, rocky shores, tidal flats, shoals, tide rips and ocean fronts. Foraging range: max. 20.6km, mean max. 12.24km, mean 11.75km (Birdlife International, 2014). As these foraging range estimates relate to birds during the breeding season, the distances between post-breeding roost sites and feeding areas may be greater

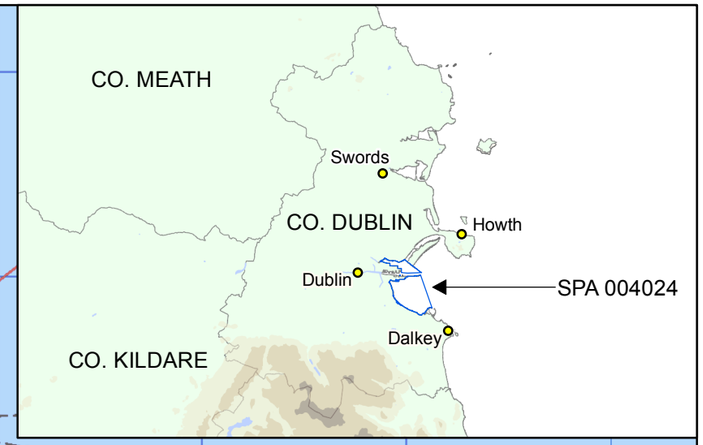
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area but direct survey evidence is incomplete. Evening observations of arriving terns to the primary roosting area indicated that most flew into Dublin Bay from an easterly and southeasterly direction leading the authors to suggest the birds were feeding in the shallow waters of the Kish/Bray and Burford Banks (Merne et al., 2008). During the breeding season Arctic terns can make extensive use of marine waters adjacent to their breeding colonies. Foraging range: max. 20.6km, mean max. 12.24km, mean 11.75km (Birdlife International, 2014). As these foraging range estimates relate to birds during the breeding season, the distances between post-breeding roost sites and feeding areas may be greater
Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of Arctic tern among the post-breeding aggregation of terns	Merne et al. (2008) describes the main roosting area as the exposed sand banks in south Dublin Bay primarily between the Martello Towers at Sandymount (319524, 232021) and Williamstown (320796, 229979). Although principally used as a night roost, birds begin to roost at least one hour before sunset during the period July - September with peak activity occurring between mid-August and mid-September (Merne et al., 2008; Merne, 2010). Merne (2010) recorded significant disturbance events to the roosting terns caused by people with dogs off the leash and kite surfing

Conservation Objectives for : South Dublin Bay and River Tolka Estuary SPA [004024]

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in South Dublin Bay and River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,192 hectares, other than that occurring from natural patterns of variation. See map 3	The wetland habitat area was estimated as 2,192ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document



Legend

South Dublin Bay and River Tolka Estuary SPA 004024

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Department of Arts, Heritage and the Gaeltacht

MAP 1:
SOUTH DUBLIN BAY AND RIVER TOLKA ESTUARY SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

SITE CODE:
SPA 004024; version 2. CO. DUBLIN

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sep 2014

SAC 000206

SPA 004006

SAC 000210

SPA 004024

Legend

- South Dublin Bay and River Tolka Estuary SPA 004024
- North Bull Island SPA 004006
- North Dublin Bay SAC 000206
- South Dublin Bay SAC 000210
- OSi Discovery Series County Boundary

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

MAP 2:
SOUTH DUBLIN BAY AND RIVER TOLKA ESTUARY SPA CONSERVATION OBJECTIVES ADJOINING / OVERLAPPING DESIGNATIONS

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

SITE CODE:
SPA 004006; version 2, SPA 004024: version 2.
SAC 000206: version 3, SAC 000210: version 3.
CO. DUBLIN

0 1 2 3 km

N

Map Version 1
Date: Sep 2014

Legend

South Dublin Bay and River Tolka Estuary SPA 004024

OSi Discovery Series County Boundary

Wetlands and Waterbirds

Wetlands

Terrestrial

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

MAP 3:
SOUTH DUBLIN BAY AND RIVER TOLKA ESTUARY SPA CONSERVATION OBJECTIVES WETLANDS AND WATERBIRDS

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

SITE CODE:
SPA 004024; version 2. CO. DUBLIN

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sep 2014

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Rogerstown Estuary SPA 004015

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

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Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

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

Qualifying Interests

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

004015	Rogerstown Estuary SPA
A043	Greylag Goose *Anser anser*
A046	Brent Goose *Branta bernicla hrota*
A048	Shelduck *Tadorna tadorna*
A056	Shoveler *Anas clypeata*
A130	Oystercatcher *Haematopus ostralegus*
A137	Ringed Plover *Charadrius hiaticula*
A141	Grey Plover *Pluvialis squatarola*
A143	Knot *Calidris canutus*
A149	Dunlin *Calidris alpina alpina*
A156	Black-tailed Godwit *Limosa limosa*
A162	Redshank *Tringa totanus*
A999	Wetlands

Please note that this SPA overlaps with Rogerstown Estuary SAC (000208). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2013
Title :	Rogerstown Estuary SPA (site code 4015) Conservation Objectives Supporting Document V1
Author :	NPWS
Series :	Conservation objectives supporting document

A043 Greylag Goose *Anser anser*

To maintain the favourable conservation condition of Greylag Goose in Rogerstown Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by greylag goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Brent Goose *Branta bernicla hrota*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Rogerstown Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A137 Ringed Plover *Charadrius hiaticula*

To maintain the favourable conservation condition of Ringed Plover in Rogerstown Estuary SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A143 Knot *Calidris canutus*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A149 Dunlin *Calidris alpina alpina*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A156 Black-tailed Godwit *Limosa limosa*

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

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

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

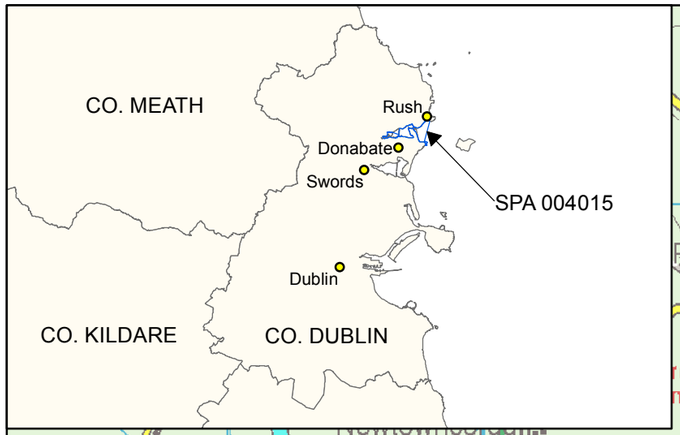
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Number, range, timing and intensity of use of area	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Rogerstown Estuary SPA [004015]

A999 Wetlands

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

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 646 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 646ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document



MAP 1:
ROGERSTOWN ESTUARY SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

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

SITE CODE: SPA 004015
CO. DUBLIN; version 1.02

0 0.25 0.5 0.75 1 km

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Department of Arts, Heritage and the Gaeltacht

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059212).

Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059212)

N

Map Version 1
Date: May 2013

Legend

SPA 004015

SPA 004015

SAC 000208

Legend

- Rogerstown Estuary SPA 004015
- Rogerstown Estuary SAC 000208
- OSi Discovery Series County Boundaries

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MAP 2:
ROGERSTOWN ESTUARY SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATION

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

SITE CODE: SPA 004015 CO. DUBLIN; version 1.02
SAC 000208 CO. DUBLIN; version 1.02

0 0.25 0.5 0.75 1 km

N

Map Version 1
Date: May 2013

Appendix II - Qualifying Interest Wintering Bird Species Survey Results

Techrete - Wintering Bird Surveys 2018 - 2019

KEY

HOURS FROM LOW TIDE	
-2.5	two and a half hours before low tide (EBBING TIDE)
2.5	two and a half hours after low tide (RISING TIDE)

SITE	
CL	Claremont Strand
DP	Deer Park Golf

HEIGHT CODES		M
1	BELOW HEIGHT OF SB1	<12
2	AT HEIGHT OF SB1	12
3	AT HEIGHT OF SB2	20
4	1.5X SB2	30
5	2X SB2	40
6	3X SB2	60
7	4X SB2	80
8	>4 SB2	>80

CODE	SPECIES	PEAK COUNT	1% NATIONAL	1% INTERNATIONAL
HG	HERRING GULL	959	-	10200
GB	G. BLACK B. GUL	97	-	4200
BH	BLACK HEADED (	31	-	20000
CM	COMMON GULL	8	-	16400
OC	OYSTERCATCHEI	43	690	8200
CU	CURLEW	47	350	8400
PB	BRENT GOOSE	27	360	400
RK	REDSHANK	2	300	3900
GK	GREENSHANK	5	20	2300
ET	LITTLE EGRET	1	20	1300
H.	HERON	3	25	2700
RP	RINGED PLOVER	75	100	730
CA	CORMORANT	2	120	1200
TT	TURNSTONE	13	95	1400
DN	DUNLIN	14	570	13300
RC	ROCK PIPIT			

Table 1. All Data by Species

GENERAL						SPECIES															WEATHER					TIDAL CYCLE							NOTES
Date	Observer	Site	Count no.	Start time	End time	HG	GB	BH	CM	OC	CU	PB	RK	GK	ET	H.	RP	CA	DN	BA	SU	TT	Wind	Cloud	Temp	Precip	Vis	High tide	Low tide	High tide	Low tide	Hours from low tide	Sunrise	Sunset		Total waterbirds
01/11/2018	DW	CL	1	07:37	08:05	106	3	3	0	13	4	0	1	0	0	1	0	1	0	0	0	0	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56		132
01/11/2018	DW	CL	2	08:37	09:01	161	15	5	0	16	3	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56		200
01/11/2018	DW	CL	3	09:37	09:55	91	20	8	0	15	3	0	1	1	0	1	0	0	0	0	0	0	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56		140
01/11/2018	DW	CL	4	10:37	11:08	121	13	6	0	29	3	0	1	0	0	0	0	0	0	0	0	0	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56		173
01/11/2018	DW	CL	5	11:37	12:02	152	9	8	0	19	2	0	0	0	0	0	0	0	0	0	0	0	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56		190
01/11/2018	DW	CL	6	12:37	12:58	98	8	6	0	9	2	0	2	0	0	0	0	0	0	0	0	0	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56		125
01/11/2018	DW	CL	7	13:48	14:08	82	13	7	0	12	0	0	0	0	0	0	0	0	0	0	0	0	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56		114
01/11/2018	DW	CL	8	14:39	14:50	35	2	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56		41
22/11/2018	DW	CL	1	08:57	09:09	8	1	0	0	13	0	0	1	3	0	0	0	0	0	0	0	10	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22		36
22/11/2018	DW	CL	2	09:50	10:03	5	2	0	0	18	0	0	2	3	0	0	0	0	0	0	0	10	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22		40
22/11/2018	DW	CL	3	10:57	11:20	59	1	4	0	10	0	0	1	3	0	0	0	1	0	0	0	5	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22		84
22/11/2018	DW	CL	4	11:50	12:04	1	0	7	0	18	0	0	1	2	0	0	0	0	0	0	0	7	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22		36
22/11/2018	DW	CL	5	12:51	13:08	28	6	3	0	3	0	0	1	0	0	0	0	0	0	0	0	0	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22		41
22/11/2018	DW	CL	6	13:57	14:30	139	15	15	0	11	4	0	2	0	0	1	0	0	0	0	0	0	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22		187
22/11/2018	DW	CL	7	14:56	15:25	142	27	13	0	14	7	0	1	0	0	0	0	0	0	0	0	0	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22		204
22/11/2018	DW	CL	8	15:58	16:17	85	15	21	0	8	1	0	0	0	0	0	0	0	0	0	0	0	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22		130
04/12/2018	DW	CL	1	08:14	08:28	14	0	2	0	43	2	0	0	3	0	0	0	2	0	0	0	0	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11		66
04/12/2018	DW	CL	2	09:15	09:37	19	3	1	0	32	0	0	0	3	0	0	0	0	0	0	0	0	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11		58
04/12/2018	DW	CL	3	10:13	10:23	16	2	1	0	25	0	0	0	3	0	0	0	0	0	0	0	0	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11		47
04/12/2018	DW	CL	4	11:13	11:26	38	5	6	0	19	0	0	0	2	0	0	0	0	0	0	0	0	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11		70
04/12/2018	DW	CL	5	12:11	12:31	116	19	10	0	12	3	11	1	0	1	1	0	1	0	0	0	0	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11		175
04/12/2018	DW	CL	6	13:25	13:50	141	6	7	0	18	3	2	1	0	0	1	0	1	0	0	0	0	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11		180
04/12/2018	DW	CL	7	14:16	14:38	103	16	13	0	16	4	2	1	0	0	0	0	0	0	0	0	0	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11		155
04/12/2018	DW	CL	8	15:12	15:32	88	14	18	0	14	2	5	1	0	0	1	0	0	0	0	0	0	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11		143
19/12/2018	DW	CL	1	09:35	09:50	59	2	5	0	15	0	0	0	5	0	0	37	1	0	0	0	4	3	1	6	1	4	08:42	14:19	20:55	-	-4.61				128
19/12/2018	DW	CL	2	10:35	10:49	52	0	5	0	24	0	0	0	1	0	0	2	0	0	0	0	0	4	3	6	1	4	08:42	14:19	20:55	-	-3.62				84
19/12/2018	DW	CL	3	11:33	11:50	75	13	11	0	7	0	0	0	0	0	0	0	0	0	0	0	0	4	2	7	1	4	08:42	14:19	20:55	-	-2.63				106
19/12/2018	DW	CL	4	12:33	12:50	185	19	13	0	12	0	0	0	0	0	0	0	0	0	0	0	0	3	2	8	1	4	08:42	14:19	20:55	-	-1.63				229
19/12/2018	DW	CL	5	13:38	13:59	122	19	7	0	2	12	0	0	0	0	0	0	1	0	0	0	0	4	3	8	1	4	08:42	14:19	20:55	-	-0.51				163
19/12/2018	DW	CL	6	14:38	15:00	90	24	21	0	31	2	0	0	0	0	0	0	0	0	0	0	0	4	3	8	1	4	08:42	14:19	20:55	-	0.50				168
19/12/2018	DW	CL	7	15:35	15:50	78	13	17	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	3	8	1	4	08:42	14:19	20:55	-	1.39				110
11/01/2019	DW	CL	1	08:56	09:38	460	97	22	0	28	25	4	0	0	0	3	0	0	0	0	0	0	2	4	7	1	4	-	08:08	14:50	20:41	1.15				639
11/01/2019	DW	CL	2	09:55	10:32	587	62	27	0	41	8	0	0	0	0	2	0	0	0	0	0	0	2	4	7	1	4	-	08:08	14:50	20:41	2.09				727
11/01/2019	DW	CL	3	10:55	11:18	329	39	8	0	4	0	0	1	0	0	0	0	0	0	0	0	0	2	4	8	1	4	-	08:08	14:50	20:41	2.98				381
11/01/2019	DW	CL	4	11:57	12:14	106	15	3	0	4	0	0	1	1	0	0	0	0	0	0	0	0	2	4	8	1	4	-	08:08	14:50	20:41	3.96				130
11/01/2019	DW	CL	5	12:55	13:09	10	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3	9	1	4	-	08:08	14:50	20:41	4.90				13
11/01/2019	DW	CL	6	13:59	14:07	6	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	3	9	1	4	-	08:08	14:50	20:41	5.92				10
11/01/2019	DW	CL	7	14:56	15:05	5	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	3	9	1	4	-	08:08	14:50	20:41	-5.68				9
11/01/2019	DW	CL	8	15:55	16:05	9	2	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	3	9	1	4	-	08:08	14:50	20:41	-4.68				16
16/01/2019	DW	CL	1	09:45	10:06	193	20	0	0	3	0	27	0	0	0	0	0	0	0	0	0	0	4	1	6	1	4	-	00:12	06:51	12:38	-2.71				243
16/01/2019	DW	CL	2	10:47	11:15	360	40	20	0	16	8	2	0	0	0	0	0	0	0	0	0	0	4	1	6	1	4	-	00:12	06:51	12:38	-1.62				446
16/01/2019	DW	CL	3	11:48	12:20	547	59	31	0	37	12	0	1	0	0	0	0	0	0	0	0	0	4	2	7	1	4	-	00:12	06:51	12:38	-0.57				687
16/01/2019	DW	CL	4	12:50	13:21	959	61	29	0	15	5	4	0	0	0	0	0	0	0	0	0	0	4	3	7	1	4	-	00:12	06:51	12:38	0.46			480 UU outside survey area to N (feeding frenzy at sea)	1073
16/01/2019	DW	CL	5	13:48	14:15	868	47	27	0	11	6	5	0	0	0	0	0	0	0	0	0	0	4	3	7	1	4	-	00:12	06:51	12:38	1.39			480 UU outside survey area to N (feeding frenzy at sea)	964
16/01/2019	DW	CL	6	14:46	15:11	201	10	4	0	13	6	0	2	0	0	0	0	0	0	0	0	0	4	4	7	3	4	-	00:12	06:51	12:38	2.34				236
16/01/2019	DW	CL	7	15:50	16:10	85	2	12	0	10	4	0	2	0	0	0	0	0	0	0	0	0	3	4	6	4	3	-	00:12	06:51	12:38	3.37				115
16/01/2019	DW	CL	8	16:58	17:04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	6	4	2	-	00:12	06:51	12:38	4.37				0
24/01/2019	DW	CL	1	08:47	09:16	439	58	12	8	16	2	7	0	0	0	0	0	0	0	0	0	0	3	4	5	3	3	01:41	07:07	13:55	19:40	1.91	08:22	16:50		542
24/01/2019	DW	CL	2	09:45	10:16	296	49	21	0	6	0	0	0	0	0	0	0	0	0	0	0	0	3	4	6	4	2	01:41	07:07	13:55	19:40	2.89	08:22	16:50		372
24/01/2019	DW	CL	3	10:47	11:08	89	7	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	3	4	7	4	2	01:41	07:07	13:55	19:40	3.84	08:22	16:50		102
24/01/2019	DW	CL	4	11:48	12:10	80	4	5	0	8	0	0	0	0	0	0	13	0	0	0	0	2	2	4	7	4	2	01:41	07:07	13:55	19:40	4.87	08:22	16:50		112
24/01/2019	DW	CL	5	12:47	13:07	6	1	6	0	10	0	0	0	0	0	0	12	0	0	0	0	2	3	4	7	3	2	01:41	07:07	13:55	19:40	5.83	08:22	16:50		37
24/01/2019	DW	CL	6	13:45	14:02	25	0	5	0	10	0	0	0	0	0	0	35	0	0	0	0	0	3	4	7	4	2	01:41	07:07	13:55	19:40	-5.78	08:22	16:50		75
24/01/2019	DW	CL	7	14:43	15:03	44	3	10	0	12	0	0	0	0	0	0	17	0	0	0	0	0	3	4	7	2	2	01:41	07:07	13:55	19:40	-4.78	08:22	16:50		86
30/01/2019	DW	CL	1	09:58	10:21	299	13	0	0	14	0	5	1	0	0	0	0	0	0	0	0	0	4	1	-1	1	4	-	00:37	07:21	13:04	-2.91				332
30/01/2019	DW	CL	2	10:58	11:26	435	34	0	0	15	0	0	1	0	0	0	0	0	0	0	0	0	3	1	0	1	4	-	00:37	07:21	13:04	-1.87				485
30/01/2019	DW	CL	3	11:57	12:28	512	33	10	1	7	19	0	1	0	0	0	0	0	0	0	0	0	3	1	1	1	4	-	00:37	07:21	13:04	-0.86			200 UU past boundary to N at sea	583
30/01/2019	DW	CL	4	13:01	13:37	586	40	2	5	10	1	0	0	0	0	1	0	0	0	0	0	0	3	2	1	1	4	-	00:37	07:21	13:04	0.25				645
30/01/2019	DW	CL	5	13:58	14:28	330	28	4	3	7	0	0	0	0	0	0	0	0	0	0	0	0	3	1	2	1	4	-	00:37	07:21	13:04	1.15				372
30/01/2019	DW	CL	6	15:03	15:29	199	16	5	0	13	0	0	0	1	0	0	0	0	0	0	0	0	3	1	3	1	4	-	00:37	07:21	13:04	2.20				234
30/01/2019	DW	CL	7	15:59	16:17	108	0	4	1	7	0	0	1	0	0	0	0	0	0	0	0	0	3	1	2	1	4	-	00:37	07:21	13:04	3.07				121
06/02/2019	DW	CL	1	08:39	08:57	65	50	6	0	11	1	0	0	0	0	0	0	1	0	0	0	0	3	2	5	1	4	00:30	06:00	12:38	18:27	2.80				134
06/02/2019	DW	CL	2	09:35	09:50	16	2	5	0	12	0	0	0	2	0	1	31	2	0	0	0	3	3	2	6	1	4	00:30	06:00	12:38	18:27	3.71				74
06/02/2019	DW	CL	3	10:34	10:48	7	1	5	0	14	0	2	0	3	0	0	74	0	0	0	0	7	3	2	7	1	4	00:30	06:00	12:38	18:27	4.68				113
06/02/2019	DW	CL	4	11:35	11:51	5	0	8	0	13	0	2	0	3	0	0	74	0	0	0	0	13	4	2	8	1	4	00:30	06:00	12:38	18:27	5.72				118
06/02/2019	DW	CL	5	12:35	12:50	11	0	8	0	14	0	2	0	2	0	0	75	0	0	0	0	9	3	1	9	1	4	00:30	06:00	12:38	18:27	-5.74				121
06/02/2019	DW	CL	6	13:35	13:48	21	0	15	0	14	0	2	0	2	0	0	8	0	0	0	0	11	3	3	9	1	4	00:30	06:00	12:38	18:27	-4.76				73
06/02/2019	DW	CL	7	14:33	14:48	11	1	8	0	10	0	2	0	0	0	0	1	0	0	0	0	10	3	2	10	1	4	00:30	06:00	12:38	18:27	-3.78				43
06/02/2019	DW	CL	8	15:32	15:45	69	8	7	0	13	0	7	0	1	0	0	0	0	0	0	0	5	3	3	10	1	4	00:30	06:00	12:38	18:27	-2.81				110
14/02/2019	DW	CL	1	10:20	10:42	158	36	10	0	6	2	0	1	0	0	0	0	0	0	0	0	0	3	1	9	1	4	06:07	11:55	18:38	-	-1.40			45 UU to NW of study area	213
14/02/2019	DW	CL	2	11:20	11:48	197	25	6	0	6	4	0	0	0	0	0	0	0	0	0	0	0	4	1	10	1	4	06:07	11:55	18:38	-	-0.35			42 UU in sea to N of study area and 180 UU on sandbar in distance to NW of stud	238
14/02/2019	DW	CL	3	12:19	12:44	130	9	0	0	6	3	0	1	0	0	0	0	0	0	0	0	0	5	2	11	1	4	06:07	11:55	18:38	-	0.61				149
14/02/2019	DW	CL	4	13:20	13:42	105	9	3	0	7	1	0	0	0	0	0	0	0	0	0	0	0	5	2	11	1	4	06:07	11:55	18:38	-	1.60				125
14/02/2019	DW	CL	5	14:17	14:38	76	16	13	0	3	0	9	0	0	0	0	0	0	0	0	0	0	5	2	11	1	4	06:07	11:55	18:38	-	2.54				117
14/02/2019	DW	CL	6	15:18	15:32	30	2	13	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6	2	11	1	4	06:07	11:55	18:38	-	3.50				46
14/02/2019	DW	CL	7	16:19	16:30	0	0	12	0	2	0	4	0	1	0	1	0	0	0	0	0	1	6	2	10	1	4	06:07	11:55	18:38	-	4.49				21

14/02/2019	DW	CL	8	17:03	17:14	1	0	18	0	17	0	2	1	1	0	0	0	0	14	0	0	5	6	2	10	1	3	06:07	11:55	18:38	-	5.23				59
21/02/2019	DW	CL	1	08:04	08:23	125	33	0	0	6	1	4	0	0	0	0	0	0	0	0	0	0	3	2	11	1	4	00:34	06:03	12:48	18:34	2.18	07:31	17:46		169
21/02/2019	DW	CL	2	09:02	09:19	47	25	0	0	11	0	2	1	3	0	0	11	0	0	0	0	2	3	2	11	1	4	00:34	06:03	12:48	18:34	3.13	07:31	17:46		102
21/02/2019	DW	CL	3	10:02	10:18	11	2	2	0	11	0	0	0	2	0	0	3	0	0	0	0	9	3	2	11	1	4	00:34	06:03	12:48	18:34	4.12	07:31	17:46		40
21/02/2019	DW	CL	4	11:00	11:17	2	33	0	0	3	0	0	0	1	0	0	0	0	12	0	0	9	3	2	12	1	4	00:34	06:03	12:48	18:34	5.09	07:31	17:46		60
21/02/2019	DW	CL	5	12:03	12:16	9	2	0	0	5	0	0	0	1	0	0	0	1	12	0	0	7	3	2	13	1	4	00:34	06:03	12:48	18:34	6.11	07:31	17:46		37
21/02/2019	DW	CL	6	13:02	13:16	13	0	3	0	4	0	2	0	0	0	0	0	0	0	0	0	1	4	3	14	1	4	00:34	06:03	12:48	18:34	-5.42	07:31	17:46		23
21/02/2019	DW	CL	7	14:00	14:12	31	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	4	4	3	14	1	4	00:34	06:03	12:48	18:34	-4.47	07:31	17:46		47
21/02/2019	DW	CL	8	15:00	15:14	33	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7	4	3	14	1	4	00:34	06:03	12:48	18:34	-3.45	07:31	17:46		47
28/02/2019	DW	CL	1	10:35	10:56	103	20	3	0	14	1	2	1	0	0	0	0	1	0	0	0	0	2	4	8	1	2	-	00:00	06:42	12:36	-1.84	07:15	18:00	25 UU north of 1	145
28/02/2019	DW	CL	2	11:36	11:58	122	15	1	0	12	2	0	0	0	0	0	0	0	0	0	0	0	2	4	8	1	2	-	00:00	06:42	12:36	-0.82	07:15	18:00	64 UU north of 1	152
28/02/2019	DW	CL	3	12:30	12:52	150	12	1	0	9	5	0	0	0	0	1	0	0	0	0	0	0	3	4	8	1	3	-	00:00	06:42	12:36	0.08	07:15	18:00	50 UU north of 1	178
28/02/2019	DW	CL	4	13:34	13:56	184	24	4	0	20	4	0	0	0	0	2	0	0	0	0	0	0	3	3	9	1	4	-	00:00	06:42	12:36	1.15	07:15	18:00	50UU outside study area	238
28/02/2019	DW	CL	5	14:30	14:52	76	5	1	0	19	0	4	0	0	0	0	0	0	0	0	0	0	3	3	9	1	4	-	00:00	06:42	12:36	2.08	07:15	18:00		105
28/02/2019	DW	CL	6	15:30	15:50	98	12	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	4	4	9	1	4	-	00:00	06:42	12:36	3.07	07:15	18:00		119
28/02/2019	DW	CL	7	16:30	16:48	102	11	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	4	4	9	1	4	-	00:00	06:42	12:36	4.05	07:15	18:00		126
28/02/2019	DW	CL	8	17:22	17:32	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	4	9	3	3	-	00:00	06:42	12:36	4.85	07:15	18:00		4
05/03/2019	DW	CL	1	07:33	07:50	18	11	0	0	7	2	8	1	0	0	0	0	0	0	0	0	0	5	2	5	1	4	-	04:27	11:03	16:53	3.24	07:04	18:09		47
05/03/2019	DW	CL	2	08:30	08:45	4	0	0	0	20	0	6	0	1	0	0	0	0	0	0	0	2	4	2	5	1	4	-	04:27	11:03	16:53	4.18	07:04	18:09		33
05/03/2019	DW	CL	3	09:31	09:43	1	0	0	0	16	0	15	0	3	0	0	2	0	0	0	0	7	3	2	7	1	4	-	04:27	11:03	16:53	5.17	07:04	18:09		44
05/03/2019	DW	CL	4	10:30	10:45	7	1	0	0	29	0	15	0	3	0	0	4	0	0	0	0	12	4	2	8	1	4	-	04:27	11:03	16:53	6.18	07:04	18:09		71
05/03/2019	DW	CL	5	11:30	11:45	35	8	1	0	14	0	2	0	2	0	0	0	1	0	0	0	11	4	2	9	1	4	-	04:27	11:03	16:53	-5.26	07:04	18:09		74
05/03/2019	DW	CL	6	12:30	12:48	16	2	2	0	13	0	2	0	0	0	0	11	0	0	0	0	10	4	2	9	1	4	-	04:27	11:03	16:53	-4.23	07:04	18:09		56
05/03/2019	DW	CL	7	13:30	13:47	104	12	1	0	7	0	4	1	0	0	0	0	0	0	0	0	1	4	2	9	1	4	-	04:27	11:03	16:53	-3.24	07:04	18:09		130
05/03/2019	DW	CL	8	14:30	14:53	280	37	3	0	5	0	13	0	0	0	0	0	0	0	0	0	0	4	3	9	1	4	-	04:27	11:03	16:53	-2.19	07:04	18:09		338
13/03/2019	DW	CL	1	11:05	11:25	47	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	7	2	8	1	4	03:31	09:12	15:56	21:43	2.05	06:45	18:24		52
13/03/2019	DW	CL	2	12:05	12:21	53	6	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	7	2	8	1	4	03:31	09:12	15:56	21:43	3.02	06:45	18:24		63
13/03/2019	DW	CL	3	13:05	13:22	8	0	0	0	20	0	8	1	1	0	0	0	0	0	0	0	0	6	3	9	1	4	03:31	09:12	15:56	21:43	4.03	06:45	18:24		38
13/03/2019	DW	CL	4	14:05	14:17	0	0	0	0	6	0	2	0	0	0	0	0	0	0	0	0	0	6	3	9	4	4	03:31	09:12	15:56	21:43	4.98	06:45	18:24		8
13/03/2019	DW	CL	5	15:05	15:19	3	1	0	0	0	0	7	0	0	0	0	5	0	0	0	0	0	5	4	9	1	4	03:31	09:12	15:56	21:43	6.00	06:45	18:24		16
13/03/2019	DW	CL	6	16:05	16:19	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	5	4	8	3	4	03:31	09:12	15:56	21:43	-5.52	06:45	18:24	No birds at usual high tide roost - likely due to stormy seas	8
13/03/2019	DW	CL	7	17:05	17:20	1	0	0	0	13	0	10	0	0	0	0	0	0	0	0	0	5	5	4	8	4	4	03:31	09:12	15:56	21:43	-4.51	06:45	18:24		29
13/03/2019	DW	CL	8	17:55	18:05	92	6	0	0	2	1	11	0	0	0	1	0	0	0	0	0	0	5	4	7	3	4	03:31	09:12	15:56	21:43	-3.72	06:45	18:24		113
20/03/2019	ME	CL	1	07:26	07:37	56	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	1	3	9	1	4	04:16	11:05	16:45	23:39	-3.56	06:30	18:36		74
20/03/2019	ME	CL	2	08:30	08:40	9	0	0	0	7	0	7	1	0	0	1	0	0	0	2	0	0	1	3	9	1	4	04:16	11:05	16:45	23:39	-2.50	06:30	18:36		27
20/03/2019	ME	CL	3	09:27	09:38	10	0	0	0	6	0	8	1	0	0	0	0	0	0	2	0	8	1	2	10	1	4	04:16	11:05	16:45	23:39	-1.54	06:30	18:36		35
20/03/2019	ME	CL	4	10:23	10:34	7	6	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	13	1	4	04:16	11:05	16:45	23:39	-0.61	06:30	18:36		15
20/03/2019	ME	CL	5	11:25	11:40	32	0	0	0	0	0	8	0	0	0	0	0	1	0	0	0	0	1	1	13	1	4	04:16	11:05	16:45	23:39	0.46	06:30	18:36		41
20/03/2019	ME	CL	6	12:30	12:40	31	14	0	0	0	0	10	0	0	0	0	0	1	0	0	0	0	1	1	16	1	4	04:16	11:05	16:45	23:39	1.50	06:30	18:36		56
20/03/2019	ME	CL	7	13:30	13:45	126	16	0	0	19	0	10	0	0	0	0	0	0	0	0	0	2	1	1	16	1	4	04:16	11:05	16:45	23:39	2.54	06:30	18:36		173
20/03/2019	ME	CL	8	14:30	14:45	69	12	0	0	0	0	8	0	0	0	1	0	0	0	0	2	0	1	4	12	1	4	04:16	11:05	16:45	23:39	3.54	06:30	18:36		92
30/03/2019	ED	CL	1	11:30	11:50	103	38	0	0	8	1	0	0	0	1	1	0	0	0	0	0	0	2	3	12	1	4	07:08	00:38	20:00	13:21	-1.68	06:04	18:55		152
30/03/2019	ED	CL	2	12:30	12:50	101	49	0	0	9	0	2	0	0	0	1	0	0	0	0	0	0	2	3	13	1	4	07:08	00:38	20:00	13:21	-0.68	06:04	18:55		162
30/03/2019	ED	CL	3	13:30	13:50	58	35	0	0	18	0	7	0	0	0	2	0	0	0	0	0	0	2	4	12	1	4	07:08	00:38	20:00	13:21	0.32	06:04	18:55		120
30/03/2019	ED	CL	4	14:30	14:50	36	29	0	0	12	0	11	0	0	0	0	0	0	0	0	0	0	2	4	12	1	4	07:08	00:38	20:00	13:21	1.32	06:04	18:55		88
30/03/2019	ED	CL	5	15:30	15:30	30	33	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	10	1	4	07:08	00:38	20:00	13:21	2.15	06:04	18:55		68
30/03/2019	ED	CL	6	16:30	16:50	91	7	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	9	1	4	07:08	00:38	20:00	13:21	3.32	06:04	18:55		103
30/03/2019	ED	CL	7	17:30	17:50	8	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5	4	9	1	4	07:08	00:38	20:00	13:21	4.32	06:04	18:55		13
30/03/2019	ED	CL	8	18:30	18:45	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	4	8	1	4	07:08	00:38	20:00	13:21	5.28	06:04	18:55	Good no's of birds early on but beach busy during the afternoon	6

Table 2. All Data by Subsite

GENERAL					COUNT INFORMATION									WEATHER					TIDAL CYCLE						
Date	Observer	Count no.	Start time	End time	Species code	1AV	1AX	1BV	1BX	2AV	2AX	2BV	TOTAL	Wind	Cloud	Temp	Precip	Vis	High tide	Low tide	High tide	Low tide	Hours from low tide	Sunrise	Sunset
01/11/2018	DW	1	07:37	08:05	OC	4	0	0	3	0	6	0	**13**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	HG	8	0	16	26	0	56	0	**106**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	H.	0	0	0	0	0	1	0	**1**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	CA	0	0	0	0	1	0	0	**1**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	RK	0	0	0	0	0	1	0	**1**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	HC	0	0	0	0	0	1	0	**1**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	GB	2	0	0	1	0	0	0	**3**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	BH	0	1	0	2	0	0	0	**3**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	1	07:37	08:05	CU	0	0	0	4	0	0	0	**4**	2	1	2	1	4	05:37	10:48	17:46	22:39	-2.95	07:26	16:56
01/11/2018	DW	2	08:37	09:01	HC	0	0	0	2	0	1	0	**3**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	2	08:37	09:01	HG	39	2	0	44	0	74	2	**161**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	2	08:37	09:01	GB	5	0	0	10	0	0	0	**15**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	2	08:37	09:01	OC	8	0	0	8	0	0	0	**16**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	2	08:37	09:01	CU	1	0	0	2	0	0	0	**3**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	2	08:37	09:01	BH	2	1	0	2	0	0	0	**5**	2	1	3	1	4	05:37	10:48	17:46	22:39	-1.98	07:26	16:56
01/11/2018	DW	3	09:37	09:55	GB	2	0	12	0	5	0	1	**20**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	HG	30	0	40	0	13	8	0	**91**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	OC	8	4	0	2	0	1	0	**15**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	CU	2	0	1	0	0	0	0	**3**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	BH	4	0	3	1	0	0	0	**8**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	HC	0	0	3	0	0	0	0	**3**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	RK	1	0	0	0	0	0	0	**1**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	GK	1	0	0	0	0	0	0	**1**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	3	09:37	09:55	H.	1	0	0	0	0	0	0	**1**	2	1	4	1	4	05:37	10:48	17:46	22:39	-1.03	07:26	16:56
01/11/2018	DW	4	10:37	11:08	HG	23	0	52	5	10	31	0	**121**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	4	10:37	11:08	BH	4	0	0	1	0	1	0	**6**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	4	10:37	11:08	OC	18	0	9	0	2	0	0	**29**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	4	10:37	11:08	GB	2	0	7	2	2	0	0	**13**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	4	10:37	11:08	CU	0	0	2	0	1	0	0	**3**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	4	10:37	11:08	RK	0	1	0	0	0	0	0	**1**	2	1	6	1	4	05:37	10:48	17:46	22:39	0.07	07:26	16:56
01/11/2018	DW	5	11:37	12:02	HG	30	2	71	12	35	2	0	**152**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	5	11:37	12:02	OC	2	14	2	0	1	0	0	**19**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	5	11:37	12:02	GB	2	0	5	0	2	0	0	**9**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	5	11:37	12:02	HC	2	0	2	0	0	0	0	**4**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	5	11:37	12:02	CU	2	0	0	0	0	0	0	**2**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	5	11:37	12:02	BH	3	5	0	0	0	0	0	**8**	2	1	7	1	4	05:37	10:48	17:46	22:39	1.03	07:26	16:56
01/11/2018	DW	6	12:37	12:58	HG	17	2	47	18	14	0	0	**98**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	GB	0	0	7	0	1	0	0	**8**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	OC	0	0	0	9	0	0	0	**9**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	CU	1	0	1	0	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	BH	2	1	0	3	0	0	0	**6**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	HC	2	0	0	0	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	6	12:37	12:58	RK	2	0	0	0	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	1.99	07:26	16:56
01/11/2018	DW	7	13:48	14:08	HG	15	0	4	58	1	4	0	**82**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56
01/11/2018	DW	7	13:48	14:08	BH	2	0	0	4	0	1	0	**7**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56

01/11/2018	DW	7	13:48	14:08	OC	0	7	0	5	0	0	0	**12**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56
01/11/2018	DW	7	13:48	14:08	GB	2	0	5	6	0	0	0	**13**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56
01/11/2018	DW	7	13:48	14:08	HC	1	0	0	1	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.17	07:26	16:56
01/11/2018	DW	8	14:39	14:50	GB	0	0	0	0	2	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
01/11/2018	DW	8	14:39	14:50	HG	8	0	0	24	1	2	0	**35**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
01/11/2018	DW	8	14:39	14:50	RK	0	0	0	0	0	1	0	**1**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
01/11/2018	DW	8	14:39	14:50	BH	0	0	0	2	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
01/11/2018	DW	8	14:39	14:50	HC	0	0	0	2	0	0	0	**2**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
01/11/2018	DW	8	14:39	14:50	OC	1	0	0	0	0	0	0	**1**	2	1	8	1	4	05:37	10:48	17:46	22:39	3.94	07:26	16:56
22/11/2018	DW	1	08:57	09:09	HG	0	0	0	0	0	8	0	**8**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	1	08:57	09:09	OC	0	0	0	0	0	13	0	**13**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	1	08:57	09:09	GB	0	0	0	0	0	1	0	**1**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	1	08:57	09:09	RK	0	0	0	0	0	1	0	**1**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	1	08:57	09:09	GK	0	0	0	0	0	3	0	**3**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	1	08:57	09:09	TT	0	0	0	0	0	10	0	**10**	3	3	8	1	3	-	04:02	10:37	16:21	5.02	08:05	16:22
22/11/2018	DW	2	09:50	10:03	OC	0	0	0	0	0	18	0	**18**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	2	09:50	10:03	HG	0	0	0	0	0	5	0	**5**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	2	09:50	10:03	GK	0	0	0	0	0	3	0	**3**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	2	09:50	10:03	RK	0	0	0	0	0	2	0	**2**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	2	09:50	10:03	TT	0	0	0	0	0	10	0	**10**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	2	09:50	10:03	GB	0	0	0	0	0	2	0	**2**	3	3	8	1	3	-	04:02	10:37	16:21	5.91	08:05	16:22
22/11/2018	DW	3	10:57	11:20	BH	0	1	0	0	0	3	0	**4**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	HG	0	0	0	0	0	59	0	**59**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	GK	0	0	0	0	0	3	0	**3**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	GB	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	OC	0	0	0	0	0	10	0	**10**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	HC	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	CA	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	TT	0	0	0	0	0	5	0	**5**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	3	10:57	11:20	RK	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-5.21	08:05	16:22
22/11/2018	DW	4	11:50	12:04	OC	0	0	0	0	0	18	0	**18**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	BH	0	0	0	0	0	7	0	**7**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	RK	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	GK	0	0	0	0	0	2	0	**2**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	TT	0	0	0	0	0	7	0	**7**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	HC	0	0	0	0	0	2	0	**2**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	4	11:50	12:04	HG	0	0	0	0	0	1	0	**1**	3	2	7	1	3	-	04:02	10:37	16:21	-4.40	08:05	16:22
22/11/2018	DW	5	12:51	13:08	HG	0	4	0	15	0	9	0	**28**	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22
22/11/2018	DW	5	12:51	13:08	OC	0	0	0	0	0	3	0	**3**	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22
22/11/2018	DW	5	12:51	13:08	BH	0	0	0	1	0	2	0	**3**	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22
22/11/2018	DW	5	12:51	13:08	RK	0	0	0	0	0	1	0	**1**	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22
22/11/2018	DW	5	12:51	13:08	GB	0	4	0	2	0	0	0	**6**	2	3	7	1	3	-	04:02	10:37	16:21	-3.36	08:05	16:22
22/11/2018	DW	6	13:57	14:30	HG	40	0	75	9	9	6	0	**139**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	RK	0	0	1	0	0	1	0	**2**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	BH	5	0	9	0	0	1	0	**15**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	OC	1	0	9	0	0	1	0	**11**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	GB	7	0	6	1	0	1	0	**15**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	HC	3	0	0	0	0	1	0	**4**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	CU	2	0	2	0	0	0	0	**4**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22
22/11/2018	DW	6	13:57	14:30	H.	1	0	0	0	0	0	0	**1**	2	2	7	1	3	-	04:02	10:37	16:21	-2.13	08:05	16:22

22/11/2018	DW	7	14:56	15:25	OC	2	0	2	0	7	3	0	**14**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	HG	24	2	80	8	27	1	0	**142**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	GB	7	0	13	0	7	0	0	**27**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	CU	0	2	4	0	1	0	0	**7**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	BH	5	4	2	2	0	0	0	**13**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	RK	0	1	0	0	0	0	0	**1**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	7	14:56	15:25	HC	0	1	0	0	0	0	0	**1**	3	3	6	1	3	-	04:02	10:37	16:21	-1.18	08:05	16:22
22/11/2018	DW	8	15:58	16:17	HG	19	0	21	13	32	0	0	**85**	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22
22/11/2018	DW	8	15:58	16:17	GB	6	0	2	2	5	0	0	**15**	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22
22/11/2018	DW	8	15:58	16:17	OC	1	0	0	1	6	0	0	**8**	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22
22/11/2018	DW	8	15:58	16:17	BH	4	6	5	0	6	0	0	**21**	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22
22/11/2018	DW	8	15:58	16:17	CU	0	0	0	0	1	0	0	**1**	3	3	5	1	3	-	04:02	10:37	16:21	-0.23	08:05	16:22
04/12/2018	DW	1	08:14	08:28	OC	0	7	0	0	0	36	0	**43**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	HG	0	0	0	0	0	14	0	**14**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	BH	0	0	0	0	0	2	0	**2**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	GK	0	0	0	0	0	3	0	**3**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	CA	0	0	0	0	0	0	2	**2**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	RC	0	0	0	2	0	0	0	**2**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	1	08:14	08:28	CU	0	2	0	0	0	0	0	**2**	2	1	1	1	3	-	02:42	09:30	15:03	5.65	08:24	16:11
04/12/2018	DW	2	09:15	09:37	HG	0	1	0	0	0	18	0	**19**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	2	09:15	09:37	GB	0	0	0	0	0	3	0	**3**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	2	09:15	09:37	OC	0	0	0	0	0	32	0	**32**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	2	09:15	09:37	GK	0	0	0	0	0	3	0	**3**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	2	09:15	09:37	HC	0	0	0	0	0	1	0	**1**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	2	09:15	09:37	BH	0	0	0	0	0	1	0	**1**	2	2	1	1	3	-	02:42	09:30	15:03	-5.62	08:24	16:11
04/12/2018	DW	3	10:13	10:23	HG	0	0	0	1	0	15	0	**16**	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11
04/12/2018	DW	3	10:13	10:23	GB	0	0	0	0	0	2	0	**2**	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11
04/12/2018	DW	3	10:13	10:23	OC	0	0	0	0	0	25	0	**25**	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11
04/12/2018	DW	3	10:13	10:23	GK	0	0	0	0	0	3	0	**3**	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11
04/12/2018	DW	3	10:13	10:23	BH	0	1	0	0	0	0	0	**1**	2	3	2	1	3	-	02:42	09:30	15:03	-4.75	08:24	16:11
04/12/2018	DW	4	11:13	11:26	OC	0	0	0	0	0	19	0	**19**	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11
04/12/2018	DW	4	11:13	11:26	HG	0	1	0	30	0	7	0	**38**	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11
04/12/2018	DW	4	11:13	11:26	GK	0	0	0	0	0	2	0	**2**	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11
04/12/2018	DW	4	11:13	11:26	BH	0	0	0	3	0	3	0	**6**	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11
04/12/2018	DW	4	11:13	11:26	GB	0	0	0	4	0	1	0	**5**	2	3	4	1	3	-	02:42	09:30	15:03	-3.73	08:24	16:11
04/12/2018	DW	5	12:11	12:31	H.	0	0	0	0	0	1	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	OC	5	0	0	5	0	2	0	**12**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	CA	0	0	0	0	0	1	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	HG	26	0	0	81	0	9	0	**116**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	GB	10	0	0	9	0	0	0	**19**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	BH	0	2	0	8	0	0	0	**10**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	RK	0	0	0	1	0	0	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	CU	3	0	0	0	0	0	0	**3**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	PB	11	0	0	0	0	0	0	**11**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	5	12:11	12:31	ET	0	1	0	0	0	0	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-2.70	08:24	16:11
04/12/2018	DW	6	13:25	13:50	H.	0	0	0	0	0	1	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	HG	12	0	80	21	25	0	3	**141**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	GB	1	0	3	0	2	0	0	**6**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	OC	16	0	0	0	2	0	0	**18**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	HC	0	0	0	0	3	0	0	**3**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11

04/12/2018	DW	6	13:25	13:50	CU	2	0	1	0	0	0	0	**3**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	BH	3	0	4	0	0	0	0	**7**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	PB	2	0	0	0	0	0	0	**2**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	RK	1	0	0	0	0	0	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	6	13:25	13:50	CA	1	0	0	0	0	0	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-1.43	08:24	16:11
04/12/2018	DW	7	14:16	14:38	HG	25	0	14	15	45	0	4	**103**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	OC	9	0	3	0	2	0	2	**16**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	GB	4	0	5	2	5	0	0	**16**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	CU	2	0	0	0	2	0	0	**4**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	BH	1	0	6	6	0	0	0	**13**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	RK	1	0	0	0	0	0	0	**1**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	7	14:16	14:38	PB	2	0	0	0	0	0	0	**2**	2	3	5	1	3	-	02:42	09:30	15:03	-0.60	08:24	16:11
04/12/2018	DW	8	15:12	15:32	HG	15	0	32	11	13	0	17	**88**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	GB	4	0	5	1	3	0	1	**14**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	OC	9	0	0	0	5	0	0	**14**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	BH	5	0	5	3	5	0	0	**18**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	PB	0	0	0	5	0	0	0	**5**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	CU	2	0	0	0	0	0	0	**2**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	H.	1	0	0	0	0	0	0	**1**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
04/12/2018	DW	8	15:12	15:32	RK	0	1	0	0	0	0	0	**1**	2	3	4	1	3	-	02:42	09:30	15:03	0.32	08:24	16:11
19/12/2018	DW	1	09:35	09:50	HG	0	0	0	0	0	59	0	**59**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	OC	0	0	0	0	0	15	0	**15**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	GB	0	0	0	0	0	2	0	**2**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	GK	0	0	0	0	0	5	0	**5**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	BH	0	0	0	0	0	5	0	**5**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	RP	0	0	0	0	0	37	0	**37**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	TT	0	0	0	0	0	4	0	**4**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	1	09:35	09:50	CA	0	0	0	0	0	1	0	**1**	3	1	6	1	4	08:42	14:19	20:55	-	-4.61		
19/12/2018	DW	2	10:35	10:49	HG	0	0	0	0	0	52	0	**52**	4	3	6	1	4	08:42	14:19	20:55	-	-3.62		
19/12/2018	DW	2	10:35	10:49	BH	0	0	0	0	0	5	0	**5**	4	3	6	1	4	08:42	14:19	20:55	-	-3.62		
19/12/2018	DW	2	10:35	10:49	OC	0	5	0	0	0	19	0	**24**	4	3	6	1	4	08:42	14:19	20:55	-	-3.62		
19/12/2018	DW	2	10:35	10:49	RP	0	0	0	0	0	2	0	**2**	4	3	6	1	4	08:42	14:19	20:55	-	-3.62		
19/12/2018	DW	2	10:35	10:49	GK	0	0	0	0	0	1	0	**1**	4	3	6	1	4	08:42	14:19	20:55	-	-3.62		
19/12/2018	DW	3	11:33	11:50	HG	0	0	0	53	0	22	0	**75**	4	2	7	1	4	08:42	14:19	20:55	-	-2.63		
19/12/2018	DW	3	11:33	11:50	GB	0	0	0	12	0	1	0	**13**	4	2	7	1	4	08:42	14:19	20:55	-	-2.63		
19/12/2018	DW	3	11:33	11:50	OC	0	0	0	0	0	7	0	**7**	4	2	7	1	4	08:42	14:19	20:55	-	-2.63		
19/12/2018	DW	3	11:33	11:50	BH	0	0	0	10	0	1	0	**11**	4	2	7	1	4	08:42	14:19	20:55	-	-2.63		
19/12/2018	DW	4	12:33	12:50	HG	5	0	88	72	10	10	0	**185**	3	2	8	1	4	08:42	14:19	20:55	-	-1.63		
19/12/2018	DW	4	12:33	12:50	GB	0	0	12	6	0	1	0	**19**	3	2	8	1	4	08:42	14:19	20:55	-	-1.63		
19/12/2018	DW	4	12:33	12:50	OC	0	0	12	0	0	0	0	**12**	3	2	8	1	4	08:42	14:19	20:55	-	-1.63		
19/12/2018	DW	4	12:33	12:50	BH	0	3	4	6	0	0	0	**13**	3	2	8	1	4	08:42	14:19	20:55	-	-1.63		
19/12/2018	DW	5	13:38	13:59	HG	12	0	67	25	18	0	0	**122**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	5	13:38	13:59	GB	1	0	12	2	4	0	0	**19**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	5	13:38	13:59	CA	0	0	0	0	1	0	0	**1**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	5	13:38	13:59	OC	1	0	1	0	0	0	0	**2**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	5	13:38	13:59	BH	2	0	5	0	0	0	0	**7**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	5	13:38	13:59	CU	1	0	3	8	0	0	0	**12**	4	3	8	1	4	08:42	14:19	20:55	-	-0.51		
19/12/2018	DW	6	14:38	15:00	HG	15	7	28	27	13	0	0	**90**	4	3	8	1	4	08:42	14:19	20:55	-	0.50		
19/12/2018	DW	6	14:38	15:00	CU	1	0	0	0	1	0	0	**2**	4	3	8	1	4	08:42	14:19	20:55	-	0.50		
19/12/2018	DW	6	14:38	15:00	GB	3	4	7	8	2	0	0	**24**	4	3	8	1	4	08:42	14:19	20:55	-	0.50		

19/12/2018	DW	6	14:38	15:00	OC	5	13	5	5	3	0	0	**31**	4	3	8	1	4	08:42	14:19	20:55	-	0.50
19/12/2018	DW	6	14:38	15:00	BH	1	3	0	17	0	0	0	**21**	4	3	8	1	4	08:42	14:19	20:55	-	0.50
19/12/2018	DW	7	15:35	15:50	HG	20	0	10	38	10	0	0	**78**	4	3	8	1	4	08:42	14:19	20:55	-	1.39
19/12/2018	DW	7	15:35	15:50	GB	4	0	3	4	2	0	0	**13**	4	3	8	1	4	08:42	14:19	20:55	-	1.39
19/12/2018	DW	7	15:35	15:50	BH	0	0	0	17	0	0	0	**17**	4	3	8	1	4	08:42	14:19	20:55	-	1.39
19/12/2018	DW	7	15:35	15:50	OC	0	1	0	0	0	0	0	**1**	4	3	8	1	4	08:42	14:19	20:55	-	1.39
19/12/2018	DW	7	15:35	15:50	CU	1	0	0	0	0	0	0	**1**	4	3	8	1	4	08:42	14:19	20:55	-	1.39
11/01/2019	DW	1	08:56	09:38	HG	-	-	418	-	42	0	-	**460**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	CU	-	-	22	-	3	0	0	**25**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	OC	-	-	26	-	2	0	0	**28**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	GB	-	-	93	-	4	0	0	**97**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	BH	-	-	22	-	0	0	0	**22**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	H.	-	-	3	-	0	0	0	**3**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	1	08:56	09:38	PB	-	-	4	-	0	0	0	**4**	2	4	7	1	4	-	08:08	14:50	20:41	1.15
11/01/2019	DW	2	09:55	10:32	HG	-	-	-	-	-	-	-	**587**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	2	09:55	10:32	OC	-	-	-	-	-	-	-	**41**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	2	09:55	10:32	GB	-	-	-	-	-	-	-	**62**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	2	09:55	10:32	CU	-	-	-	-	-	-	-	**8**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	2	09:55	10:32	H.	-	-	-	-	-	-	-	**2**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	2	09:55	10:32	BH	-	-	-	-	-	-	-	**27**	2	4	7	1	4	-	08:08	14:50	20:41	2.09
11/01/2019	DW	3	10:55	11:18	HG	32	0	0	288	5	4	0	**329**	2	4	8	1	4	-	08:08	14:50	20:41	2.98
11/01/2019	DW	3	10:55	11:18	GB	15	0	0	22	2	0	0	**39**	2	4	8	1	4	-	08:08	14:50	20:41	2.98
11/01/2019	DW	3	10:55	11:18	OC	0	0	0	3	1	0	0	**4**	2	4	8	1	4	-	08:08	14:50	20:41	2.98
11/01/2019	DW	3	10:55	11:18	BH	0	0	0	8	0	0	0	**8**	2	4	8	1	4	-	08:08	14:50	20:41	2.98
11/01/2019	DW	3	10:55	11:18	RK	0	0	1	0	0	0	0	**1**	2	4	8	1	4	-	08:08	14:50	20:41	2.98
11/01/2019	DW	4	11:57	12:14	OC	0	0	0	0	0	4	0	**4**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	4	11:57	12:14	RK	0	0	0	0	0	1	0	**1**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	4	11:57	12:14	GK	0	0	0	0	0	1	0	**1**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	4	11:57	12:14	GB	8	0	0	7	0	0	0	**15**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	4	11:57	12:14	BH	0	0	0	0	0	3	0	**3**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	4	11:57	12:14	HG	45	0	0	61	0	0	0	**106**	2	4	8	1	4	-	08:08	14:50	20:41	3.96
11/01/2019	DW	5	12:55	13:09	HG	0	0	0	7	0	3	0	**10**	3	3	9	1	4	-	08:08	14:50	20:41	4.90
11/01/2019	DW	5	12:55	13:09	OC	0	3	0	0	0	0	0	**3**	3	3	9	1	4	-	08:08	14:50	20:41	4.90
11/01/2019	DW	6	13:59	14:07	HG	0	0	0	0	0	6	0	**6**	4	3	9	1	4	-	08:08	14:50	20:41	5.92
11/01/2019	DW	6	13:59	14:07	OC	0	3	0	0	0	1	0	**4**	4	3	9	1	4	-	08:08	14:50	20:41	5.92
11/01/2019	DW	7	14:56	15:05	HG	0	0	0	0	0	5	0	**5**	4	3	9	1	4	-	08:08	14:50	20:41	-5.68
11/01/2019	DW	7	14:56	15:05	GB	0	0	0	0	0	1	0	**1**	4	3	9	1	4	-	08:08	14:50	20:41	-5.68
11/01/2019	DW	7	14:56	15:05	BH	0	0	0	0	0	2	0	**2**	4	3	9	1	4	-	08:08	14:50	20:41	-5.68
11/01/2019	DW	7	14:56	15:05	OC	0	0	0	0	0	1	0	**1**	4	3	9	1	4	-	08:08	14:50	20:41	-5.68
11/01/2019	DW	7	14:56	15:05	RT	0	0	0	0	0	1	0	**1**	4	3	9	1	4	-	08:08	14:50	20:41	-5.68
11/01/2019	DW	8	15:55	16:05	BH	0	0	0	0	0	3	0	**3**	4	3	9	1	4	-	08:08	14:50	20:41	-4.68
11/01/2019	DW	8	15:55	16:05	HG	0	0	0	0	0	9	0	**9**	4	3	9	1	4	-	08:08	14:50	20:41	-4.68
11/01/2019	DW	8	15:55	16:05	OC	0	0	0	0	0	2	0	**2**	4	3	9	1	4	-	08:08	14:50	20:41	-4.68
11/01/2019	DW	8	15:55	16:05	GB	0	0	0	0	0	2	0	**2**	4	3	9	1	4	-	08:08	14:50	20:41	-4.68
16/01/2019	DW	1	09:45	10:06	HG	20	0	116	21	22	14	0	**193**	4	1	6	1	4	-	00:12	06:51	12:38	-2.71
16/01/2019	DW	1	09:45	10:06	LB	0	0	0	0	0	3	0	**3**	4	1	6	1	4	-	00:12	06:51	12:38	-2.71
16/01/2019	DW	1	09:45	10:06	GB	6	0	8	3	3	0	0	**20**	4	1	6	1	4	-	00:12	06:51	12:38	-2.71
16/01/2019	DW	1	09:45	10:06	PB	8	0	19	0	0	0	0	**27**	4	1	6	1	4	-	00:12	06:51	12:38	-2.71
16/01/2019	DW	1	09:45	10:06	OC	0	0	3	0	0	0	0	**3**	4	1	6	1	4	-	00:12	06:51	12:38	-2.71
16/01/2019	DW	2	10:47	11:15	HG	124	0	125	58	48	5	0	**360**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62

16/01/2019	DW	2	10:47	11:15	GB	14	0	16	5	5	0	0	**40**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62
16/01/2019	DW	2	10:47	11:15	CU	6	0	1	1	0	0	0	**8**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62
16/01/2019	DW	2	10:47	11:15	BH	5	0	5	10	0	0	0	**20**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62
16/01/2019	DW	2	10:47	11:15	OC	2	0	3	11	0	0	0	**16**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62
16/01/2019	DW	2	10:47	11:15	PB	0	0	0	2	0	0	0	**2**	4	1	6	1	4	-	00:12	06:51	12:38	-1.62
16/01/2019	DW	3	11:48	12:20	HG	7	0	127	397	16	0	0	**547**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	3	11:48	12:20	GB	0	0	21	35	3	0	0	**59**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	3	11:48	12:20	BH	2	0	9	20	0	0	0	**31**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	3	11:48	12:20	OC	9	0	13	15	0	0	0	**37**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	3	11:48	12:20	CU	1	0	3	8	0	0	0	**12**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	3	11:48	12:20	RK	1	0	0	0	0	0	0	**1**	4	2	7	1	4	-	00:12	06:51	12:38	-0.57
16/01/2019	DW	4	12:50	13:21	HG	550	0	215	190	4	0	0	**959**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	4	12:50	13:21	BH	12	0	12	4	1	0	0	**29**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	4	12:50	13:21	GB	45	0	11	5	0	0	0	**61**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	4	12:50	13:21	PB	2	0	2	0	0	0	0	**4**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	4	12:50	13:21	OC	15	0	0	0	0	0	0	**15**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	4	12:50	13:21	CU	5	0	0	0	0	0	0	**5**	4	3	7	1	4	-	00:12	06:51	12:38	0.46
16/01/2019	DW	5	13:48	14:15	HG	280	0	280	289	19	0	0	**868**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	5	13:48	14:15	BH	22	0	0	2	3	0	0	**27**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	5	13:48	14:15	GB	26	0	15	6	0	0	0	**47**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	5	13:48	14:15	PB	0	0	0	5	0	0	0	**5**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	5	13:48	14:15	OC	11	0	0	0	0	0	0	**11**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	5	13:48	14:15	CU	6	0	0	0	0	0	0	**6**	4	3	7	1	4	-	00:12	06:51	12:38	1.39
16/01/2019	DW	6	14:46	15:11	HG	152	0	0	6	0	43	0	**201**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	6	14:46	15:11	OC	0	0	0	12	0	1	0	**13**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	6	14:46	15:11	RK	0	0	0	0	0	2	0	**2**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	6	14:46	15:11	GB	7	0	0	0	0	3	0	**10**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	6	14:46	15:11	BH	0	0	0	4	0	0	0	**4**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	6	14:46	15:11	CU	0	0	0	6	0	0	0	**6**	4	4	7	3	4	-	00:12	06:51	12:38	2.34
16/01/2019	DW	7	15:50	16:10	BH	0	0	0	5	0	7	0	**12**	3	4	6	4	3	-	00:12	06:51	12:38	3.37
16/01/2019	DW	7	15:50	16:10	HG	40	0	0	10	0	35	0	**85**	3	4	6	4	3	-	00:12	06:51	12:38	3.37
16/01/2019	DW	7	15:50	16:10	OC	0	0	0	0	0	10	0	**10**	3	4	6	4	3	-	00:12	06:51	12:38	3.37
16/01/2019	DW	7	15:50	16:10	RK	0	0	0	2	0	0	0	**2**	3	4	6	4	3	-	00:12	06:51	12:38	3.37
16/01/2019	DW	7	15:50	16:10	GB	0	0	0	0	0	2	0	**2**	3	4	6	4	3	-	00:12	06:51	12:38	3.37
16/01/2019	DW	7	15:50	16:10	CU	0	0	0	0	0	4	0	**4**	3	4	6	4	3	-	00:12	06:51	12:38	3.37

Appendix III. Qualifying Interest Wintering Bird Species Flight-line Survey Results

Techrete - Wintering Bird Surveys 2018 - 2019

KEY

HOURS FROM LOW TIDE	
-2.5	two and a half hours before low tide (EBBING TIDE)
2.5	two and a half hours after low tide (RISING TIDE)

SITE	
CL	Claremont Strand
DP	Deer Park Golf

HEIGHT CODES		M
1	BELOW HEIGHT OF SB1	<12
2	AT HEIGHT OF SB1	12
3	AT HEIGHT OF SB2	20
4	1.5X SB2	30
5	2X SB2	40
6	3X SB2	60
7	4X SB2	80
8	>4 SB2	>80

CODE	SPECIES	PEAK COUNT	1% NATIONAL	1% INTERNATIONAL
HG	HERRING GULL	959	-	10200
GB	G. BLACK B. GUL	97	-	4200
BH	BLACK HEADED (	31	-	20000
CM	COMMON GULL	8	-	16400
OC	OYSTERCATCHEI	43	690	8200
CU	CURLEW	47	350	8400
PB	BRENT GOOSE	27	360	400
RK	REDSHANK	2	300	3900
GK	GREENSHANK	5	20	2300
ET	LITTLE EGRET	1	20	1300
H.	HERON	3	25	2700
RP	RINGED PLOVER	75	100	730
CA	CORMORANT	2	120	1200
TT	TURNSTONE	13	95	1400
DN	DUNLIN	14	570	13300
RC	ROCK PIPIT			

Table 1. Flightline Surveys (No Gulls)

GENERAL					SPECIFIC				WEATHER					TIDAL CYCLE								
Date	Observer	Count no.	Start time	End time	Species	No. of Birds	Est. duration over site	Est. average height (m) over site	Wind	Cloud	Temp	Precip	Vis	High tide	Low tide	High tide	Low tide	Hours from low tide	Sunrise	Sunset	Hrs from sunrise	
01/11/2018	DW	1	08:11	08:31	n/a	0	-	-	2	1	2	1	4						07:23	16:53	0.97	day
01/11/2018	DW	2	09:08	09:28	n/a	0	-	-	2	1	3	1	4						07:23	16:53	1.92	day
01/11/2018	DW	3	11:13	11:33	n/a	0	-	-	3	1	6	1	4						07:23	16:53	4.00	day
01/11/2018	DW	4	12:12	12:32	n/a	0	-	-	3	1	7	1	4						07:23	16:53	4.98	day
01/11/2018	DW	5	14:15	14:35	CU	1	0-5	30	4	1	8	1	4						07:23	16:53	7.03	day
22/11/2018	DW	1	09:15	09:35	n/a	0	-	-	3	3	8	1	3						08:02	16:19	1.38	day
22/11/2018	DW	2	10:10	10:30	n/a	0	-	-	3	3	8	1	3						08:02	16:19	2.30	day
22/11/2018	DW	3	11:25	11:45	n/a	0	-	-	3	2	8	1	3						08:02	16:19	3.55	day
22/11/2018	DW	4	12:27	12:47	n/a	0	-	-	2	3	7	1	3						08:02	16:19	4.58	day
22/11/2018	DW	5	14:34	14:54	n/a	0	-	-	3	3	6	1	3						08:02	16:19	6.70	day
22/11/2018	DW	6	16:23	16:43	n/a	0	-	-	3	3	5	1	3						08:02	16:19	8.52	dusk
04/12/2018	DW	1	08:34	08:54	n/a	0	-	-	2	1	1	1	3						08:21	16:08	0.38	dawn
04/12/2018	DW	2	14:44	15:04	CU	7	0-5	80	2	4	5	1	3						08:21	16:08	6.55	day
19/12/2018	DW	1	12:08	12:28	n/a	0	-	-	3	2	8	1	4						08:36	16:07	3.70	day
19/12/2018	DW	2	14:05	14:25	n/a	0	-	-	4	3	8	1	4						08:36	16:07	5.65	day
19/12/2018	DW	3	15:08	15:28	n/a	0	-	-	4	3	8	1	4						08:36	16:07	6.70	day
19/12/2018	DW	4	16:02	16:22	CU	26	0-5	80	4	3	8	1	4						08:36	16:07	7.60	dusk
19/12/2018	DW	4	16:02	16:22	CU	14	0-5	80	4	3	8	1	4						08:36	16:07	7.60	dusk
19/12/2018	DW	4	16:02	16:22	CU	9	0-5	80	4	3	8	1	4						08:36	16:07	7.60	dusk
11/01/2019	DW	1	08:35	08:55	n/a	0	-	-	2	4	7	1	4						08:35	16:30	0.17	dawn
16/01/2019	DW	1	16:15	16:35	n/a	0	-	-	3	4	6	4	3						08:31	16:38	7.90	dusk
16/01/2019	DW	2	16:36	16:56	n/a	0	-	-	4	4	6	3	3						08:31	16:38	8.25	dusk
24/01/2019	DW	1	08:23	08:43	n/a	0	-	-	3	4	5	3	3						08:22	16:52	0.18	dawn
30/01/2019	DW	1	16:45	17:05	CU	1	0-5	60	3	1	2	1	4						08:13	17:03	8.70	dusk
30/01/2019	DW	1	16:45	17:05	CU	3	0-5	60	3	1	2	1	4						08:13	17:03	8.70	dusk
30/01/2019	DW	1	16:45	17:05	CU	41	0-5	60	3	1	2	1	4						08:13	17:03	8.70	dusk
30/01/2019	DW	1	16:45	17:05	CU	9	0-5	40	3	1	2	1	4						08:13	17:03	8.70	dusk
30/01/2019	DW	2	17:06	17:26	OC	9	0-5	30	3	1	2	1	4						08:13	17:03	9.05	dusk
06/02/2019	DW	1	07:55	08:15	CA	3	5-10	40	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	CU	13	0-5	40	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	CU	7	5-10	30	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	H.	1	5-10	40	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	CU	4	0-5	30	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	H.	1	0-5	20	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	CU	1	0-5	30	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	1	07:55	08:15	OC	3	5-10	30	4	2	5	1	3						08:01	17:17	0.07	dawn
06/02/2019	DW	2	08:16	08:36	H.	1	0-5	20	3	2	5	1	4						08:01	17:17	0.42	dawn
14/02/2019	DW	1	16:41	17:01	H.	3	5-10	30	6	2	11	1	4						07:46	17:33	9.08	day
14/02/2019	DW	2	17:16	17:36	n/a	0	-	-	6	3	10	1	4						07:46	17:33	9.67	dusk
14/02/2019	DW	3	17:37	17:57	n/a	0	-	-	6	3	9	1	3						07:46	17:33	10.02	dusk
21/02/2019	DW	1	07:20	07:40	CU	1	0-5	40	3	2	11	1	3						07:31	17:46	-0.02	dawn
21/02/2019	DW	1	07:20	07:40	OC	2	0-5	40	3	2	11	1	3						07:31	17:46	-0.02	dawn
21/02/2019	DW	1	07:20	07:40	H.	1	0-5	30	3	2	11	1	3						07:31	17:46	-0.02	dawn
21/02/2019	DW	2	07:40	08:01	OC	1	5-10	60	3	2	11	1	4						07:31	17:46	0.33	dawn
28/02/2019	DW	1	12:05	12:25	H.	1	0-5	20	3	4	8	1	2						07:15	18:00	5.00	day
28/02/2019	DW	2	17:40	18:00	H.	1	0-5	30	4	4	9	4	3						07:15	18:00	10.58	dusk
28/02/2019	DW	3	18:01	18:21	n/a	0	-	-	4	4	8	4	3						07:15	18:00	10.93	dusk
05/03/2019	DW	1	07:05	07:25	CU	1	10-15	40	5	2	5	1	3						07:04	18:09	0.18	dawn
13/03/2019	DW	1	18:08	18:29	n/a	0	-	-	5	4	8	3	4						06:45	18:24	11.56	dusk
13/03/2019	DW	2	18:08	18:29	n/a	0	-	-	5	4	8	3	4						06:45	18:24	11.56	dusk
20/03/2019	ME	1	06:50	07:20	n/a	0	-	-	1	4	9	1	4						06:30	18.36	0.58	dawn

Appendix IV - Irish Water Confirmation of Feasibility Letter and Statement of Design Acceptance for Foul Sewer Design of the Proposed Development

Confirmation of Feasibility Letter

Marlet Property Group c/o Vincent Barrett
Barrett Mahony, 52-54 Sandwith St Lower, Dublin 2
D02WR26

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

04 February 2019

Dear Sir/Madam,

Re: Customer Reference No 7287699079 pre-connection enquiry - Subject to contract | Contract denied
[Connection for 570 no. domestic and 5 no. retail units]

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at Project Pier, Former Techcrete Site, Howth Road, Dublin. Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

In the case of wastewater connections this assessment does not confirm that a gravity connection is achievable. Therefore a suitably sized pumping station may be required to be installed on your site. All infrastructure should be designed and installed in accordance with the Irish Water Code of Practice.

Water:
New connection is feasible subject to following:
1. A new 300mm trunk main between the North Fringe Water Supply pipeline and Corr Bridge PS to be constructed and in function. The works will be funded by Irish Water. The construction will start in Q" 2019 with estimated completion date in Q4 2020 (subject to change)
2. DMA reconfiguration is required including:
   a) a new cross connection upstream of Corr Bridge PS between the new trunk main and existing 9'' pipe.
   b) New pressure reducing valve and DMA meter downstream of the new cross connection in the 9'' pipe
3. 220m of existing 100 mm uPVC in Howth Road to be upgraded to 150mm NB
4. The Development to be supplied by 160mm PVC main in Howth Road.

Note: prior to connection application the Developer is required to have entered into a Project Works Services Agreement to deliver infrastructure upgrades to facilitate the connection of the development to Irish Water infrastructure.

Wastewater:
Proposed connection to the existing network is feasible without network upgrade.
There are 1500mm and 1200mm concrete sewers within the site boundaries. The Developer will be required to survey the site to determine the exact location of the infrastructure. Any trial investigations shall be carried out with the agreement and in the presence of Fingal County Council Inspector. You are advised that structures or works over or in close proximity to IW infrastructure that will inhibit access for maintenance or endanger structural or functional integrity of the infrastructure are not allowed. A wayleave in favour of Irish Water will be required over the Infrastructure.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and wastewater infrastructure should be submitted to Irish Water for assessment.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at **www.water.ie/connections**. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.

If you have any further questions, please contact Marina Byrne from the design team on 018925991 or email mzbyrne@water.ie. For further information, visit **www.water.ie/connections**

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

Statement of Design Acceptance

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Marlet Property Group
c/o Vincent Barrett
Barrett Mahony,
52-54 Sandwith St Lower,
Dublin 2
D02 WR26

3 October 2019

Re: Design Submission for connections at Project Pier, Former Techcrete Site, Howth Road, Dublin (the "Development") (the "Design Submission") / Connection Reference No: 7287699079

Dear Vincent Barrett,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:

Name: Donal O'Dwyer
Phone: (022) 54606
Email: dodwyer@water.ie

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

Appendix A

Document Title & Revision

- [18386_PPT-BMD-XX-ZZ-DR-C-1002 Rev. P6 Foul & Surface Water Layout]
- [18386_PPT-BMD-XX-ZZ-DR-C-1005 Rev. P6 Watermain Layout]
- [18386_PPT-BMD-XX-ZZ-DR-C-1015 Rev. P4 Foul Water Longitudinal Sections]
- [18386_PPT-BMD-XX-ZZ-DR-C-1200 Rev. PL4 Standard Drainage Detials]
- [18389_PPT-BMD-XX-ZZ-DR-C-1220 Rev. PL4 Watermain Details]

Standard Details/Code of Practice Exemption:
<N/A>

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.