Appendix A10.1 Estuarine Ornithological Surveys

Greater Dublin Drainage

EIAR Chapter 10: Biodiversity (Marine Ornithology)

Appendix A10.1

Estuarine, Coastal and Marine Ornithology Technical Report

May 2018

Project Number: SEC7909

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This report has been prepared within the RPS Planning and Development Quality Management System to British Standard EN ISO 9001 : 2008

CONTENTS

1. INTRODUCTION

1.1 Purpose of this Document

This document outlines the protocols for surveys and presents the ornithology data collected for the Greater Dublin Drainage (GDD) Project on estuarine, coastal and marine ornithology. It should be read in conjunction with the relevant Environmental Impact Assessment Report (EIAR) chapter (Chapter 10: Marine Ornithology).

The following surveys are covered by this document:

- Coastal and Marine VP (Velvet Strand; VP1);
- Coastal and Marine VP (Ireland's Eye; VP2); and
- Estuarine bird surveys (Baldoyle Bay).

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Data collected between December 2014 and March 2018 is included.

2. ESTUARINE BIRD SURVEYS

2.1 Survey Methodology

2.1.1 Introduction

Estuarine walkover surveys were carried out based on the standard Wetland Bird Survey methods (Gilbert *et al*., 1998; BTO 2016a and 2016b), using a more refined methodology involving the recording of precise locations of birds as well as their behaviour. Surveys aimed to count, map and record behaviour of wildfowl and waders using the estuarine habitat, in addition to other species of bird present.

2.1.2 Survey Location

The survey area is shown in Figure 10.1 of the EIAR chapter. The survey area covered the route of the pipeline to the outfall where it crosses intertidal/ estuarine habitat, and extended up to 1km from this route across the Baldoyle Bay SPA and surrounding habitats. The size of the survey area was approximately 4.95km².

2.1.3 Target Species

The key species groups were wildfowl, waders and seabirds. However, during the surveys all birds were recorded. Priority was given to recording birds on the ground or on water within the survey area. Records of notable flying birds were made, for example raptors or flocks of waterfowl and waders.

2.1.4 Survey Timing and Effort

In each month, two estuarine survey counts were completed. Each survey was of six hours duration. If the survey area was covered before the allotted time has elapsed (which was possible at high tide), the remaining time was used to undertake repeat counts of any wader or wildfowl hotspots.

Timings of counts throughout the survey period were made so that the whole tidal cycle was equally covered. Counts were made during full daylight.

2.1.5 Field Recording

Species were recorded using standard BTO codes and the behaviour codes specified on the survey map. Information on the age and sex of target species was also desirable. Notable observations that occurred outside the study area but within sight of the surveyors inside the study area were recorded.

2.2 Results

2.2.1 Survey Effort

Survey effort during the estuarine walkover surveys is presented in Appendix 1 (Table A10.1).

2.2.2 Peak Counts

Peak counts from estuarine walkover surveys are presented in Appendix 2 (Tables A10.2 to A10.4).

2.2.3 Figures

The distribution of 53 species encountered during the estuarine walkover surveys is presented in Figures TA10.1 to TA10.53. A figure was produced for species that were named on citations of the Baldoyle Bay, Ireland's Eye or Howth Head Coast SPA, or if more than ten records of the species were made during the surveys.

3. COASTAL AND MARINE VANTAGE POINT (VP) SURVEYS

3.1 Survey Methodology

3.1.1 Introduction

VP surveys were carried out based on those undertaken for the MeyGen Tidal Energy Project in the Pentland Firth (RPS, 2013). They were carried out from December 2014, with six hours of survey carried out monthly per VP to March 2018.

Survey protocol was designed to count birds on the water (primary focus) and in flight (through snapshot recording).

3.1.2 Survey Locations

One location on the mainland and one location on Ireland's Eye were used. The mainland coastal VP was positioned as in previous surveys at the proposed landfall location at Portmarnock (IO250423, Lat. 53.41631, Long. -6.11966, mean viewing angle 70°). The Ireland's Eye VP was positioned at IO287415 (Lat. 53.40792, Long. -6.06387, mean viewing angle 0°).

The mainland coastal VP covered the area of the marine outfall out to sea using a 2km viewing arc; and the Ireland's Eye VP covered the remaining pipeline route using a 2km viewing arc. In this way, a buffer around the marine outfall pipeline footprint and working area was achieved.

3.1.3 Target Species

Key species/ species groups are as listed below. These are primarily seabirds which utilise the marine environment for breeding, foraging or roosting. All species listed were covered, but species marked in bold were considered priority.

- Seaducks
- Divers
- Grebes
- **Fulmar** and other tubenoses (petrels, shearwaters)
- Gannet
- **Cormorant**
- **Shag**
- Skuas
- **Lesser black-backed gull**
- **Herring gull**
- Other large gulls
- **Kittiwake**
- Other small gulls (e.g. black-headed gull, common gull)
- **Roseate tern**
- **Common tern**
- **Arctic tern**
- **Auks**

3.1.4 Survey Timings

From each VP, six hours of survey were undertaken each month, timed to give coverage over a range of tide states, whilst ensuring a spread between neap and spring tides. Surveys commenced and ended no earlier than half an hour before sunrise and or no later than half an hour after sunset. Each VP survey was three hours long, and a minimum of 30 minutes taken as a break between surveys.

3.1.5 Field Recording

The 2km 180° viewing arc was divided into 6 (30°) sections labelled A-F. Each section was subdivided into 500m distance bands (numbered sequentially 1 to 4 away from observer). Each section was identified using land features, rangefinders, and by measuring the compass bearing from the observer.

A full binocular/telescope (dependent on distance band) scan of the whole area was made every 10 minutes, the surveyor working sequentially through the grid and distance bands and recording all birds observed on the water. Only birds on the sea surface, or birds in flight but using the sea (e.g. plunge diving or surface feeding, or clearly observing the sea surface in preparation to do so, or even, if not feeding, regularly dropping to the sea surface) were recorded during this scan; flying birds were ignored. The location of each record was determined using bearings, angles of declination or with reference to static easily identifiable objects in the sea. Standardised protocols for dealing with recording of behaviours and associations were used.

At the end of each full scan, birds in flight were counted in each sector. To reduce/ eliminate double counting this should be as near an instantaneous count as possible.

Throughout a day's observations, environmental conditions were recorded at hourly intervals using standard recording forms.

The following behaviour codes were used to describe birds on the water:

- SU: Surface feeding;
- PL: Plunge feeding;
- DP: Dip feeding;
- FE: Feeding (other);
- SC: Scavenging;
- SF: Scavenging at fishing vessel;
- KL: Kleptoparasitising;
- CN: Carrying nest material;
- CF: Carrying food;
- PR: Preening or bathing;
- ED: Escape diving from vessel;
- EF: Escape flight from vessel;
- RO: Roosting on water;
- LO: Loafing.

3.2 Results

3.2.1 Survey Effort

Survey effort during the Coastal and Marine VP surveys is presented in Appendix 3.

3.2.2 VP Peak Counts

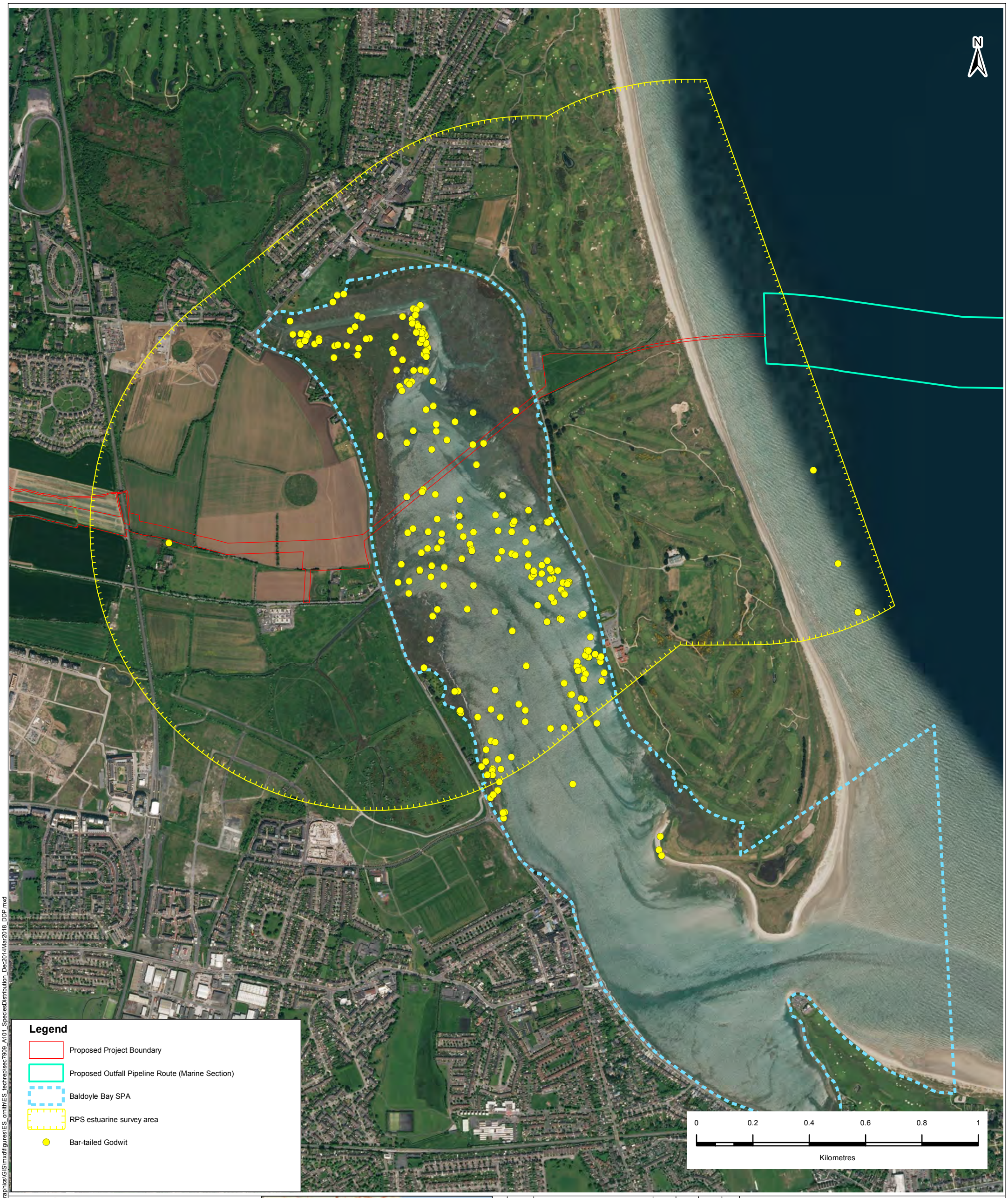
Peak counts from Coastal and Marine VP surveys are presented in Appendix 4. Presented are tables which show the species recorded during both the breeding (April to August) and

passage/winter (September to March) seasons, the total number of times they were recorded during surveys (split by in flight or on sea), and the peak count of birds that were recorded during a single scan (split by in flight or on sea, and combined). Species have been split into tables based on SPA citation (i.e. Ireland's Eye/Howth Head Coast SPA, Baldoyle Bay SPA, and non-cited species).

4. REFERENCES

- BTO (2016a). WeBS Core Counts Method. Available at: http://www.bto.org/volunteer-surveys/webs/taking-part/core-counts-methods.
- BTO (2016b). WeBS Low Tide Counts Method. Available at: http://www.bto.org/volunteer-surveys/webs/taking-part/low-tide-counts.
- Gilbert G., Gibbons D.W. & Evans, J. (1998) Bird Monitoring Methods: A Manual of Techniques for Key UK Species. RSPB, Sandy.
- RPS (2013). MeyGen Tidal Energy Project Inner Sound, Pentland Firth Ornithological Technical Report.

FIGURES



Greater Dublin Drainage

Project
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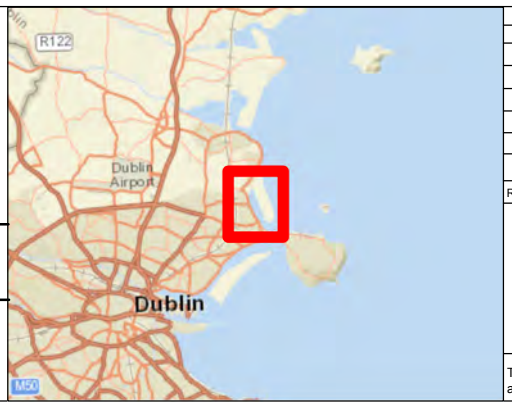
Drawing Title
Figure A10.1 Bar-tailed Godwit Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Brent Goose (light-bellied)

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Kilometres

Greater Dublin Drainage

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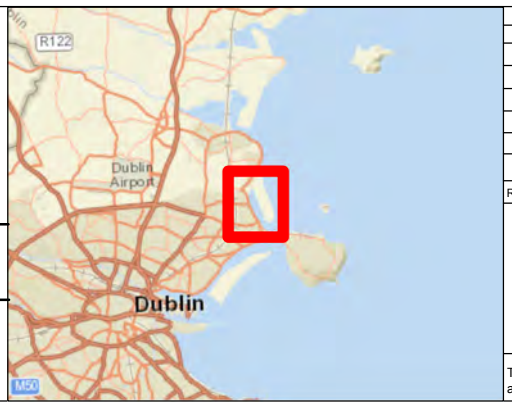
Greater Dublin Drainage Project

Drawing Title

Figure A10.2 Brent Goose (LB) Records in Baldoyle Bay (Dec 2014 to March 2018)



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- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Golden Plover

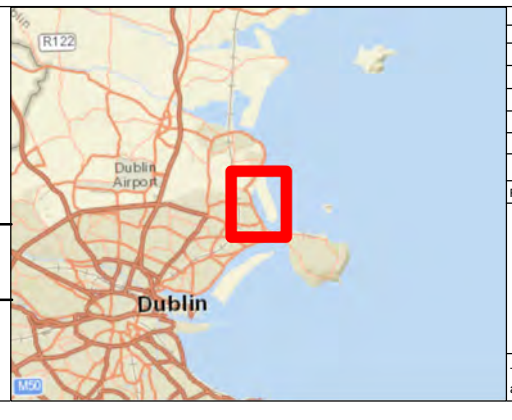

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Figure A10.3 Golden Plover Records in Baldoyle Bay (Dec 2014 to March 2018)

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- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Grey Plover

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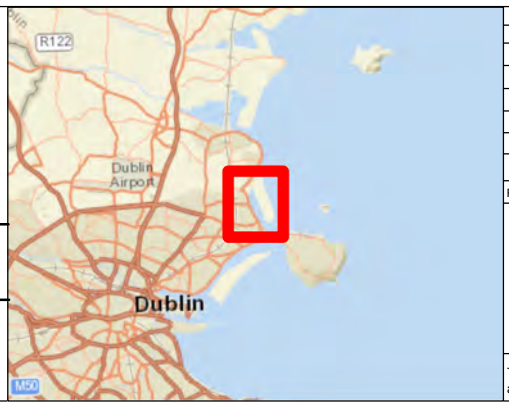
Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.4 Grey Plover Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Ringed Plover

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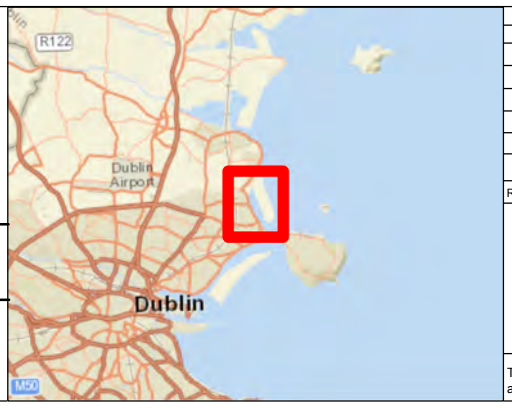
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.5 Ringed Plover Records in Baldoyle Bay (Dec 2014 to March 2018)



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- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Shelduck

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Kilometres

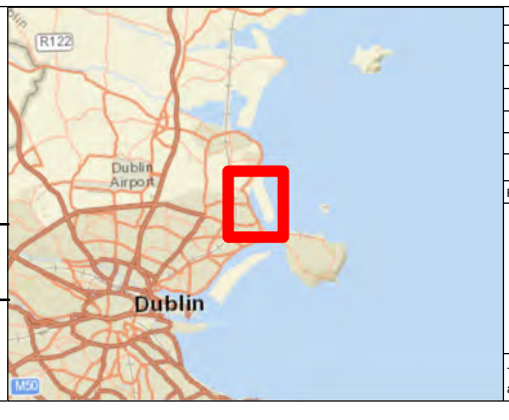
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.6 Shelduck Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Black-tailed Godwit

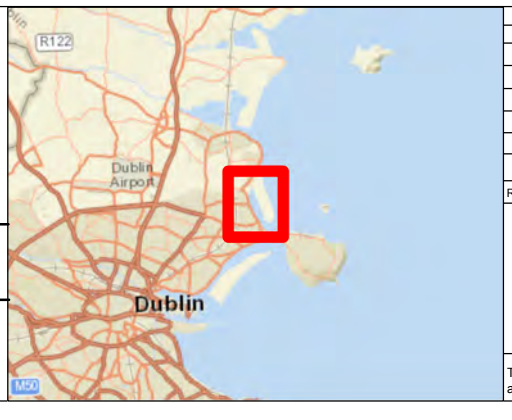
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.7 Black-tailed Godwit Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Curlew

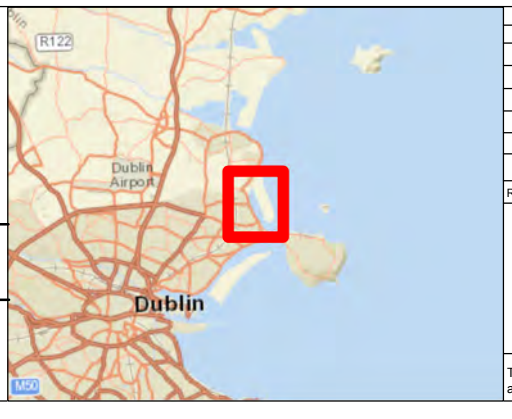
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.8 Curlew Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Dunlin

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Kilometres

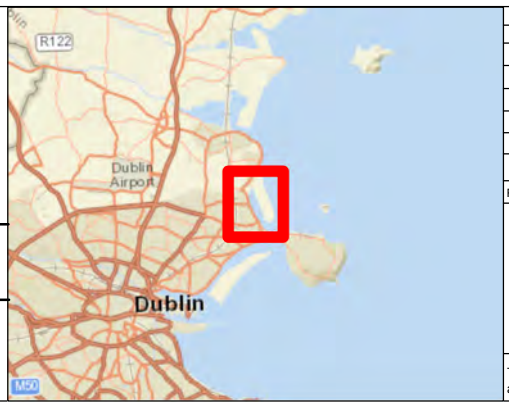
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.9 Dunlin Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Great Crested Grebe

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Kilometres

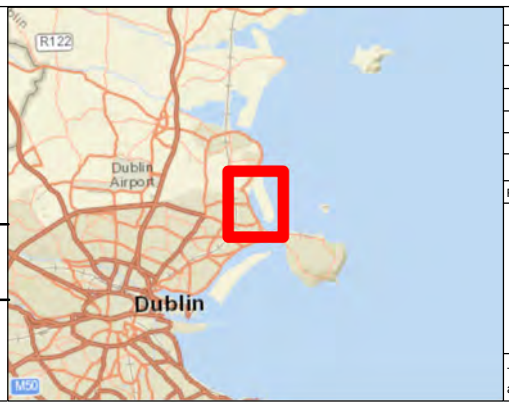
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.10 Great Crested Grebe Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Greenshank

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Kilometres

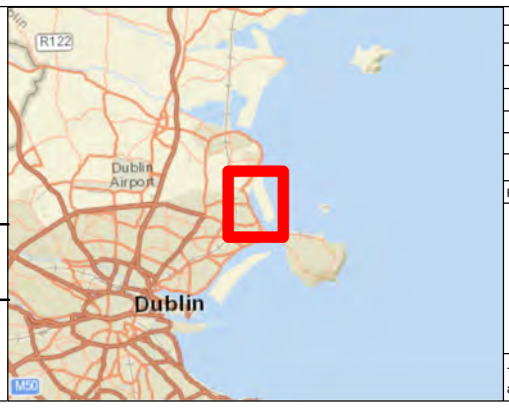
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.11 Greenshank Records in Baldoyle Bay (Dec 2014 to March 2018)



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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Grey Heron

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Kilometres

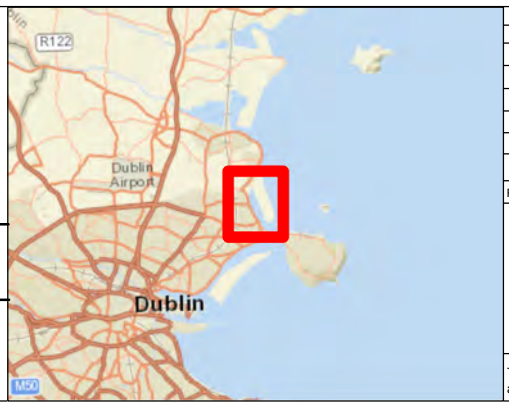
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.12 Grey Heron Records in Baldoyle Bay (Dec 2014 to March 2018)



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0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Knot

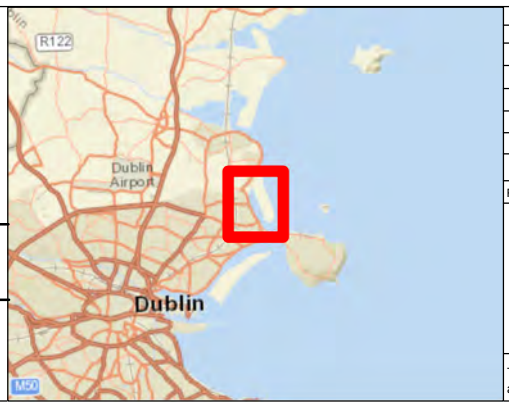
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.13 Knot Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1013

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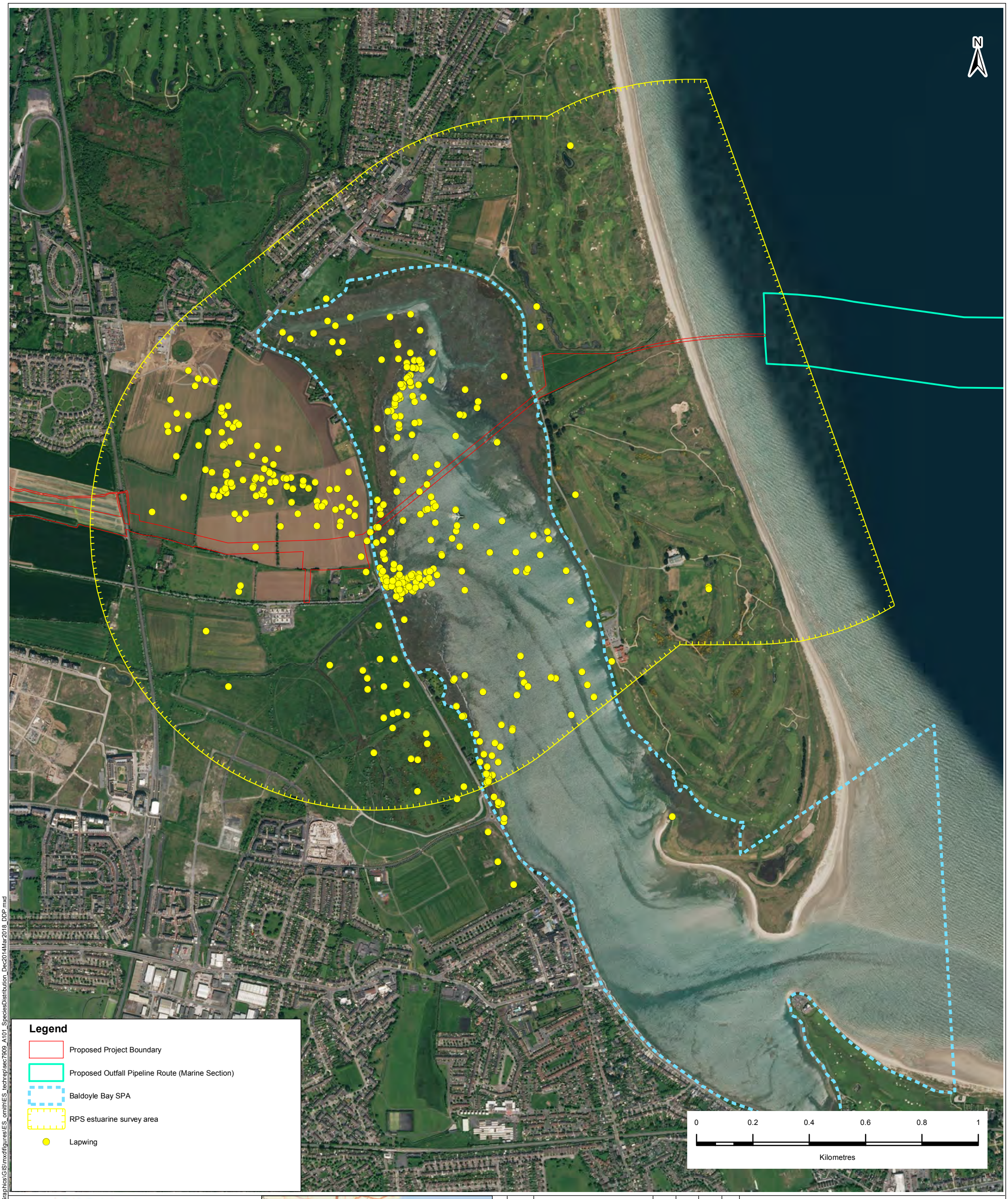

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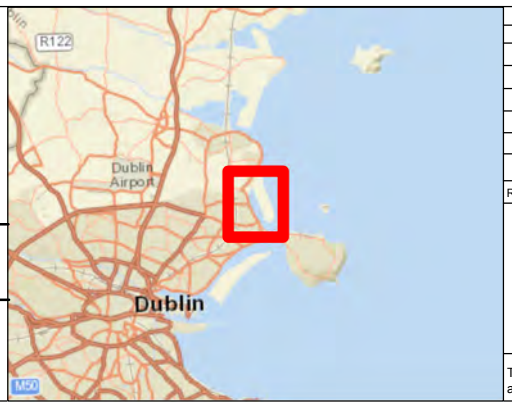
Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.14 Lapwing Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1014

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Mallard

0 0.2 0.4 0.6 0.8 1

Kilometres

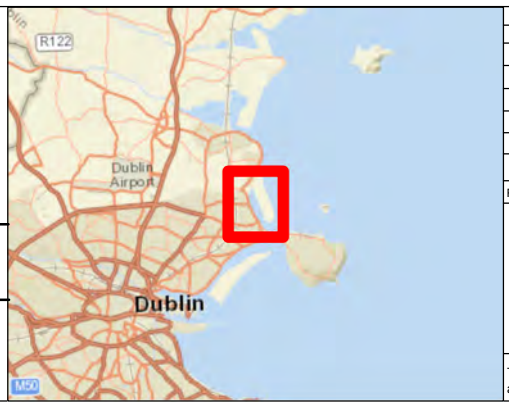
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.15 Mallard Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1015

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Oystercatcher

0 0.2 0.4 0.6 0.8 1

Kilometres

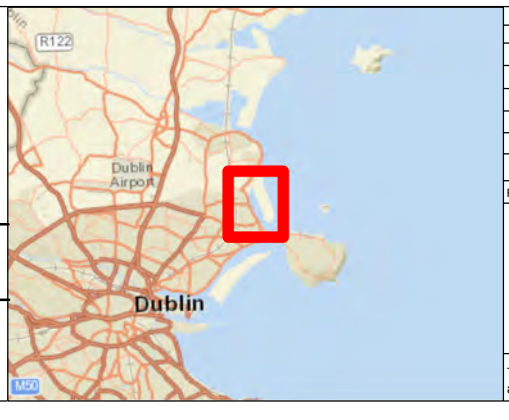
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.16 Oystercatcher Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1016

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Pintail

0 0.2 0.4 0.6 0.8 1

Kilometres

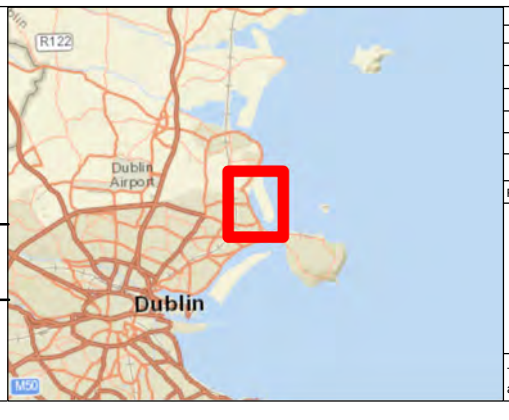
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.17 Pintail Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1017

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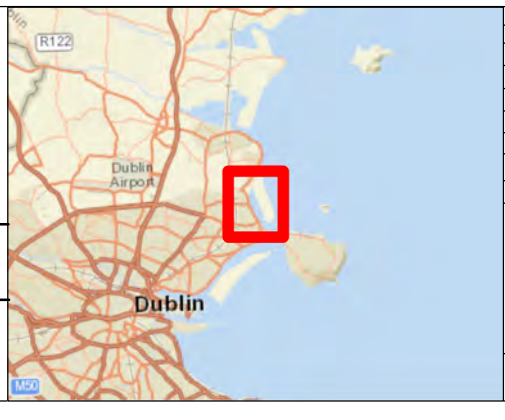
0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Red-breasted Merganser



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0	17/10/17	Draft	CH	RI	KAG	RI

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Project
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Drawing Title
Figure A10.18 Red-breasted Merganser Records in Baldoyle Bay (Dec 2014 to March 2018)

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1018

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Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Redshank

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.19 Redshank Records in Baldoyle Bay (Dec 2014 to March 2018)

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1019

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Sanderling

0 0.2 0.4 0.6 0.8 1

Kilometres

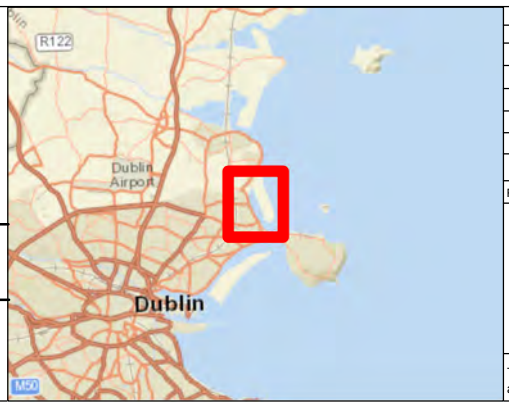
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.20 Sanderling Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1020

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Teal

0 0.2 0.4 0.6 0.8 1

Kilometres

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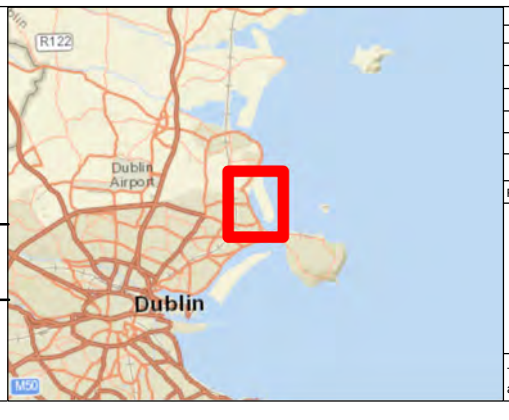
Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.21 Teal Records in Baldoyle Bay (Dec 2014 to March 2018)



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0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1021

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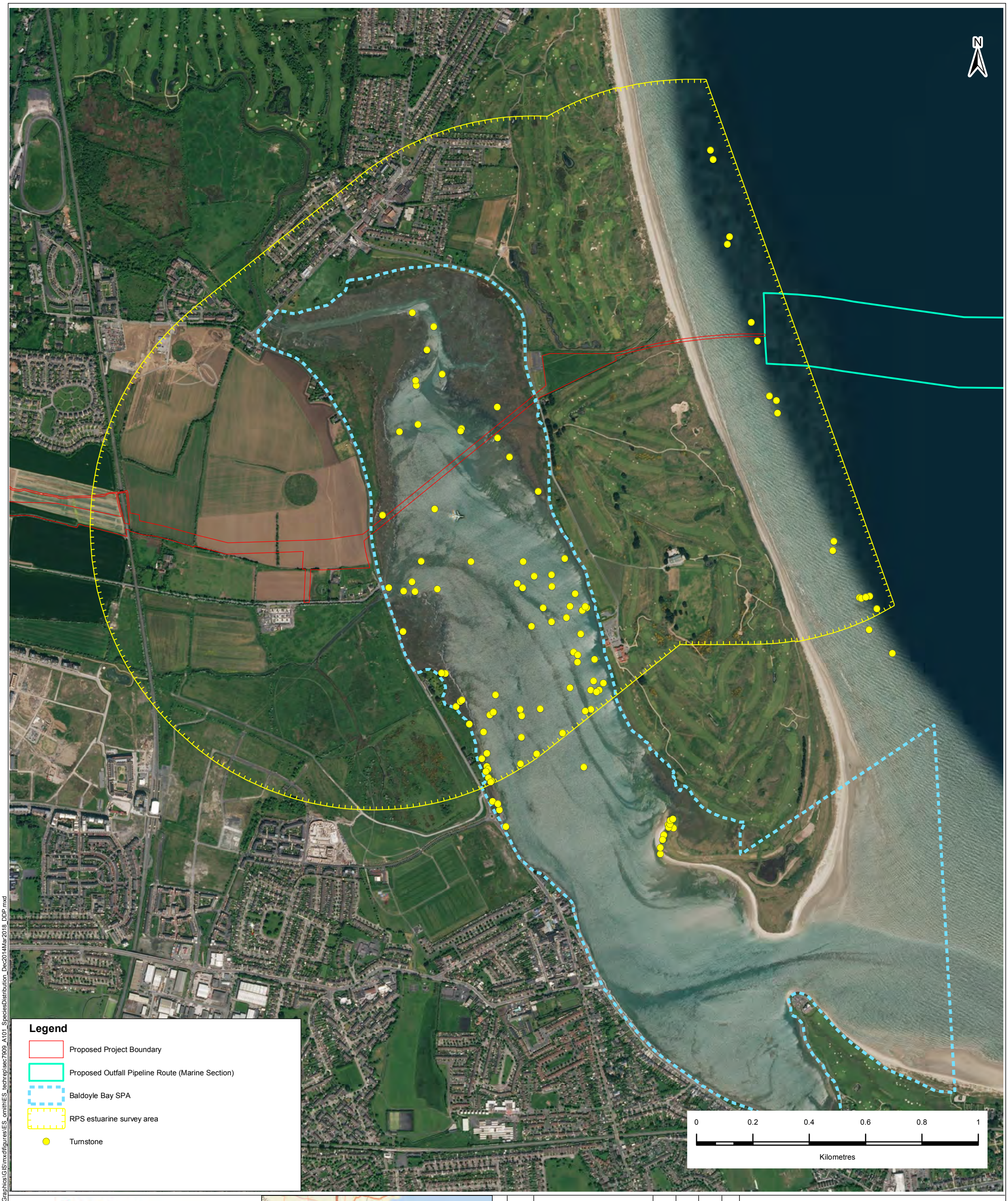

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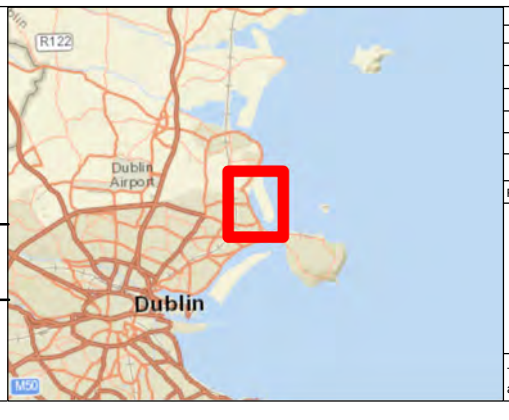
Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.22 Turnstone Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1022

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0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Black Guillemot

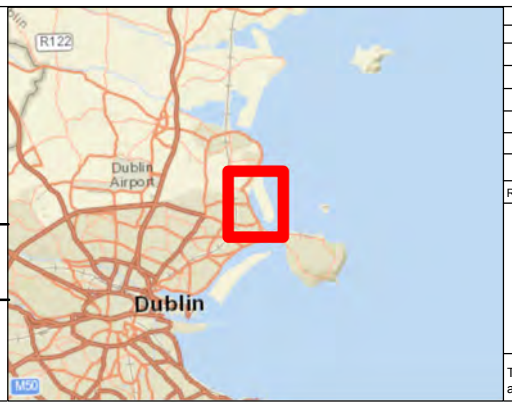
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.23 Black Guillemot Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1023

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Guillemot

0 0.2 0.4 0.6 0.8 1

Kilometres

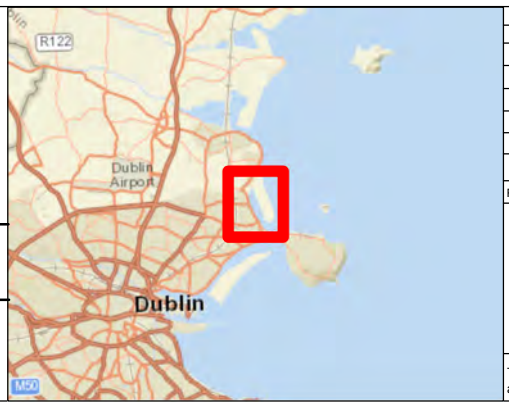
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.24 Guillemot Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Razorbill

0 0.2 0.4 0.6 0.8 1

Kilometres

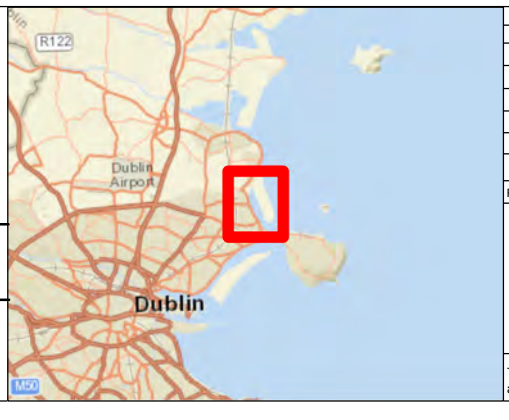
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.25 Razorbill Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1025

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Great Northern Diver

0 0.2 0.4 0.6 0.8 1

Kilometres

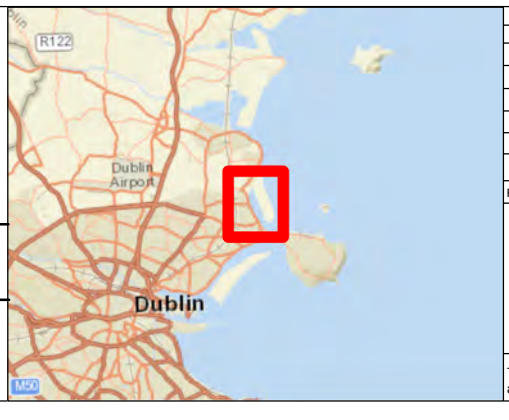
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.26 Great Northern Diver Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1026

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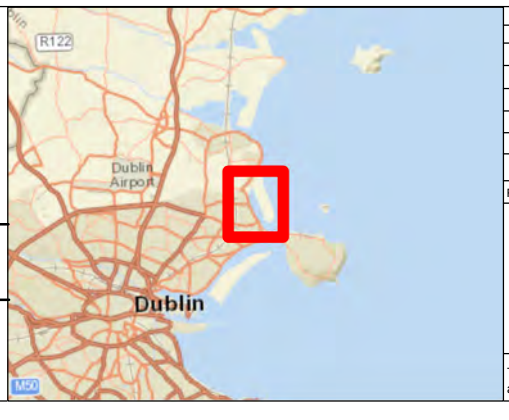
0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Red-throated Diver



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TOBIN

Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.27 Red-throated Diver Records in Baldoyle Bay (Dec 2014 to March 2018)

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1027

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Mute Swan

0 0.2 0.4 0.6 0.8 1

Kilometres

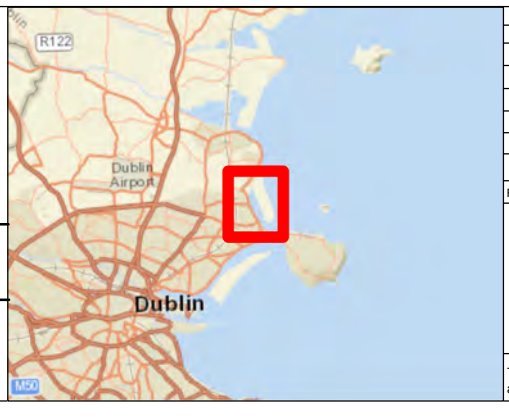
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.28 Mute Swan Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Common Scoter

0 0.2 0.4 0.6 0.8 1

Kilometres

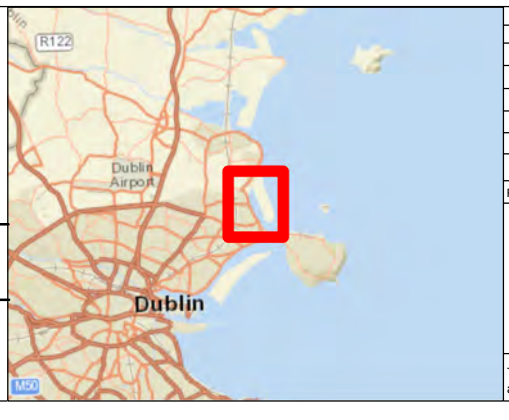
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.29 Common Scoter Records in Baldoyle Bay (Dec 2014 to March 2018)



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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Coot

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Kilometres

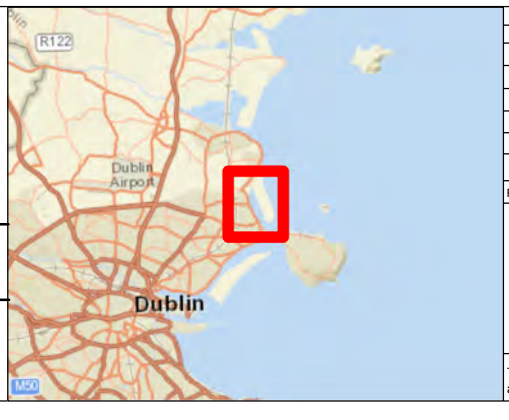
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.30 Coot Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1030

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Little Grebe

0 0.2 0.4 0.6 0.8 1

Kilometres

Greater Dublin Drainage

Project

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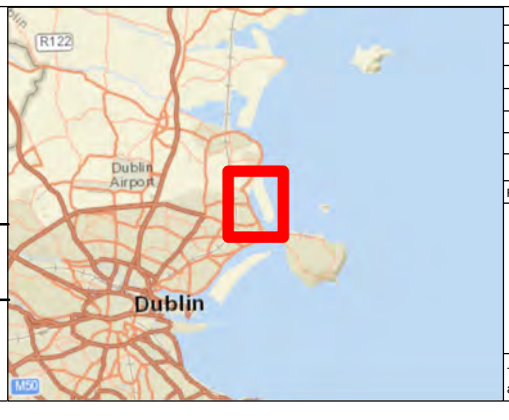
Drawing Title

Figure A10.31 Little Grebe Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1031

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Moorhen

0 0.2 0.4 0.6 0.8 1

Kilometres

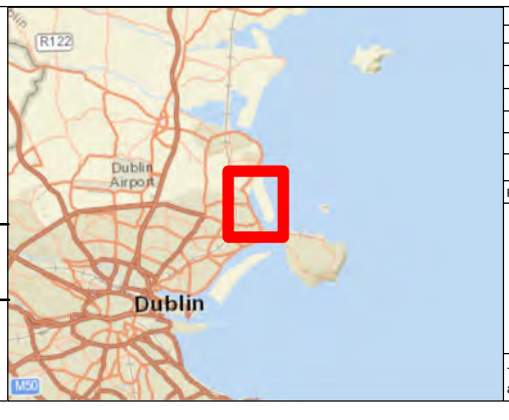
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.32 Moorhen Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1032

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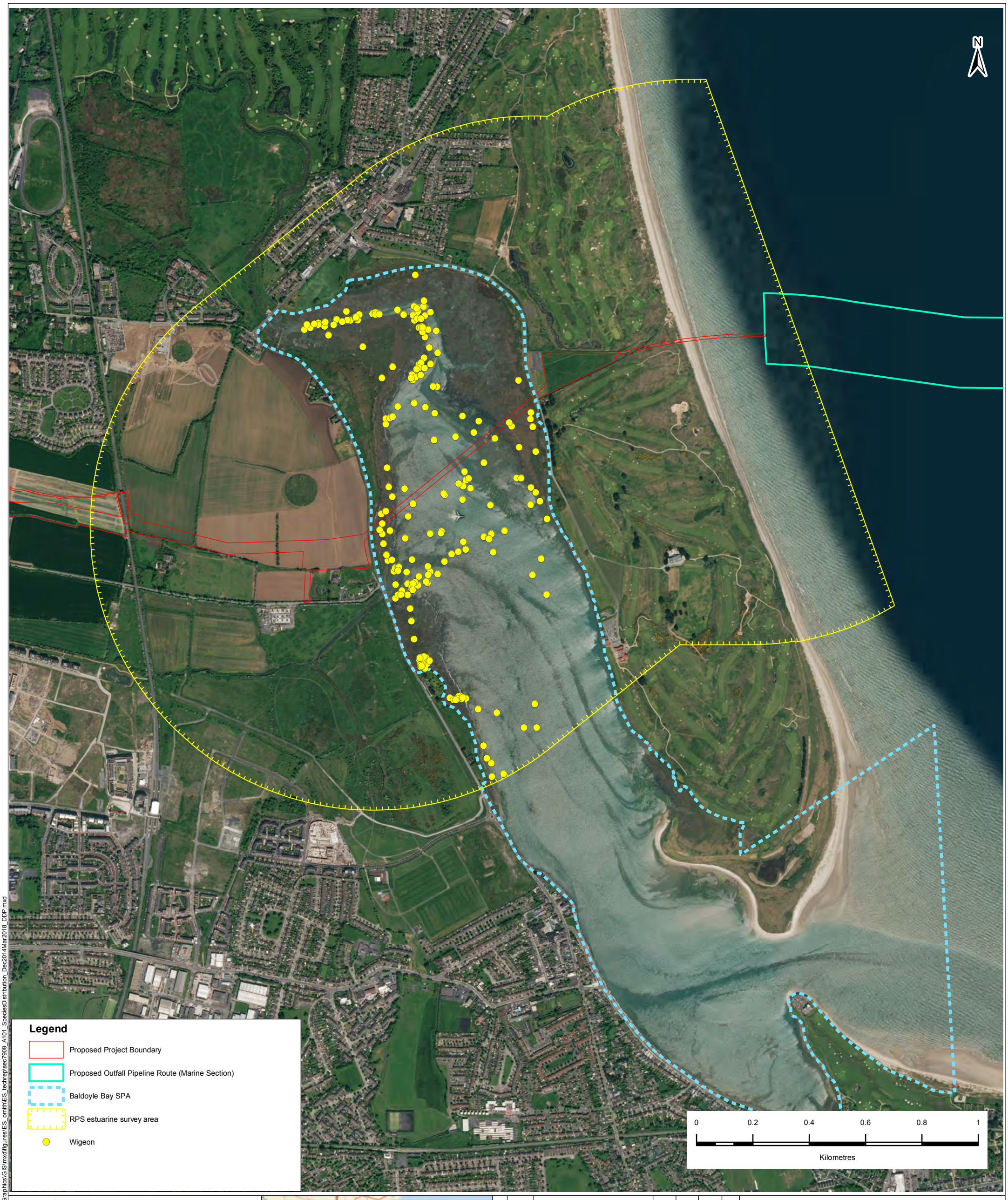

Greater Dublin Drainage

Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.33 Wigeon Records in Baldoyle Bay (Dec 2014 to March 2018)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1033

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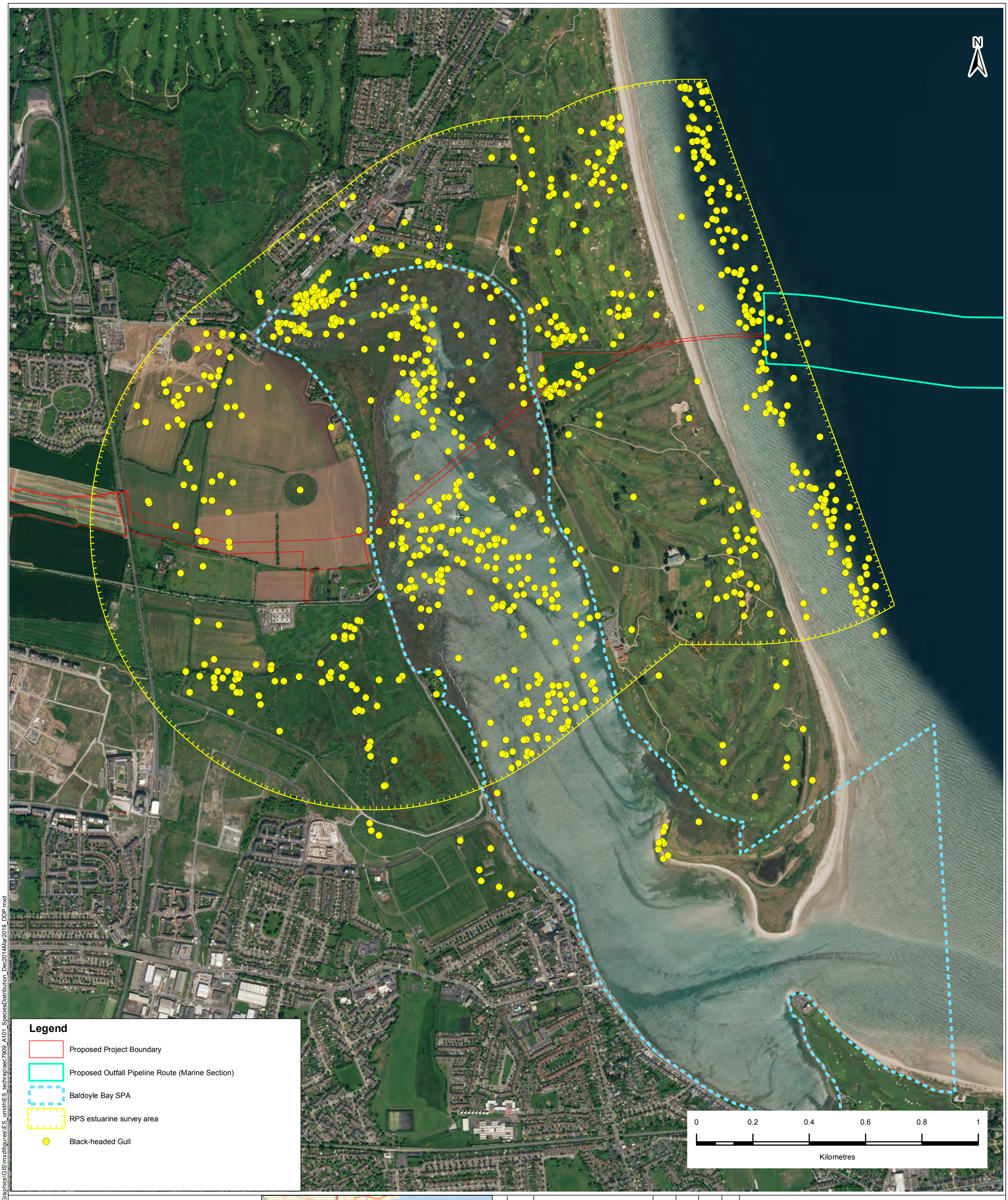

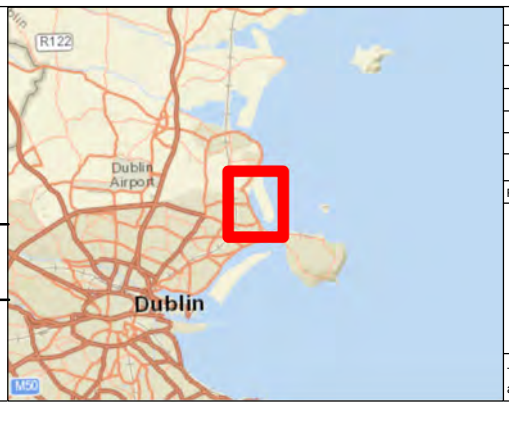

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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Project
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Drawing Title
Figure A10.34 Black-headed Gull Records in Baldoyle Bay (Dec 2014 to March 2018)

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1034

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Common Gull

0 0.2 0.4 0.6 0.8 1

Kilometres

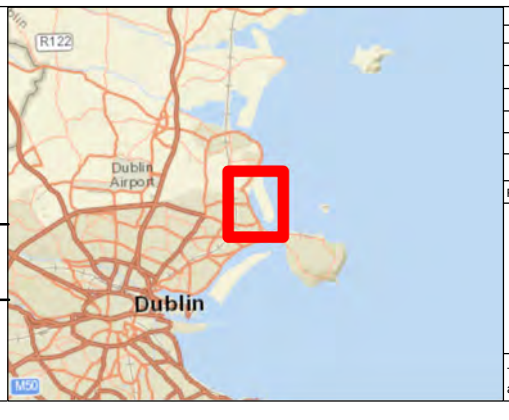
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.35 Common Gull Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1035

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Great Black-backed Gull

0 0.2 0.4 0.6 0.8 1

Kilometres

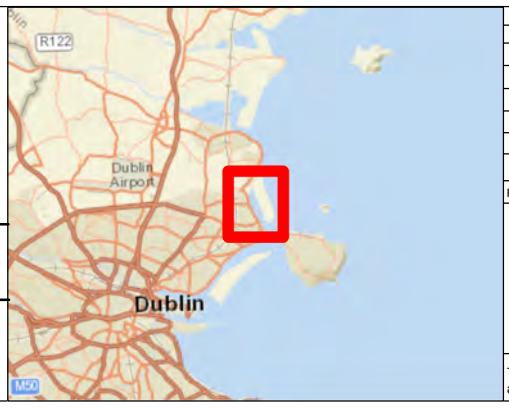
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.36 Great Black-backed Gull Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1036

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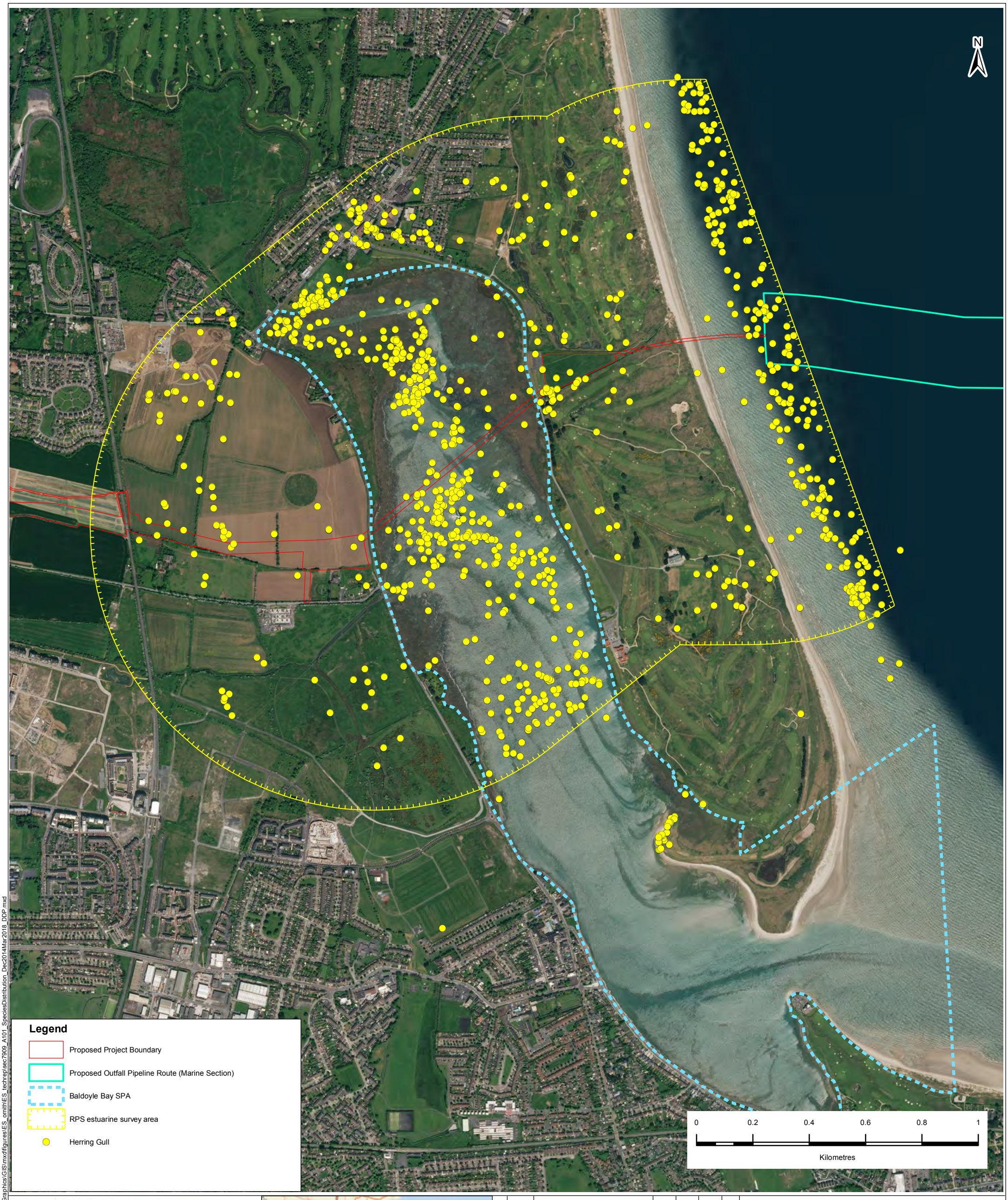

Greater Dublin Drainage

Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.37 Herring Gull Records in Baldoyle Bay (Dec 2014 to March 2018)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1037

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N

0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Kittiwake

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Project

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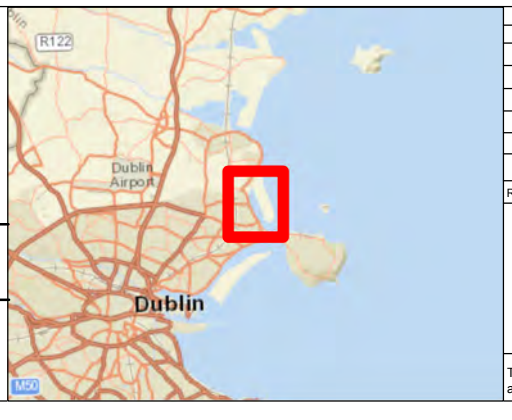
Drawing Title

Figure A10.38 Kittiwake Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1038

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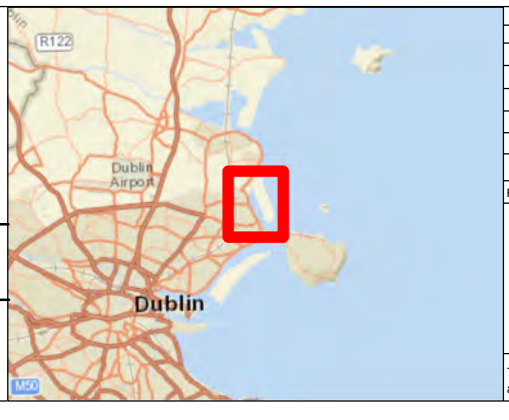
N

0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Lesser Black-backed Gull



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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Project
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Drawing Title
Figure A10.39 Lesser Black-backed Gull Records in Baldoyle Bay (Dec 2014 to March 2018)

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1039

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Little Egret

0 0.2 0.4 0.6 0.8 1

Kilometres

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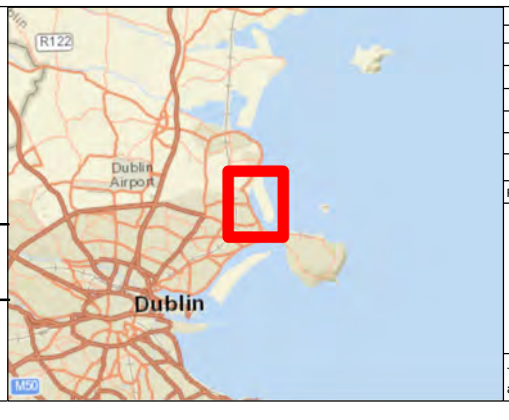
Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.40 Little Egret Records in Baldoyle Bay (Dec 2014 to March 2018)



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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1040

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Buzzard

0 0.2 0.4 0.6 0.8 1

Kilometres

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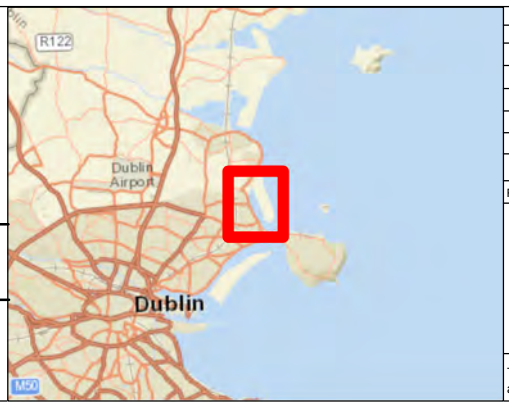
Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.41 Buzzard Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1041

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Peregrine

0 0.2 0.4 0.6 0.8 1

Kilometres

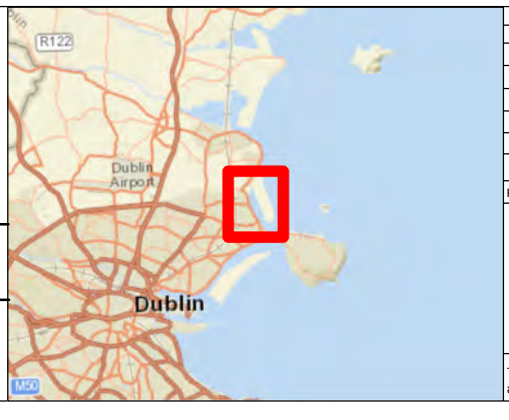
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.42 Peregrine Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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Drawing Status	At issue
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Job No.	SEC7909
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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Cormorant

0 0.2 0.4 0.6 0.8 1

Kilometres

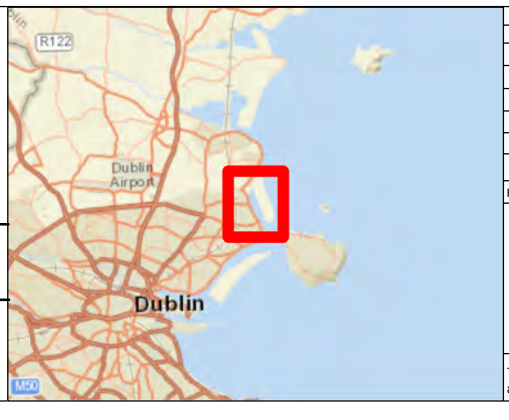
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.43 Cormorant Records in Baldoyle Bay (Dec 2014 to March 2018)



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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
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JACOBS TOBIN

Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1043

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Shag

0 0.2 0.4 0.6 0.8 1

Kilometres

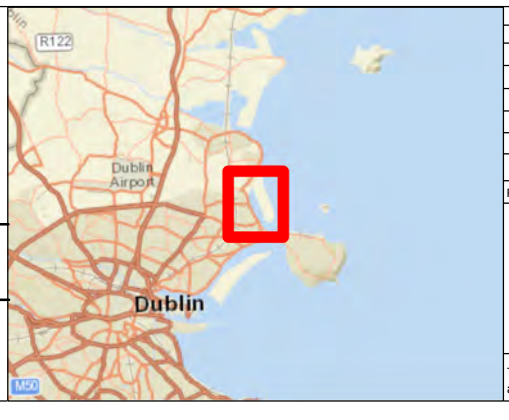
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.44 Shag Records in Baldoyle Bay (Dec 2014 to March 2018)



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JACOBS TOBIN

Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1044

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N

0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Common Tern

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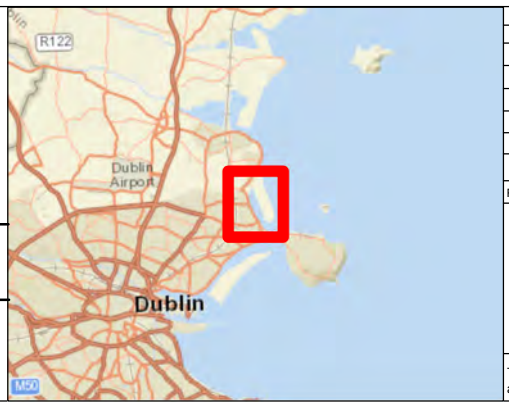
Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.45 Common Tern Records in Baldoyle Bay (Dec 2014 to March 2018)



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JACOBS TOBIN

Drawing Status	At issue
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Job No.	SEC7909
Drawing No.	32102902-EIAR-A1045

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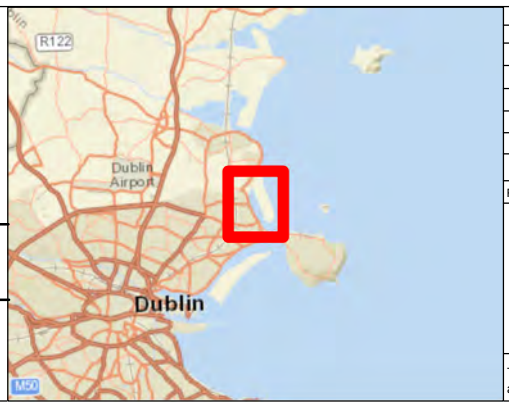
N

0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Sandwich Tern



Greater Dublin Drainage

Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.46 Sandwich Tern Records in Baldoyle Bay (Dec 2014 to March 2018)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1046

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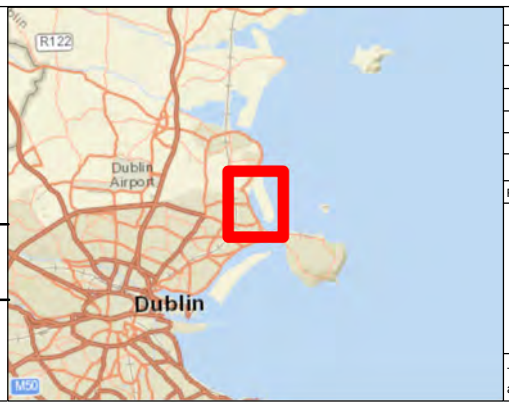
0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Common Sandpiper



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.47 Common Sandpiper Records in Baldoyle Bay (Dec 2014 to March 2018)

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Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1047

W:\7909SEC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\figures\ES_ornith\ES_techrep\sec7909_A101_SpeciesDistribution_Dec2014Mar2018_DDP.mxd

N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Common Snipe

0 0.2 0.4 0.6 0.8 1

Kilometres

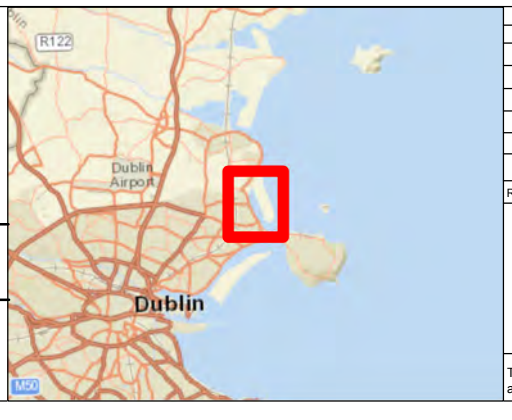
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.48 Common Snipe Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1048

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Whimbrel

0 0.2 0.4 0.6 0.8 1

Kilometres

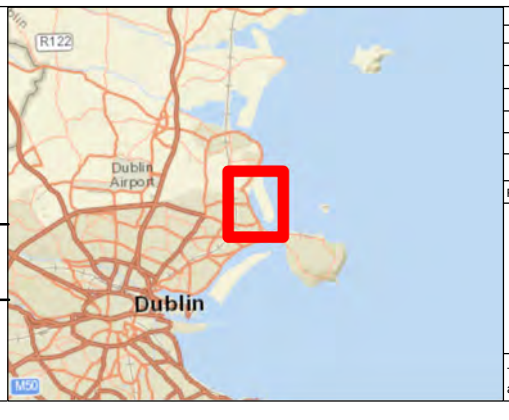
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.49 Whimbrel Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1049

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Greater Dublin Drainage

Project
Greater Dublin Drainage Project

Drawing Title
Figure A10.50 Kestrel Records in Baldoyle Bay (Dec 2014 to March 2018)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1050

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N

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Mediterranean Gull

0 0.2 0.4 0.6 0.8 1

Kilometres

Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.51 Mediterranean Gull Records in Baldoyle Bay (Dec 2014 to March 2018)

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1051

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Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Roseate Tern

0 0.2 0.4 0.6 0.8 1

Kilometres

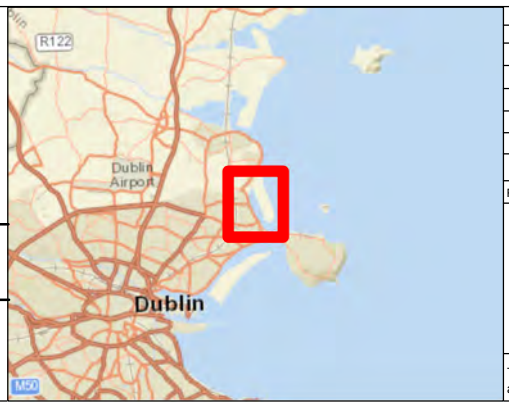
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.52 Roseate Tern Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1052

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N

0 0.2 0.4 0.6 0.8 1

Kilometres

Legend

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- Baldoyle Bay SPA
- RPS estuarine survey area
- Ruff

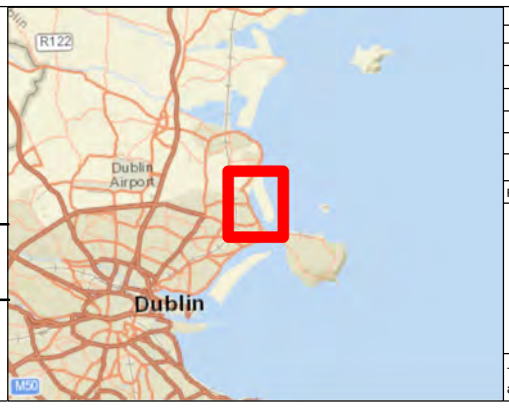
Greater Dublin Drainage

Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.53 Ruff Records in Baldoyle Bay (Dec 2014 to March 2018)



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/18	Additional survey data	CH	RI	KAG	RI
1	19/03/18	Infrastructure updated	CH	RI	KAG	RI
0	17/10/17	Draft	CH	RI	KAG	RI

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JACOBS TOBIN

Drawing Status	At issue
Scale @ A3	1:12,500
Job No.	SEC7909
Drawing No.	32102902-EIAR-A1053

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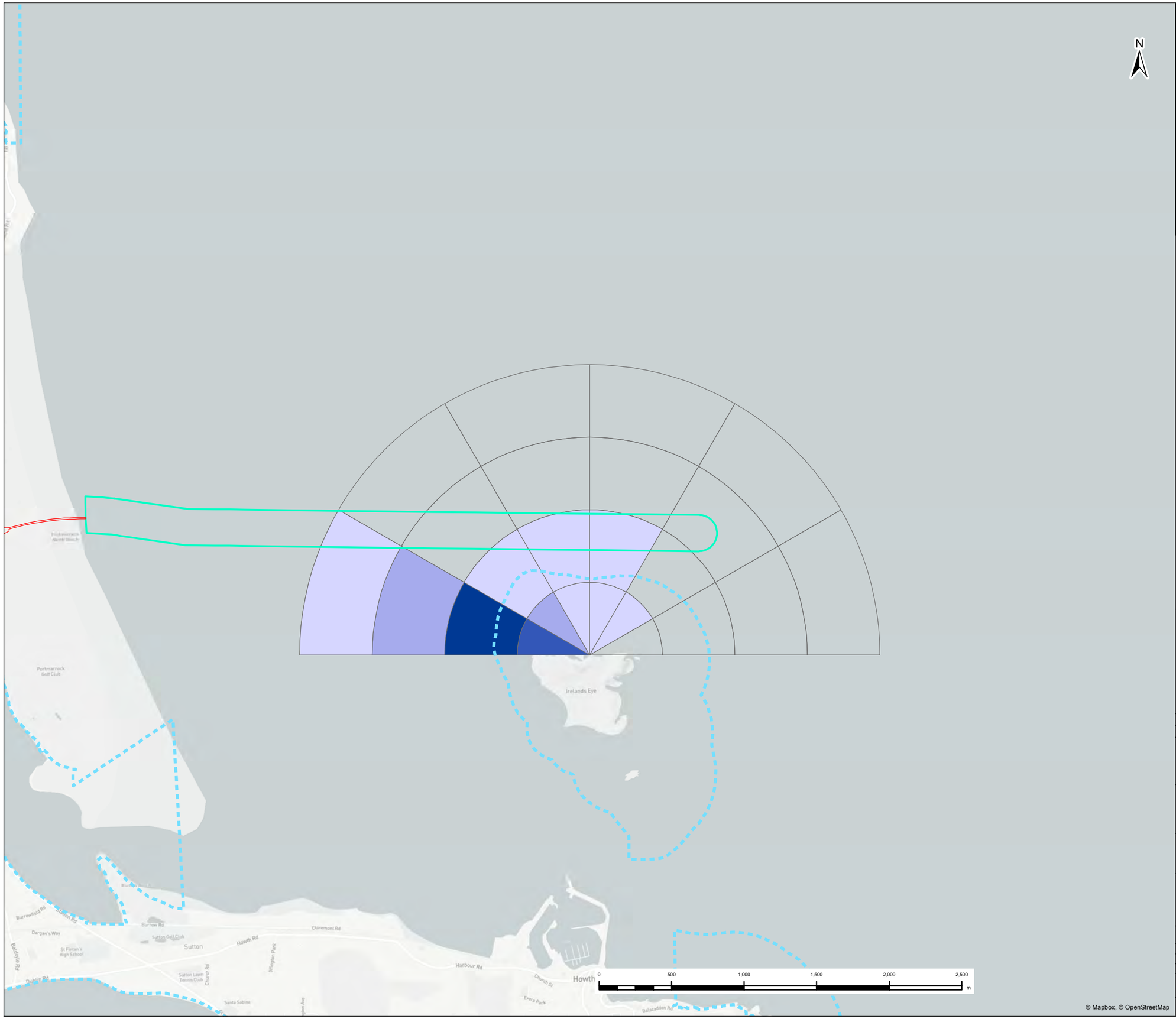

Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Black guillemot - all behaviours

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/2018	Infrastructure updated	CH	RI	KG	RI

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Client

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Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.54 Distribution of all on sea black guillemot records from Ireland's Eye VP during breeding season (March to October)

Drawing Status **At issue**

Scale @A3	1:25,000
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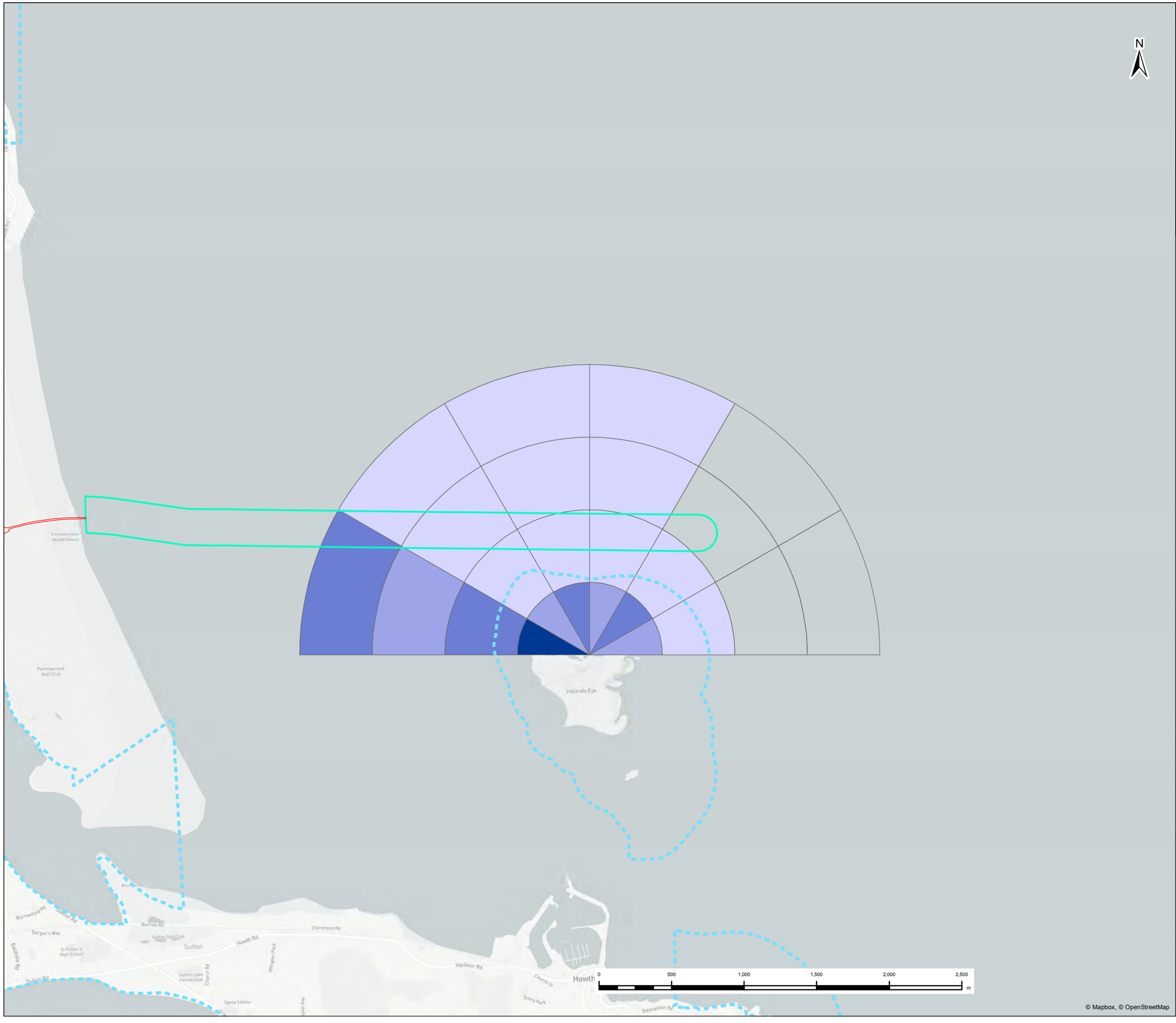
Drawing No. 32102902-EIAR-A1054



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Cormorant - all behaviours

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/2018	Infrastructure updated	CH	RI	KG	RI

JACOBS TOBIN Patrick J. Tobin & Co. Ltd.

Client: UISCE ÉIREANN WATER

Project: Greater Dublin Drainage Project

Drawing Title: Figure A10.55 Distribution of all on sea cormorant records from Ireland's Eye VP during breeding season (March to October)

Drawing Status: **At issue**

Scale @A3	1:25,000
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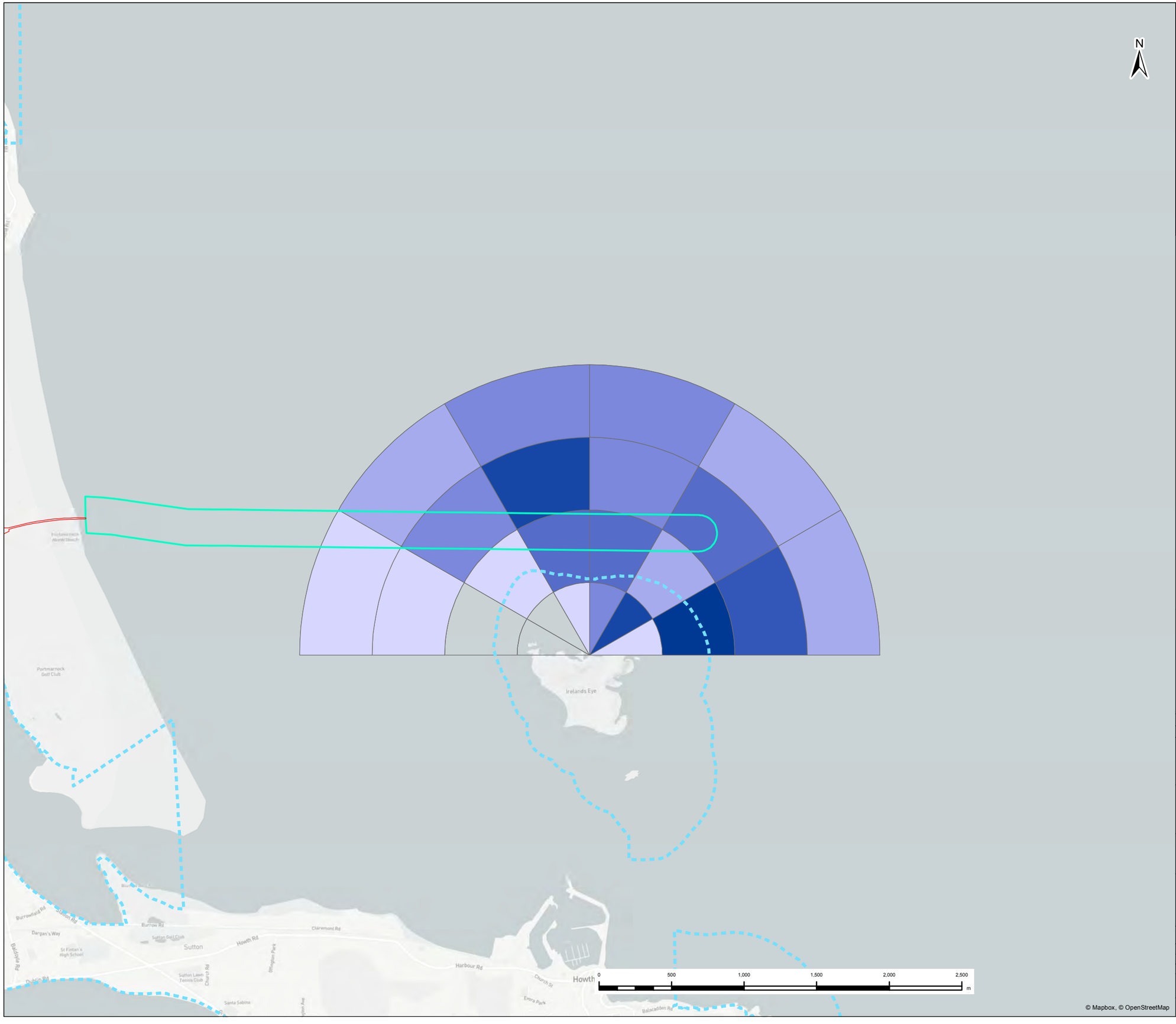
Drawing No. 32102902-EIAR-A1055



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Fulmar - all behaviours

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25
- 26 - 30
- 31 - 35

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client

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Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.56 Distribution of all on sea fulmar records from Ireland's Eye VP during breeding season (March to October)

Drawing Status: **At issue**

Scale @A3	1:25,000
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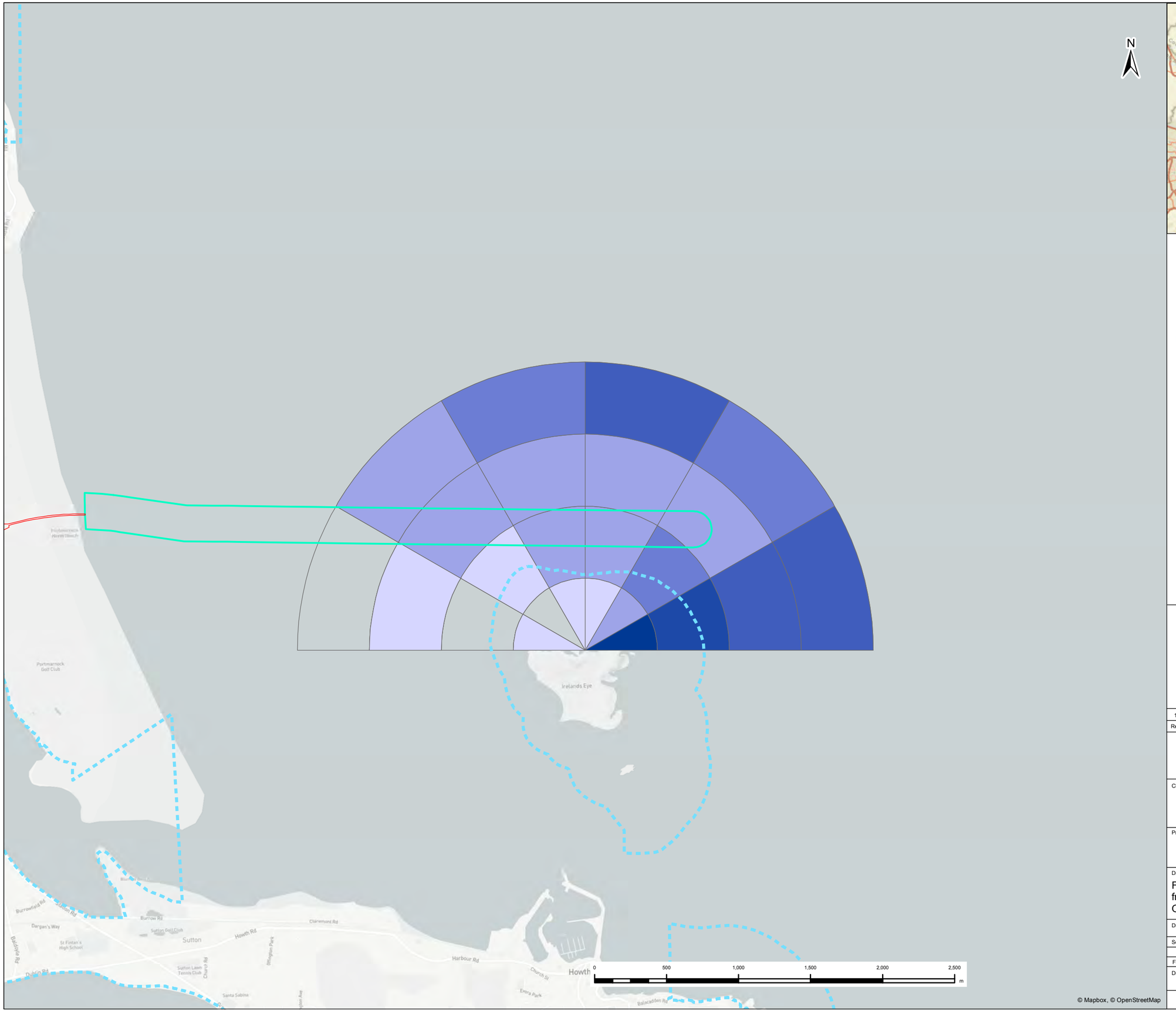
Drawing No.

32102902-EIAR-A1056



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Gannet - all behaviours

- 3 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 125
- 126 - 150

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/2018	Infrastructure updated	CH	RI	KG	RI

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Client: UISCE ÉIREANN : IRISH WATER

Project: Greater Dublin Drainage Project

Drawing Title: Figure A10.57 Distribution of all on sea gannet records from Ireland's Eye VP during breeding season (March to October)

Drawing Status: **At issue**

Scale @A3	1:25,000
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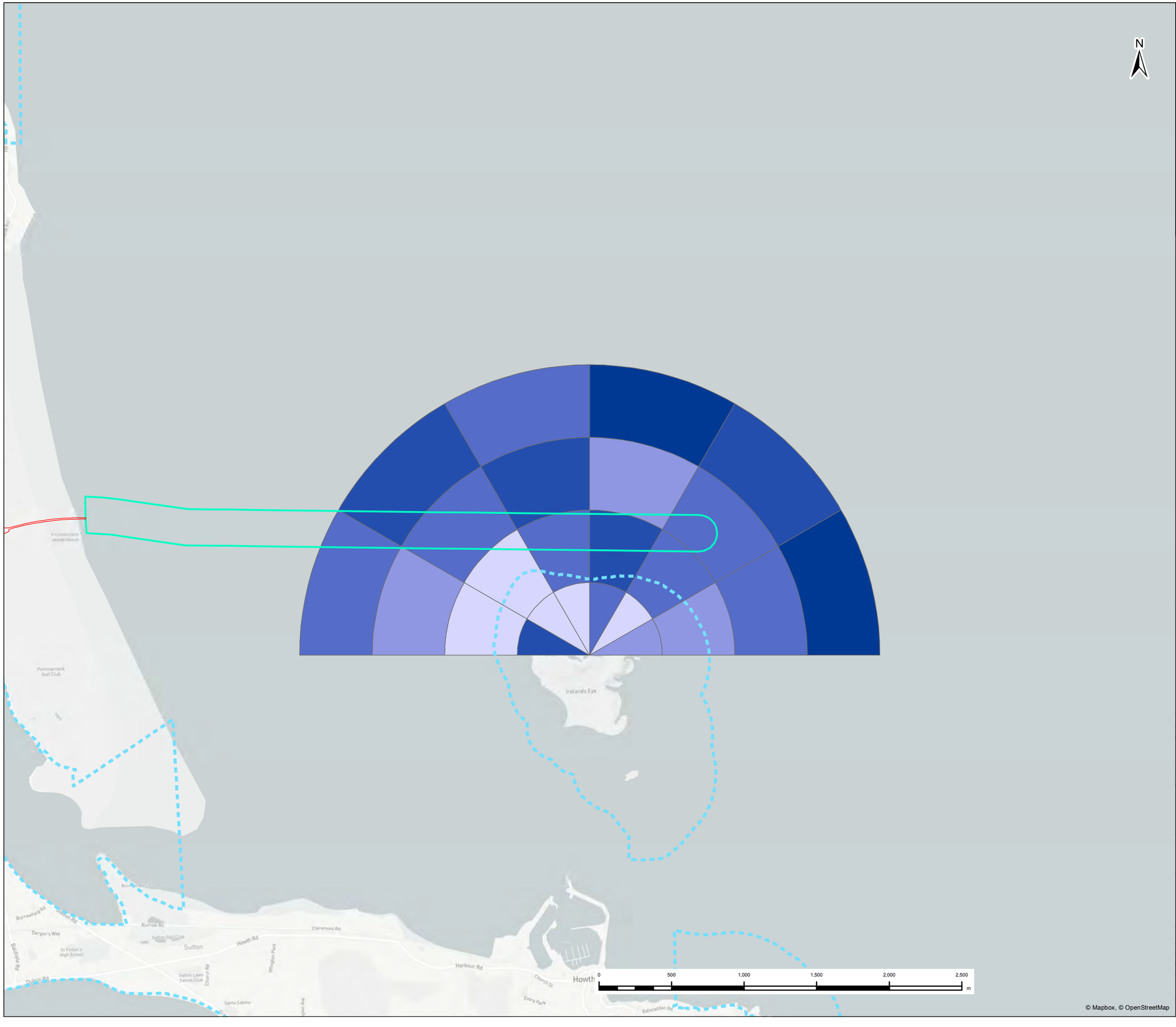
Drawing No. 32102902-EIAR-A1057



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Great black-backed gull - all behaviours

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	21/05/2018	Infrastructure updated	CH	RI	KG	RI

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Client: UISCE ÉIREANN · IRISH WATER

Project: Greater Dublin Drainage Project

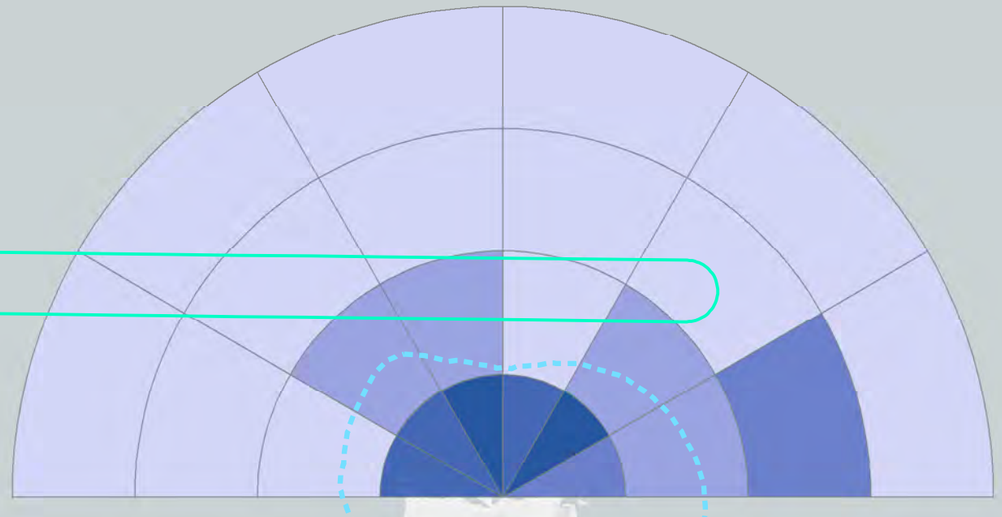
Drawing Title: Figure A10.58 Distribution of all on sea great black-backed gull records from Ireland's Eye VP during breeding season (March to October)

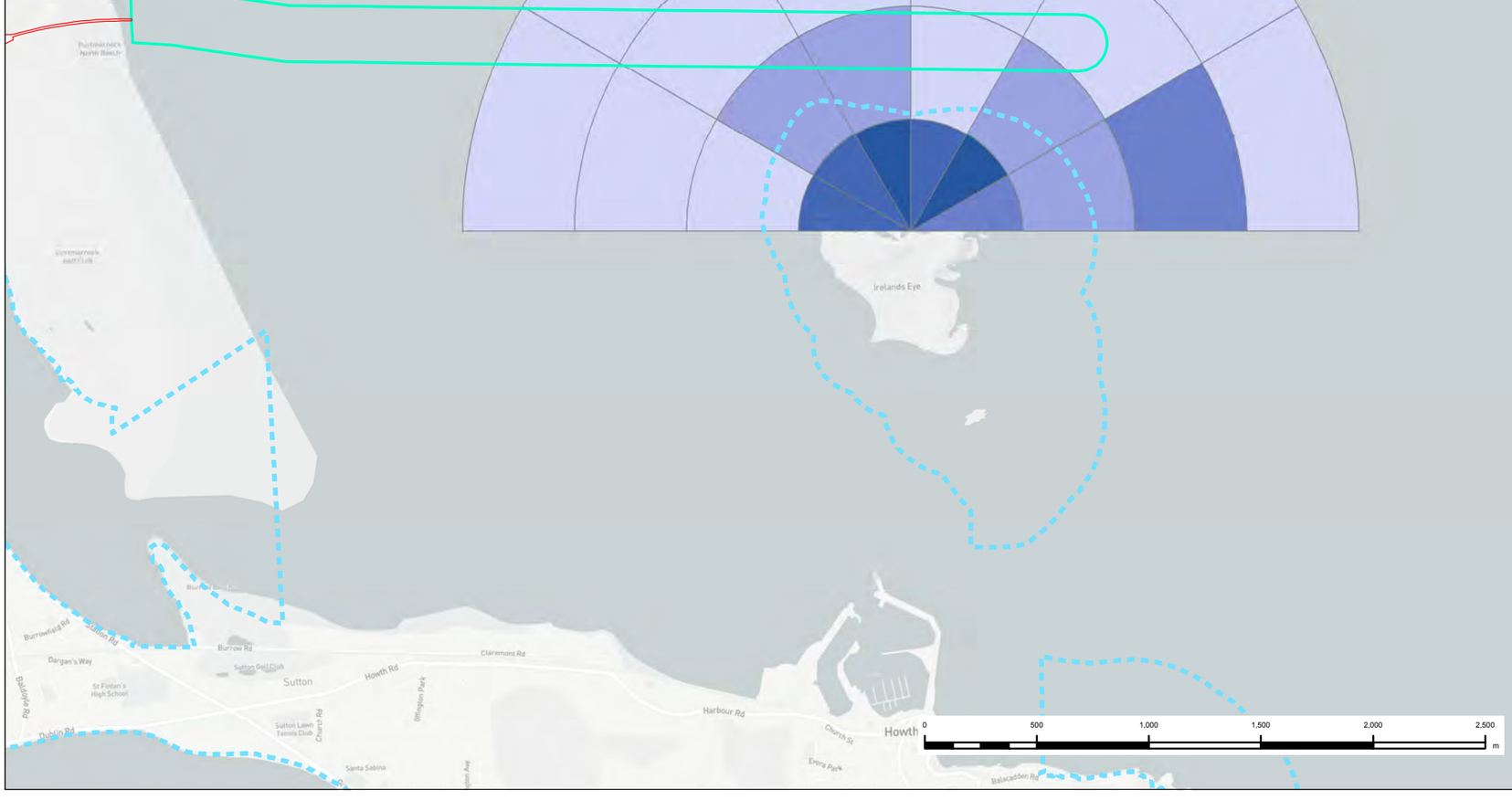
Drawing Status: **At issue**

Scale @A3	1:25,000
Filepath	W:\75\05\ECC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\Figures\03_ornithGIS_technical\mxd\75058_A1058_GB_orniWaterMarTroOct_VP2.mxd

Drawing No. 32102902-EIAR-A1058

N





Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Guillemot - all behaviours

- 32 - 200
- 201 - 400
- 401 - 600
- 601 - 800
- 801 - 1000

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Project

Greater Dublin Drainage Project

Drawing Title

Figure A10.59 Distribution of all on sea guillemot records from Ireland's Eye VP during breeding season (March to October)

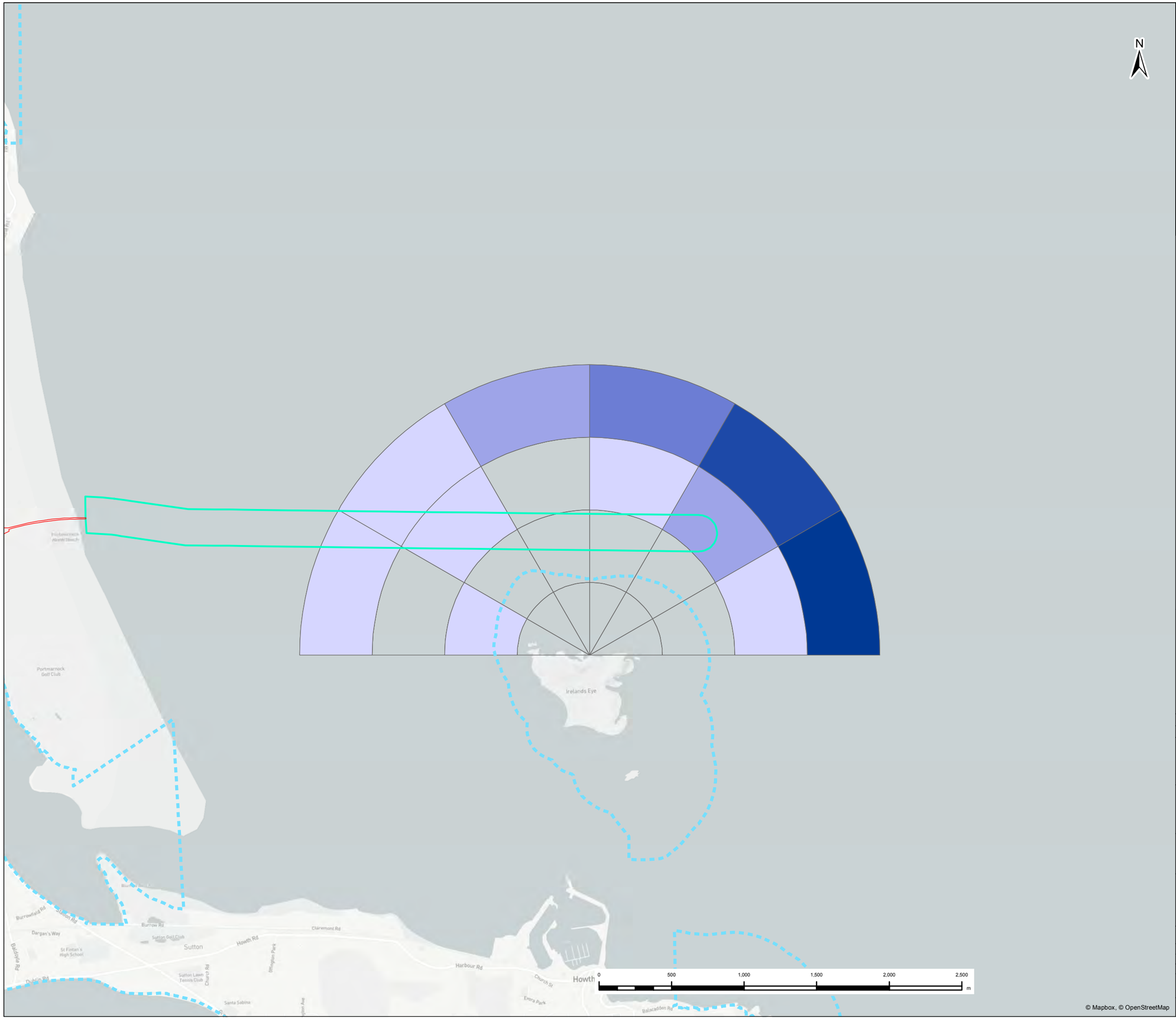
Drawing Status: **At issue**

Scale @A3: 1:25,000

Filepath: W:\75058SC - RPS Belfast, WW EIS NIS Co-Ords\egg\Technical\Graphics\GIS\mxd\Figure\EIS_print\EIS_technpaper\7606_A1059_GLL_withworkforTobin_VP2.mxd

Drawing No.

32102902-EIAR-A1059



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Guillemot or razorbill - all behaviours

- 3 - 75
- 76 - 150
- 151 - 225
- 226 - 300
- 301 - 375
- 376 - 450

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client: UISCE ÉIREANN : IRISH WATER

Project: Greater Dublin Drainage Project

Drawing Title: Figure A10.60 Distribution of all on sea guillemot or razorbill records from Ireland's Eye VP during breeding season (March to October)

Drawing Status	**At issue**
Scale @A3	1:25,000
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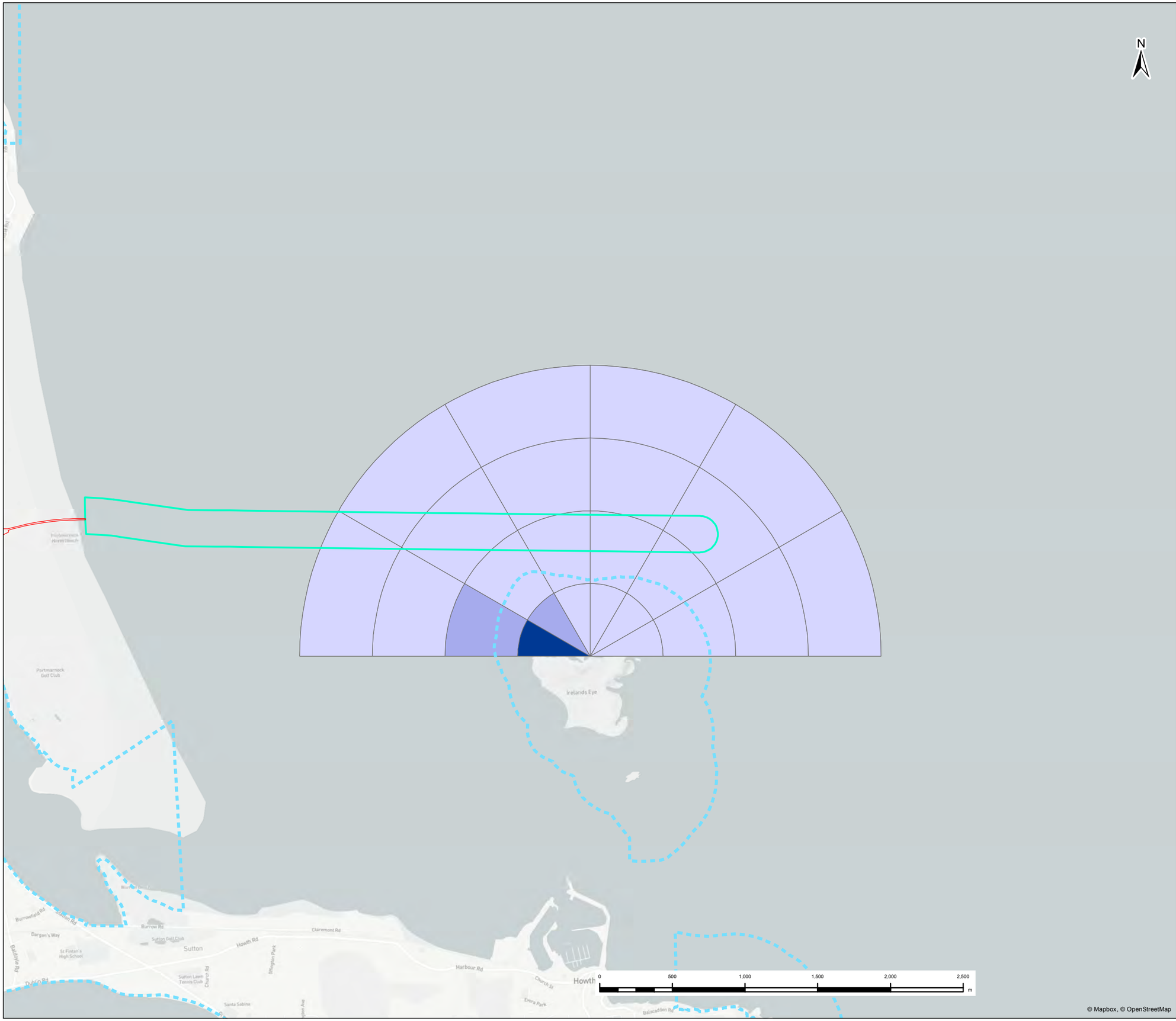
Drawing No. 32102902-EIAR-A1060



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Herring gull - all behaviours

- 7 - 150
- 151 - 300
- 301 - 450
- 451 - 600
- 601 - 750
- 751 - 900
- 901 - 1050

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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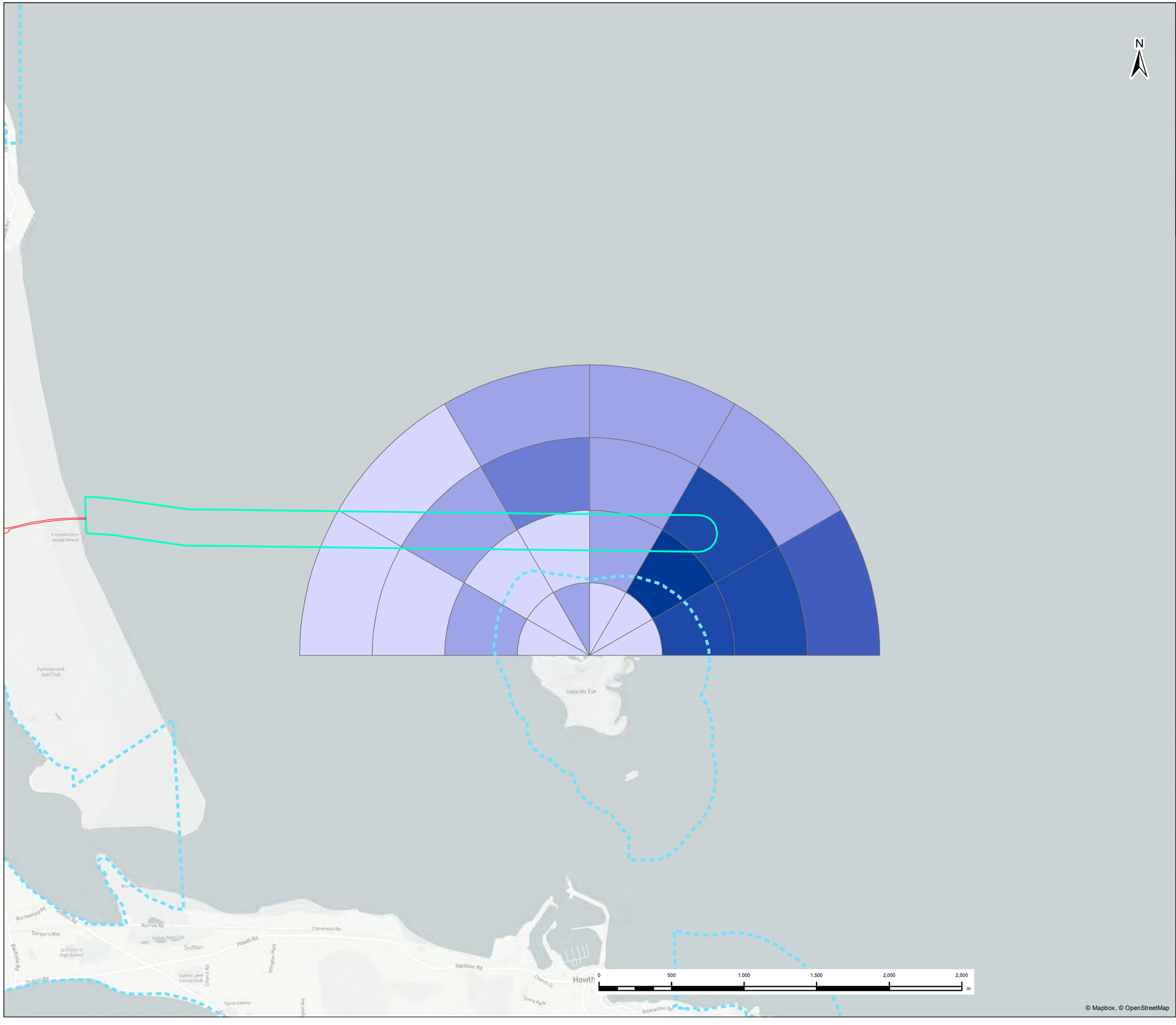
Client: UISCE ÉIREANN : IRISH WATER

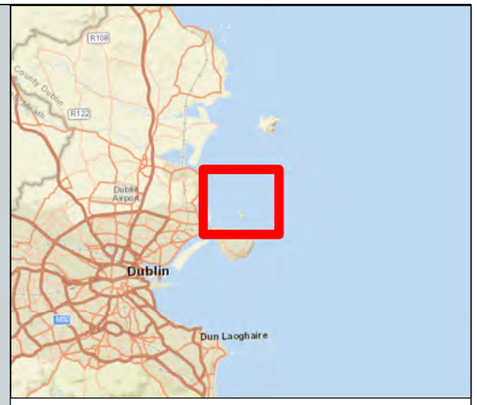
Project: Greater Dublin Drainage Project

Drawing Title: Figure A10.61 Distribution of all on sea herring gull records from Ireland's Eye VP during breeding season (March to October)

Drawing Status	**At issue**
Scale @A3	1:25,000
Filepath	W:\75\065\EC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\figures\EIS_ornithEIS_technical\7506_A1061_HG_onWaterMarToOct_VP2.mxd

Drawing No. 32102902-EIAR-A1061





Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Kittiwake - all behaviours

- 9 - 75
- 76 - 150
- 151 - 225
- 226 - 300
- 301 - 375
- 376 - 450

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client

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Project

Greater Dublin Drainage Project

Drawing Title

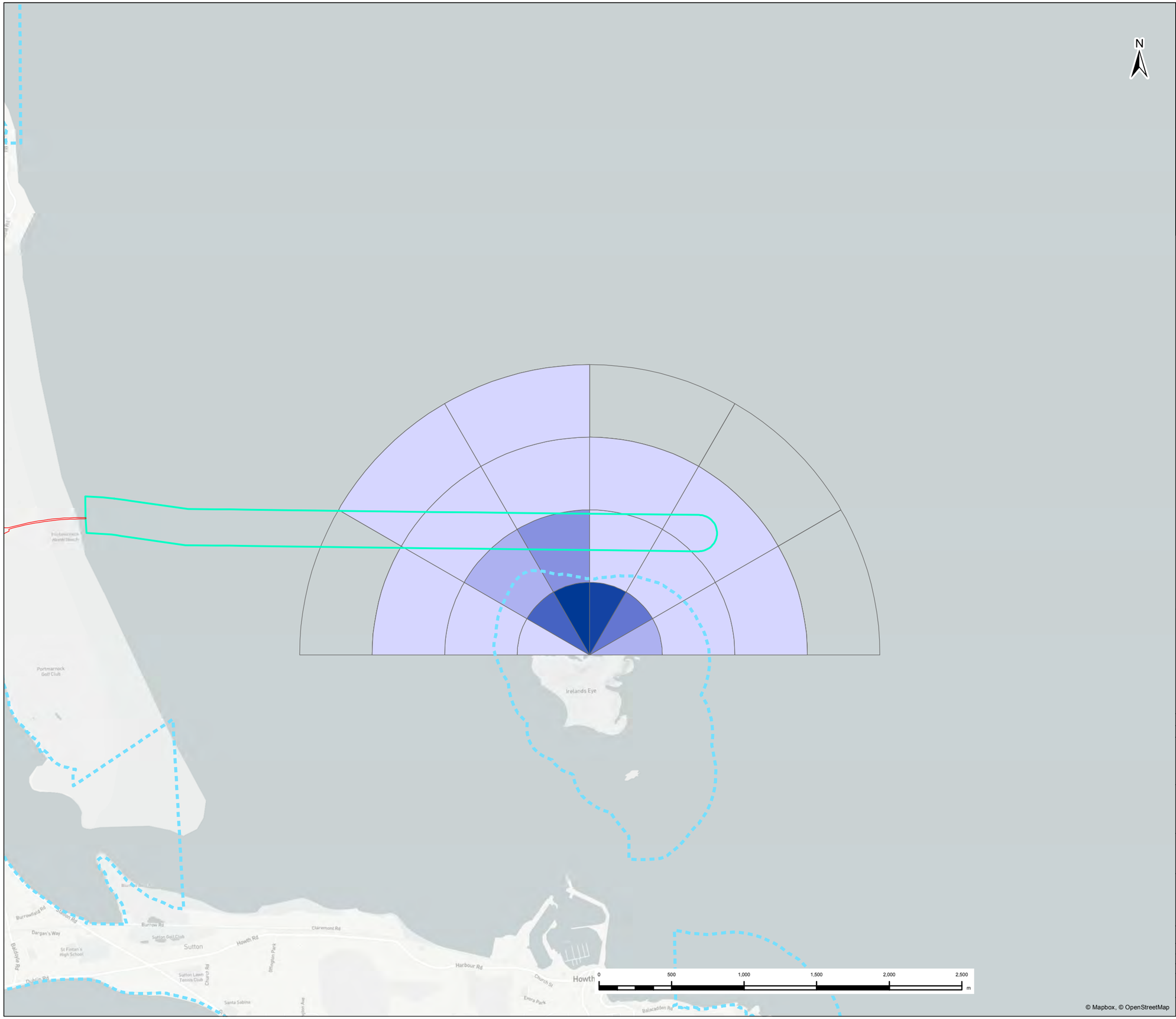
Figure A10.62 Distribution of all on sea kittiwake records from Ireland's Eye VP during breeding season (March to October)

Drawing Status: **At issue**

Scale @A3: 1:25,000

Filepath: W:\7903SEC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\Figures\03_printed\03_technique\7909_A1062_KI_onWaterWinTotOct_VP2.mxd

Drawing No.: 32102902-EIAR-A1062



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Puffin - all behaviours

- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 125
- 126 - 150
- 151 - 175
- 176 - 200

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client: UISCE ÉIREANN : IRISH WATER

Project: Greater Dublin Drainage Project

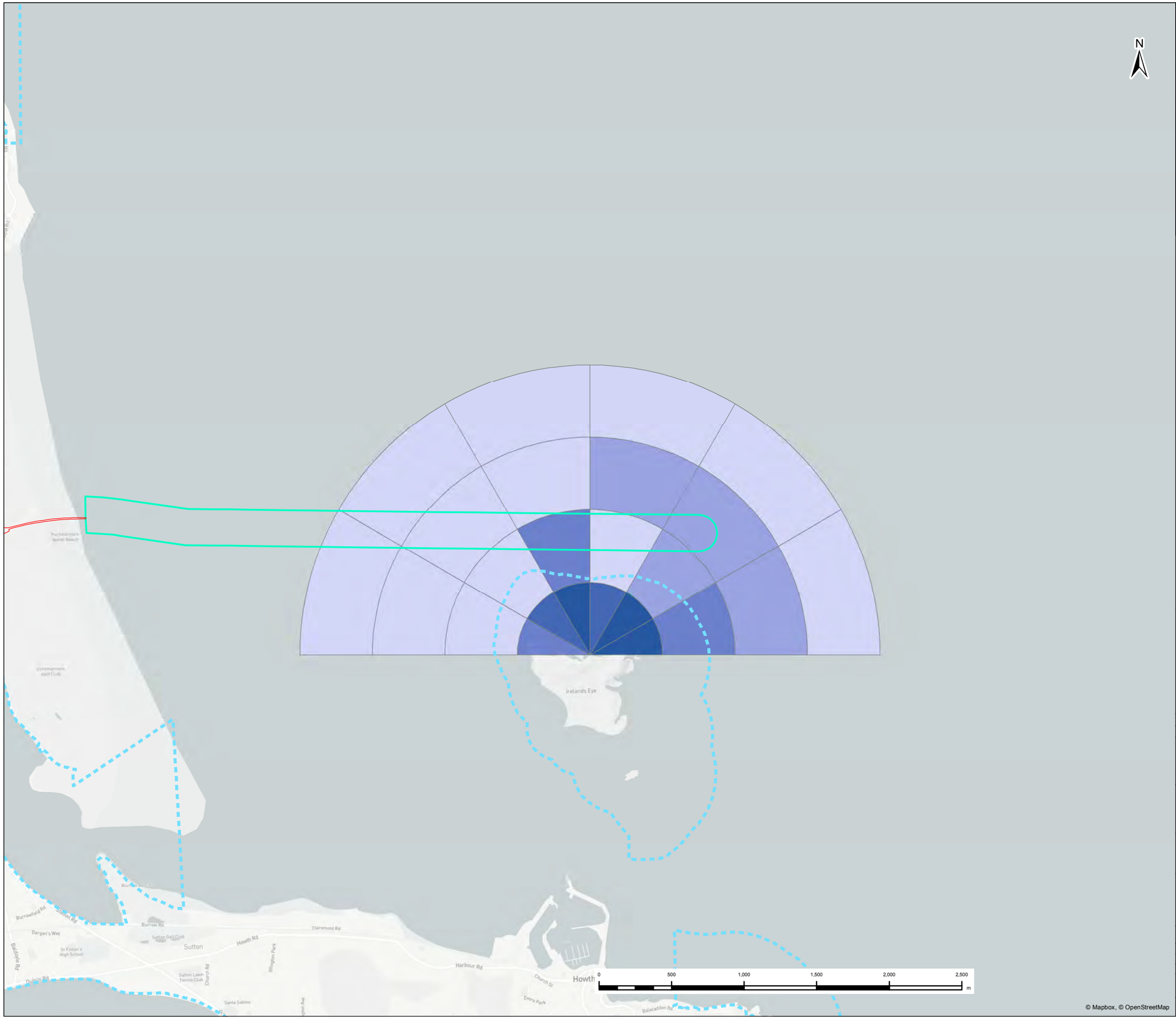
Drawing Title: Figure A10.63 Distribution of all on sea puffin records from Ireland's Eye VP during breeding season (March to October)

Drawing Status: **At issue**

Scale @A3: 1:25,000

Filepath: W:\75\05\EC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\Figures\03_ornithGIS_technique\75005_A1063_PU_onWaterMar To Oct_VP2.mxd

Drawing No.: 32102902-EIAR-A1063



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Razorbill - all behaviours

- 31 - 175
- 176 - 350
- 351 - 525
- 526 - 700
- 701 - 875

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client

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Project

Greater Dublin Drainage Project

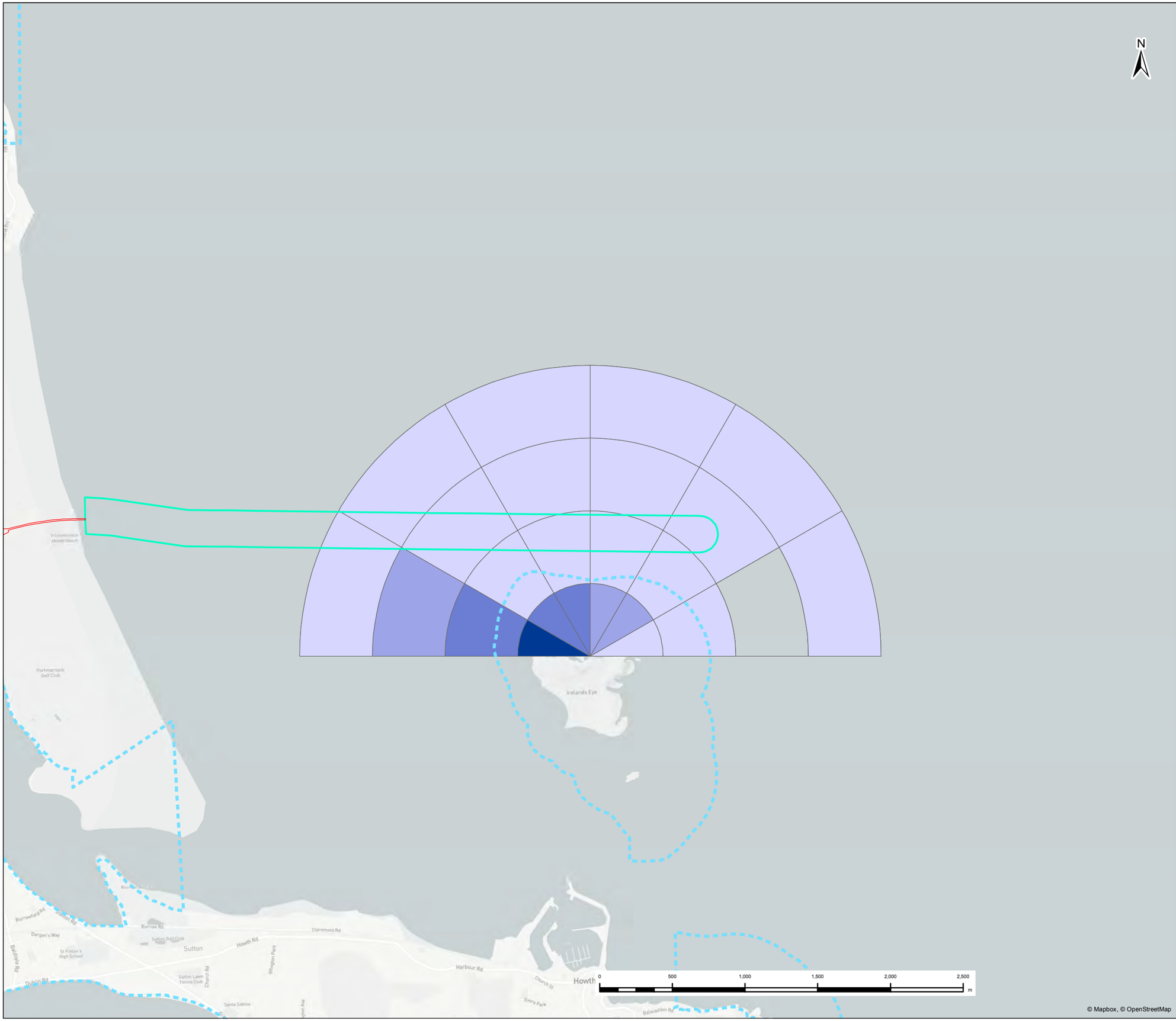
Drawing Title

Figure A10.64 Distribution of all on sea razorbill records from Ireland's Eye VP during breeding season (March to October)

Drawing Status	**At issue**
Scale @A3	1:25,000
Filepath	W:\75\065\EC - RPS Belfast, WW EIS NIS Ornithology\Technical\Graphics\GIS\mxd\Figures\03_ornith03_technpriec7508_A1064_KA_onWaterMarToOc_VP2.mxd

Drawing No.

32102902-EIAR-A1064



Key

- Proposed Project Boundary
- Proposed Outfall Pipeline Route (Marine Section)
- SPA boundaries

Index of abundance

Shag - all behaviours

- 1 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 250
- 251 - 300

Greater Dublin Drainage

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
2	21/05/2018	Additional survey data included	CH	RI	KG	RI

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Client: UISCE ÉIREANN : IRISH WATER

Project: Greater Dublin Drainage Project

Drawing Title: Figure A10.65 Distribution of all on sea shag records from Ireland's Eye VP during breeding season (March to October)

Drawing Status	**At issue**
Scale @A3	1:25,000
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APPENDIX 1 – ESTUARINE BIRD SURVEY EFFORT

Date	Surveyor*	Start Time	Finish Time	Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**	Area surveyed
16/12/2014	AMcC	11:00	14:10	03:10	1.99	2.11	2.32	0.33	L	Partial
22/12/2014	AMcC	09:40	12:00	02:20	4.44	4.80	4.95	0.51	H	Partial
13/01/2015	AMcC	09:00	12:00	03:00	2.06	2.21	2.49	0.43	L	Partial
13/01/2015	AMcC	12:00	15:00	03:00	2.49	3.20	3.85	1.36	T	Partial
20/01/2015	KM	09:00	11:55	02:55	4.13	4.64	4.85	0.72	H	Full
20/01/2015	KM	11:55	14:50	02:55	2.03	3.44	4.58	2.55	T	Full
20/02/2015	NV	08:30	14:30	06:00	2.85	4.40	5.14	2.29	H	Full
27/02/2015	NV	08:30	14:30	06:00	1.59	2.10	3.27	1.68	T	Full
11/03/2015	NV	08:00	14:00	06:00	1.36	2.62	4.16	2.8	T	Full
19/03/2015	NV	10:00	16:00	06:00	0.47	2.73	4.57	4.1	T	Full
13/04/2015	NV	07:30	13:30	06:00	1.48	2.15	3.58	2.1	T	Full
20/04/2015	NV	07:30	13:30	06:00	1.47	3.74	4.80	3.33	T	Full
18/05/2015	NV	05:15	11:15	06:00	1.07	3.23	4.94	3.87	T	Full
27/05/2015	NV	08:00	14:00	06:00	1.59	2.23	3.52	1.93	T	Full
05/06/2015	NV	06:30	12:30	06:00	1.00	2.66	4.47	3.47	T	Full
30/06/2015	NV	09:15	15:15	06:00	1.42	3.18	4.29	2.87	T	Full
06/07/2015	NV	07:00	13:00	06:00	0.91	2.15	4.10	3.19	T	Full
15/07/2015	NV	09:00	15:00	06:00	1.74	3.51	4.27	2.53	T	Full
03/08/2015	NV	08:00	14:00	06:00	1.26	3.51	4.84	3.58	T	Full
25/08/2015	NV	09:15	15:15	06:00	1.98	2.41	3.40	1.42	T	Full
02/09/2015	NV	07:30	13:30	06:00	0.62	2.76	4.61	3.99	T	Full
22/09/2015	NV	07:30	13:30	06:00	1.84	2.26	3.22	1.38	T	Full
02/10/2015	NV	09:30	15:30	06:00	1.71	3.62	4.51	2.8	T	Full
21/10/2015	NV	08:00	14:00	06:00	2.01	2.39	3.06	1.05	T	Full
08/11/2015	NV	08:00	13:48	05:48	2.20	3.66	4.39	2.19	T	Full
19/11/2015	NV	08:45	14:45	06:00	1.73	2.39	3.65	1.92	T	Full
08/12/2015	NV	09:30	15:30	06:00	1.87	3.17	4.51	2.64	T	Full
14/12/2015	NV	09:30	15:30	06:00	3.05	4.32	4.95	1.9	H	Full
07/01/2016	NV	09:30	15:30	06:00	1.85	3.28	4.61	2.76	T	Full
21/01/2016	NV	09:00	15:00	06:00	1.58	3.21	4.54	2.96	T	Full
15/02/2016	NV	10:00	16:00	06:00	1.11	2.52	4.14	3.03	T	Full
22/02/2016	NV	11:00	17:00	06:00	1.37	3.39	4.60	3.23	T	Full
10/03/2016	NV	10:00	16:00	06:00	1.40	3.77	4.70	3.3	T	Full
16/03/2016	NV	12:00	18:00	06:00	1.47	2.84	3.89	2.42	T	Full
01/04/2016	NV	09:00	15:00	06:00	1.95	2.32	3.09	1.14	T	Full
18/04/2016	NV	08:00	14:00	06:00	1.70	3.40	4.23	2.53	T	Full
06/05/2016	NV	09:00	15:00	06:00	1.31	3.75	4.82	3.51	T	Full
22/05/2016	NV	06:00	12:00	06:00	1.43	3.18	4.49	3.06	T	Full

Date	Surveyor*	Start Time	Finish Time	Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**	Area surveyed
16/03/2017	NV	07:00	13:00	06:00	1.07	2.62	4.44	3.37	T	Full
28/03/2017	NV	09:20	15:20	06:00	1.91	4.04	4.88	2.97	T	Full
12/04/2017	NV	11:30	17:30	06:00	1.05	3.17	4.60	3.55	T	Full
26/04/2017	NV	05:38	11:38	06:00	1.12	3.37	4.68	3.56	T	Full
17/05/2017	NV	05:20	16:20	11:00	1.60	2.76	4.03	2.43	T	Full
18/05/2017	NV	11:00	17:00	06:00	1.85	3.04	3.92	2.07	T	Full
12/06/2017	NV	05:10	11:10	06:00	1.37	2.15	3.68	2.31	T	Full
28/06/2017	NV	12:30	18:30	06:00	2.17	3.87	4.57	2.4	T	Full
13/07/2017	NV	12:00	18:00	06:00	2.05	3.61	4.27	2.22	T	Full
19/07/2017	NV	08:00	14:00	06:00	1.46	2.51	4.21	2.75	T	Full
01/08/2017	NV	05:50	11:50	06:00	1.84	3.06	4.03	2.19	T	Full
21/08/2017	NV	06:00	12:00	06:00	1.51	3.55	4.62	3.11	T	Full
05/09/2017	NV	09:10	15:10	06:00	1.88	3.69	4.52	2.64	T	Full
12/09/2017	NV	10:30	16:30	06:00	1.76	3.45	4.40	2.64	T	Full
12/10/2017	NV	10:40	16:40	06:00	1.80	3.25	4.36	2.56	T	Full
26/10/2017	NV	13:00	18:00	05:00	3.21	3.85	4.15	0.94	H	Full
06/11/2017	NV	09:00	15:00	06:00	2.80	4.16	4.85	2.05	H	Full
20/11/2017	NV	08:30	14:30	06:00	2.82	4.20	4.81	1.99	H	Full
01/12/2017	NV	08:20	14:20	06:00	1.24	3.07	4.16	2.92	T	Full
11/12/2017	NV	08:15	14:15	06:00	1.82	2.25	3.19	1.37	T	Full
11/01/2018	NV	08:45	14:45	06:00	1.84	2.41	3.61	1.77	T	Full
22/01/2018	NV	08:50	14:50	06:00	1.54	3.22	4.47	2.93	T	Full
01/02/2018	NV	08:20	14:20	06:00	2.82	4.08	4.73	1.91	H	Full
27/02/2018	NV	07:00	13:00	06:00	2.19	3.72	4.36	2.17	T	Full
16/03/2018	NV	07:00	13:00	06:00	2.63	4.04	4.67	2.04	T	Full
28/03/2018	NV	09:20	15:20	06:00	1.01	2.50	4.30	3.29	T	Full

Notes:

* Surveyors: AMcC = Adam McClure, KM = Kevin Mawhinney, NV= Nick Veale.

** Tidal state for each survey is designated as follows. Surveys designated as 'high tide' (H) when survey mean tide >= mid height of the tide AND survey min tide >= highest low tide. Surveys designated as 'low tide'(L) when survey mean tide < the mid height of the tide AND survey max tide < lowest high tide. All other surveys are designate 'through the tide' 'T'

Table A10.1: Estuarine walkover survey effort December 2014 to March 2018

APPENDIX 2 – ESTUARINE BIRD SURVEY DATA

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
Bar-tailed godwit	2014	-	-	-	-	-	-	-	-	-	-	-	6	353	134	275
	2015	20	0	33	0	0	1	16	35	30	117	**273**	257			
	2016	57	99	78	13	1	-	-	-	-	-	-	-			
	2017	-	-	36	37	0	11	14	34	88	95	**276**	202			
	2018	81	201	36	-	-	-	-	-	-	-	-	-			
Brent goose (LB)	2014	-	-	-	-	-	-	-	-	-	-	-	475	726	874	816
	2015	543	296	364	403	0	0	0	0	8	174	706	803			
	2016	462	**991**	429	323	1	-	-	-	-	-	-	-			
	2017	-	-	328	270	0	0	0	0	0	231	524	**641**			
	2018	569	481	328	-	-	-	-	-	-	-	-	-			
Golden plover	2014	-	-	-	-	-	-	-	-	-	-	-	14	1810	914	3061
	2015	**2822**	120	447	87	0	0	0	65	0	870	680	750			
	2016	0	1850	950	0	0	-	-	-	-	-	-	-			
	2017	-	-	850	0	0	0	0	550	0	630	1700	1850			
	2018	950	**3300**	850	-	-	-	-	-	-	-	-	-			
Grey plover	2014	-	-	-	-	-	-	-	-	-	-	-	7	200	122	487
	2015	17	3	**669**	0	0	0	0	0	17	31	123	63			
	2016	7	77	**304**	6	0	-	-	-	-	-	-	-			

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
	2017	-	-	136	0	0	0	0	0	13	31	113	79			
	2018	24	72	136	-	-	-	-	-	-	-	-	-			
Ringed plover	2014	-	-	-	-	-	-	-	-	-	-	-	0	221	96	204
	2015	0	0	0	12	46	25	47	101	**234**	48	110	138			
	2016	10	159	0	31	73	-	-	-	-	-	-	-			
	2017	-	-	7	75	51	42	31	105	33	31	**173**	95			
	2018	25	148	7	-	-	-	-	-	-	-	-	-			
Shelduck	2014	-	-	-	-	-	-	-	-	-	-	-	41	147	290	138
	2015	**175**	140	127	158	59	26	79	35	25	54	69	**101**			
	2016	86	65	74	72	47	-	-	-	-	-	-	-			
	2017	-	-	77	85	37	29	55	40	49	45	61	97			
	2018	70	71	87-	-	-	-	-	-	-	-	-	-			

Notes:
- = no survey
*Five year mean peak counts for the period 1995/96 – 1999/00 (I-WeBS) except for light-bellied brent goose (Robinson et al., 2004).
**Five year mean peak for the period 2005/06 – 2009/10 (I-WeBS).
***Two year mean peak based on collected data (underlined and emboldened by species).

Table A10.2: Estuarine walkover peak monthly population estimates for bird species listed as Special Conservation Interests (SCIs) on Baldoyle Bay SPA citation

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
Black-tailed godwit	2014	-	-	-	-	-	-	-	-	-	-	-	33	72	204	166
	2015	74	91	**145**	8	30	7	33	6	62	52	78	115			
	2016	61	77	61	29	16	-	-	-	-	-	-	-			
	2017	-	-	116	12	34	6	30	10	47	58	121	92			
	2018	42	100	**187**	-	-	-	-	-	-	-	-	-			
Curlew	2014	-	-	-	-	-	-	-	-	-	-	-	16	61	204	164
	2015	12	28	58	34	36	31	60	58	**238**	93	125	49			
	2016	26	**90**	40	12	12	-	-	-	-	-	-	-			
	2017	-	-	35	12	30	17	31	36	78	37	71	45			
	2018	21	42	31	-	-	-	-	-	-	-	-	-			
Dunlin	2014	-	-	-	-	-	-	-	-	-	-	-	81	879	185	525
	2015	109	393	279	24	166	0	32	98	623	409	472	**618**			
	2016	140	359	244	74	36	-	-	-	-	-	-	-			
	2017	-	-	197	72	99	0	46	148	120	234	335	**431**			
	2018	72	253	199	-	-	-	-	-	-	-	-	-			
Great crested grebe	2014	-	-	-	-	-	-	-	-	-	-	-	0	42	29	44
	2015	0	0	2	3	0	0	0	0	0	12	**55**	17			
	2016	10	37	9	11	1	-	-	-	-	-	-	-			
	2017	-	-	30	18	0	0	0	0	12	14	17	10			
	2018	11	**32**	30	-	-	-	-	-	-	-	-	-			
Greenshank	2014	-	-	-	-	-	-	-	-	-	-	-	1	11	20	20
	2015	1	1	**14**	4	0	1	1	7	5	5	5	9			

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
	2016	3	6	9	2	0	-	-	-	-	-	-	-			
	2017	-	-	8	3	0	0	2	3	**25**	6	7	8			
	2018	3	6	8	-	-	-	-	-	-	-	-	-			
Grey heron	2014	-	-	-	-	-	-	-	-	-	-	-	1	16	16	15
	2015	2	1	4	5	5	6	6	11	11	11	16	**17**			
	2016	10	14	5	8	8	-	-	-	-	-	-	-			
	2017	-	-	5	7	8	6	6	8	10	10	**12**	7			
	2018	8	9	8	-	-	-	-	-	-	-	-	-			
Knot	2014	-	-	-	-	-	-	-	-	-	-	-	0	115	111	126
	2015	0	**102**	47	0	0	0	0	0	0	4	0	8			
	2016	6	**150**	56	0	0	-	-	-	-	-	-	-			
	2017	-	-	32	0	0	0	5	0	0	12	12	8			
	2018	0	79	32	-	-	-	-	-	-	-	-	-			
Lapwing	2014	-	-	-	-	-	-	-	-	-	-	-	387	450	365	534
	2015	295	236	12	6	7	9	8	9	15	305	446	336			
	2016	**607**	512	71	26	7	-	-	-	-	-	-	-			
	2017	**-**	-	113	37	6	10	4	23	121	143	231	368			
	2018	424	**461**	256	-	-	-	-	-	-	-	-	-			
Mallard	2014	-	-	-	-	-	-	-	-	-	-	-	114	46	212	185
	2015	**154**	146	116	56	56	45	110	96	**215**	111	103	164			
	2016	99	78	75	85	68	-	-	-	-	-	-	-			
	2017	-	-	108	73	90	68	104	97	100	105	75	110			

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
	2018	123	108	108	-	-	-	-	-	-	-	-	-			
Oystercatcher	2014	-	-	-	-	-	-	-	-	-	-	-	49	531	837	739
	2015	120	218	**758**	692	242	369	144	168	**719**	273	361	317			
	2016	197	216	320	257	96	-	-	-	-	-	-	-			
	2017	-	-	181	171	162	95	118	174	217	168	221	305			
	2018	108	163	173	-	-	-	-	-	-	-	-	-			
Pintail	2014	-	-	-	-	-	-	-	-	-	-	-	0	22	26	1
	2015	**2**	0	0	0	0	0	0	0	0	0	0	0			
	2016	0	0	0	0	0	-	-	-	-	-	-	-			
	2017	-	-	0	0	0	0	0	0	0	0	0	0			
	2018	0	0	0	-	-	-	-	-	-	-	-	-			
Red-breasted merganser	2014	-	-	-	-	-	-	-	-	-	-	-	0	14	17	26
	2015	1	1	7	5	0	0	0	10	16	28	**30**	15			
	2016	18	18	12	9	8	-	-	-	-	-	-	-			
	2017	-	-	12	**22**	2	0	0	2	5	8	18	8			
	2018	12	8	12	-	-	-	-	-	-	-	-	-			
Redshank	2014	-	-	-	-	-	-	-	-	-	-	-	23	224	314	294
	2015	40	111	126	110	2	17	22	113	167	257	303	**334**			
	2016	111	146	137	61	7	-	-	-	-	-	-	-			
	2017	-	-	105	54	8	9	67	57	207	87	142	**254**			
	2018	82	100	105	-	-	-	-	-	-	-	-	-			
Sanderling	2014	-	-	-	-	-	-	-	-	-	-	-	0	26	21	50

Species	Year	J	F	M	A	M	J	J	A	S	O	N	D	Original SPA Citation*	Five Year Peak Mean**	Two Year Peak Mean***
	2015	0	14	2	0	0	0	0	0	0	11	18	0			
	2016	0	16	**45**	8	0	-	-	-	-	-	-	-			
	2017	-	-	30	33	0	0	0	0	0	0	**55**	34			
	2018	0	0	30	-	-	-	-	-	-	-	-	-			
Teal	2014	-	-	-	-	-	-	-	-	-	-	-	161	124	238	328
	2015	194	146	192	52	5	11	45	36	198	110	111	248			
	2016	172	**367**	144	46	43	-	-	-	-	-	-	-			
	2017	-	**-**	96	47	8	6	46	46	46	87	133	156			
	2018	111	**288**	96	-	-	-	-	-	-	-	-	-			
Turnstone	2014	-	-	-	-	-	-	-	-	-	-	-	1	43	77	74
	2015	1	2	12	15	0	5	0	11	51	28	40	**74**			
	2016	19	38	62	32	0	-	-	-	-	-	-	-			
	2017	-	-	**74**	30	0	12	8	9	22	30	29	71			
	2018	17	28	74	-	-	-	-	-	-	-	-	-			

Notes:
- = no survey
*Five year mean peak counts for the period 1995/96 – 1999/00 (I-WeBS) with the exception of light-bellied brent goose (Robinson et al., 2004).
**Five year mean peak for the period 2005/06 – 2009/10 (I-WeBS).
***Two year mean peak based on collected data (underlined and emboldened by species).

Table A10.3: Estuarine walkover peak monthly population estimates for other bird species (non-SCI) listed on Baldoyle Bay SPA citation

Species	Category	J	F	M	A	M	J	J	A	S	O	N	D
Black guillemot**	Auks	2	2	2	4	2	2	2	2	2	4	2	2
Guillemot*,****		2	4	0	1	0	2	2	6	1	9	3	20
Razorbill*,****		2	2	0	1	6	1	5	2	2	4	2	2
Great northern diver	Divers	3	3	1	1	0	0	0	0	0	1	6	2
Red-throated diver		3	3	16	7	1	0	0	0	3	16	9	14
Canada goose	Geese and Swans	73	0	0	0	0	0	0	0	0	35	0	0
Mute swan		6	7	13	5	5	13	13	15	10	9	10	12
Pink-footed goose		0	0	1	0	0	0	0	0	0	0	0	0
Black-necked grebe	Grebes, Ducks and Rails	0	0	0	0	0	0	0	0	0	0	14	0
Common scoter		85	70	196	75	73	0	0	43	22	51	233	85
Coot		2	2	0	4	3	1	2	0	1	1	1	0
Eider		0	0	0	3	0	0	0	0	0	3	0	0
Goldeneye		8	0	0	0	0	0	0	0	0	0	0	0
Little grebe		1	1	4	2	1	5	4	4	1	2	2	1
Long-tailed duck		4	3	0	2	0	0	0	0	0	0	0	0
Moorhen		8	8	10	12	7	6	4	4	8	9	6	6
Shoveler		0	0	0	0	0	0	0	2	0	0	2	2
Tufted duck		1	1	0	0	0	0	1	1	1	0	1	0
Wigeon		138	166	67	25	0	4	0	16	16	124	228	257
Black-headed gull	Gulls	112	203	93	110	68	66	80	155	404	332	306	224
Common gull		58	84	26	53	34	10	10	9	28	34	53	54
Great black-backed gull**		6	27	24	26	27	32	28	14	69	27	10	18
Herring gull*		84	181	111	131	154	292	167	114	331	216	190	95

Species	Category	J	F	M	A	M	J	J	A	S	O	N	D
Kittiwake*.***		2	1	6	0	0	0	0	0	0	0	3	0
Lesser black-backed gull		12	3	24	29	26	46	42	25	17	13	23	2
Mediterranean gull		0	2	0	0	0	0	4	3	4	1	2	0
Ring-billed gull		1	0	1	0	0	0	0	0	0	0	1	0
Blue tit	Other	0	1	0	0	0	0	0	0	0	0	0	0
Fulmar		0	0	0	0	0	0	0	0	0	0	0	1
Hooded crow		0	0	0	0	4	0	0	0	0	0	0	0
Kingfisher		0	0	0	0	0	0	0	0	0	0	0	1
Mistle thrush		0	0	1	0	0	0	0	0	0	0	0	0
Little egret		8	7	11	11	12	9	9	9	20	13	13	10
Pheasant		0	0	0	0	1	0	0	0	0	0	0	0
Red-legged partridge		0	1	0	0	0	0	0	0	0	0	0	0
Snow bunting		0	0	0	6	0	0	0	0	0	0	0	0
Song thrush		0	0	1	0	0	0	0	0	0	0	0	0
Stonechat		11	0	0	0	0	0	0	0	0	0	0	0
Wheatear		0	0	0	0	1	0	0	0	0	0	0	0
Buzzard	Raptors	1	2	2	3	3	1	1	1	0	1	1	1
Kestrel		1	1	1	1	1	0	1	2	1	0	0	0
Peregrine**.****		1	2	0	2	1	0	0	1	1	1	0	1
Sparrowhawk		1	0	1	0	0	0	0	0	1	1	1	1
Cormorant*	Shags and Cormorants	17	20	10	28	14	27	24	20	16	42	39	34
Shag**		3	8	6	7	6	5	7	7	10	11	10	2
Arctic tern	Terns	0	0	0	2	3	5	3	0	0	0	0	0

Species	Category	J	F	M	A	M	J	J	A	S	O	N	D
Black tern		0	0	0	0	0	0	0	2	0	0	0	0
Common tern		0	0	0	14	9	12	29	34	0	0	0	0
Roseate tern		0	0	0	0	1	2	4	11	7	0	0	0
Sandwich tern		0	0	4	9	15	5	15	10	42	0	0	0
Avocet		0	0	0	1	0	0	0	0	0	0	0	0
Common sandpiper		2	1	0	3	1	0	3	2	3	2	1	0
Snipe		7	35	5	6	1	0	0	2	4	5	3	6
Curlew sandpiper		0	0	0	0	0	0	0	0	0	3	6	0
Green sandpiper	Waders	0	0	0	0	0	0	1	0	0	0	0	0
Purple sandpiper		0	0	2	0	0	0	0	0	0	0	0	0
Ruff		0	1	0	0	0	0	4	7	8	2	0	0
Little stint		0	0	0	0	0	0	0	1	0	0	0	0
Whimbrel		0	0	62	53	76	3	5	5	4	5	6	0

Notes:
* SCI of Ireland's Eye SPA.
** Named bird species of Ireland's Eye SPA.
*** SCI of Howth Head Coast SPA.
**** Named bird species of Howth Head Coast SPA.

Table A10.4: Estuarine walkover peak monthly population estimates for bird species not listed on Baldoyle Bay SPA citation

APPENDIX 3 – MARINE VP SURVEY EFFORT

Date	VP ID	Surveyor*	Start Time	Finish Time	Survey Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**
19/12/2014	2	AMcC	10:15	13:15	03:00	2.21	3.17	4.00	1.79	T
22/12/2014	1	AMcC	12:25	15:25	03:00	1.90	3.30	4.55	2.65	T
08/01/2015	2	AMcC	09:10	12:25	03:15	2.48	3.59	4.44	1.96	H
12/01/2015	1	AMcC	10:00	13:00	03:00	2.48	3.04	3.69	1.21	H
19/01/2015	1	AMcC	08:45	11:45	03:00	4.12	4.41	4.56	0.44	H
19/01/2015	2	AMcC	12:55	15:55	03:00	1.10	1.89	3.08	1.98	L
18/02/2015	2	KM	08:30	11:30	03:00	3.92	4.51	4.76	0.84	H
18/02/2015	1	KM	13:30	16:30	03:00	0.72	1.56	2.96	2.24	L
25/02/2015	2	KM	08:30	11:30	03:00	1.24	1.41	1.76	0.52	L
25/02/2015	1	KM	13:30	16:30	03:00	2.99	3.74	4.20	1.21	H
05/03/2015	2	NV	09:00	12:00	03:00	3.42	4.11	4.42	1	H
05/03/2015	1	NV	14:00	17:00	03:00	0.95	1.84	3.14	2.19	L
23/03/2015	2	NV	09:00	12:00	03:00	2.04	3.45	4.57	2.53	T
23/03/2015	1	NV	14:00	17:00	03:00	2.01	3.63	4.81	2.8	T
02/04/2015	2	NV	08:30	11:30	03:00	3.65	4.09	4.28	0.63	H
02/04/2015	1	NV	13:30	16:30	03:00	1.10	1.64	2.65	1.55	L
08/04/2015	2	NV	08:00	11:00	03:00	1.15	2.09	3.16	2.01	L
08/04/2015	1	NV	13:00	16:00	03:00	3.23	3.95	4.23	1	H
19/05/2015	1	NV	05:30	08:30	03:00	0.83	1.55	2.73	1.9	L
19/05/2015	2	NV	10:00	13:00	03:00	3.92	4.47	4.70	0.78	H
28/05/2015	2	NV	09:00	12:00	03:00	1.95	2.78	3.59	1.64	L
28/05/2015	1	NV	14:00	17:00	03:00	1.64	2.18	2.88	1.24	L
16/06/2015	2	NV	10:00	13:00	03:00	3.70	4.26	4.48	0.78	H
16/06/2015	1	NV	15:00	18:00	03:00	0.98	1.22	1.82	0.84	L
29/06/2015	2	NV	08:00	11:00	03:00	3.59	3.93	4.09	0.5	H
29/06/2015	1	NV	13:00	16:00	03:00	1.38	1.63	2.24	0.86	L
07/07/2015	1	NV	07:00	10:00	03:00	1.06	1.29	1.83	0.77	L
07/07/2015	2	NV	12:00	15:00	03:00	2.85	3.78	4.46	1.61	H
13/07/2015	1	NV	07:30	10:30	03:00	3.83	4.23	4.40	0.57	H
13/07/2015	2	NV	12:30	15:30	03:00	1.48	1.90	2.77	1.29	L
04/08/2015	2	NV	08:00	11:00	03:00	1.08	2.03	3.21	2.13	L
04/08/2015	1	NV	13:00	16:00	03:00	3.98	4.56	4.79	0.81	H
24/08/2015	2	NV	07:00	10:00	03:00	2.36	3.14	3.83	1.47	H
24/08/2015	1	NV	12:15	15:15	03:00	2.02	2.48	3.09	1.07	L
09/09/2015	1	NV	07:00	10:00	03:00	3.42	3.82	3.99	0.57	H
09/09/2015	2	NV	14:45	17:45	03:00	1.66	2.09	2.77	1.11	L
30/09/2015	1	NV	07:15	10:15	03:00	0.92	2.27	3.61	2.69	L
30/09/2015	2	NV	11:10	14:10	03:00	4.10	4.50	4.70	0.6	H

Date	VP ID	Surveyor*	Start Time	Finish Time	Survey Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**
01/10/2015	1	NV	08:00	11:00	03:00	1.02	2.32	3.59	2.57	L
01/10/2015	2	NV	13:00	16:00	03:00	4.00	4.44	4.63	0.63	H
22/10/2015	2	NV	11:45	14:45	03:00	2.04	2.33	2.83	0.79	L
22/10/2015	1	NV	15:30	18:30	03:00	3.20	3.77	4.16	0.96	H
05/11/2015	2	NV	08:00	11:00	03:00	2.65	3.28	3.88	1.23	H
06/11/2015	1	NV	12:10	15:10	03:00	2.26	2.41	2.66	0.4	L
23/11/2015	1	NV	07:45	10:45	03:00	3.84	4.29	4.47	0.63	H
23/11/2015	2	NV	11:30	14:30	03:00	1.26	2.01	3.19	1.93	L
03/12/2015	1	NV	09:00	12:00	03:00	2.06	2.19	2.45	0.39	L
04/12/2015	2	NV	10:00	13:00	03:00	2.23	2.33	2.53	0.3	L
09/12/2015	1	NV	10:30	13:30	03:00	2.76	3.79	4.46	1.7	H
10/12/2015	2	NV	09:30	12:30	03:00	3.83	4.31	4.50	0.67	H
15/12/2015	1	NV	09:00	12:00	03:00	2.03	3.17	4.22	2.19	T
16/12/2015	2	NV	09:30	12:30	03:00	1.99	3.02	4.06	2.07	T
06/01/2016	1	NV	09:00	12:00	03:00	3.01	3.77	4.24	1.23	H
08/01/2016	2	NV	10:00	13:00	03:00	3.35	4.28	4.73	1.38	H
19/01/2016	1	NV	09:00	12:00	03:00	1.79	2.68	3.66	1.87	L
23/01/2016	2	NV	10:00	13:00	03:00	3.77	4.39	4.65	0.88	H
06/02/2016	1	NV	13:45	16:45	03:00	1.78	2.05	2.64	0.86	L
10/02/2016	2	NV	12:30	15:30	03:00	2.87	4.22	4.93	2.06	H
17/02/2016	2	NV	11:00	14:00	03:00	1.54	1.71	2.07	0.53	L
18/02/2016	1	NV	10:30	13:30	03:00	1.56	2.30	3.27	1.71	L
08/03/2016	1	NV	09:00	12:00	03:00	4.24	4.68	4.87	0.63	H
15/03/2016	2	NV	14:30	17:30	03:00	3.48	3.95	4.14	0.66	H
18/03/2016	1	NV	12:00	15:00	03:00	1.40	1.56	1.99	0.59	L
21/03/2016	2	NV	14:30	17:30	03:00	1.04	1.26	1.82	0.78	L
04/04/2016	1	NV	08:00	11:00	03:00	3.55	4.19	4.43	0.88	H
04/04/2016	2	NV	13:30	16:30	03:00	1.38	1.55	1.90	0.52	L
12/04/2016	2	NV	12:00	15:00	03:00	3.01	3.93	4.55	1.54	H
17/04/2016	1	NV	07:30	10:30	03:00	3.49	3.97	4.14	0.65	H
04/05/2016	2	NV	13:00	16:00	03:00	1.03	1.29	1.96	0.93	L
09/05/2016	1	NV	06:30	09:30	03:00	0.78	1.55	2.79	2.01	L
25/05/2016	1	NV	15:00	18:00	03:00	1.67	2.81	3.91	2.24	T
26/05/2016	2	NV	14:30	17:30	03:00	2.58	3.57	4.19	1.61	H
14/06/2016	1	NV	06:30	09:30	03:00	3.15	3.79	4.08	0.93	H
14/06/2016	2	NV	12:30	15:30	03:00	1.70	1.97	2.50	0.8	L
30/06/2016	1	NV	05:00	08:00	03:00	3.69	4.21	4.43	0.74	H
30/06/2016	2	NV	08:45	11:45	03:00	1.79	2.87	3.95	2.16	T
08/07/2016	2	NV	14:00	17:00	03:00	2.86	3.88	4.39	1.53	H
12/07/2016	2	NV	11:15	14:15	03:00	1.61	2.11	2.79	1.18	L
17/07/2016	2	NV	12:30	15:30	03:00	1.46	2.02	2.92	1.46	L
22/07/2016	2	NV	11:00	14:00	03:00	3.76	4.27	4.48	0.72	H
15/03/2017	1	NV	06:40	09:40	03:00	0.84	1.53	2.61	1.77	L

Date	VP ID	Surveyor*	Start Time	Finish Time	Survey Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**
15/03/2017	2	NV	12:00	15:00	03:00	3.87	4.34	4.53	0.66	H
29/03/2017	2	NV	06:40	09:40	03:00	1.19	2.48	3.80	2.61	T
29/03/2017	1	NV	12:00	15:00	03:00	3.00	4.31	5.02	2.02	H
20/04/2017	1	NV	06:45	09:45	03:00	2.21	2.93	3.56	1.35	T
20/04/2017	2	NV	11:00	14:00	03:00	1.66	1.80	2.12	0.46	L
27/04/2017	1	NV	06:15	09:15	03:00	0.99	2.31	3.69	2.7	L
27/04/2017	2	NV	12:55	15:55	03:00	1.40	3.00	4.45	3.05	T
08/05/2017	1	NV	05:40	08:40	03:00	2.21	3.30	3.96	1.75	T
08/05/2017	2	NV	12:40	15:40	03:00	1.06	1.84	2.97	1.91	L
17/05/2017	1	NV	11:20	14:20	03:00	2.67	3.23	3.75	1.08	H
17/05/2017	2	NV	15:20	18:20	03:00	3.19	3.77	4.03	0.84	H
12/06/2017	2	NV	12:40	15:40	03:00	3.19	3.96	4.30	1.11	H
12/06/2017	1	NV	16:30	19:30	03:00	1.29	1.63	2.43	1.14	L
27/06/2017	2	NV	08:15	11:15	03:00	1.15	2.30	3.51	2.36	L
27/06/2017	1	NV	12:05	15:02	02:57	4.12	4.56	4.76	0.64	H
20/07/2017	2	NV	07:45	10:45	03:00	3.26	4.00	4.34	1.08	H
20/07/2017	1	NV	11:30	14:30	03:00	1.29	1.75	2.63	1.34	L
27/07/2017	1	NV	07:30	10:30	03:00	0.92	1.48	2.50	1.58	L
27/07/2017	2	NV	11:30	14:30	03:00	3.30	4.16	4.64	1.34	H
17/08/2017	1	NV	08:50	11:50	03:00	1.81	2.63	3.57	1.77	T
17/08/2017	2	NV	12:35	15:35	03:00	1.66	1.98	2.56	0.91	L
29/08/2017	2	NV	10:05	13:05	03:00	1.72	2.05	2.62	0.91	L
29/08/2017	1	NV	13:45	16:45	03:00	3.00	3.57	3.94	0.95	H
06/09/2017	2	NV	08:40	11:40	03:00	3.25	4.00	4.42	1.18	H
06/09/2017	1	NV	12:20	15:20	03:00	1.94	3.19	4.23	2.3	T
21/09/2017	1	NV	12:15	15:15	03:00	2.52	3.80	4.63	2.12	T
21/09/2017	2	NV	15:45	18:45	03:00	1.02	1.26	1.90	0.89	L
25/10/2017	2	NV	12:40	15:40	03:00	3.81	4.14	4.27	0.47	H
25/10/2017	1	NV	16:05	19:05	03:00	2.10	3.03	3.93	1.84	T
31/10/2017	1	NV	07:00	10:00	03:00	3.64	3.89	4.03	0.4	H
31/10/2017	2	NV	13:45	16:45	03:00	1.85	2.12	2.69	0.85	L
27/11/2017	1	NV	08:15	11:15	03:00	2.04	2.46	3.10	1.07	T
29/11/2017	1	NV	13:05	16:05	03:00	1.67	1.98	2.56	0.9	L
30/11/2017	2	NV	12:50	15:50	03:00	1.49	1.62	1.94	0.46	L
04/12/2017	1	NV	08:25	11:25	03:00	3.18	4.13	4.71	1.54	H
18/12/2017	2	NV	13:00	16:00	03:00	1.66	2.81	3.97	2.32	T
28/12/2017	1	NV	08:20	11:20	03:00	2.13	2.88	3.68	1.56	T
28/12/2017	2	NV	12:20	15:20	03:00	1.84	2.16	2.76	0.93	T
10/01/2018	1	NV	08:20	11:20	03:00	2.04	2.68	3.52	1.49	T
10/01/2018	2	NV	11:55	14:55	03:00	1.94	2.29	2.85	0.92	T
24/01/2018	2	NV	08:30	11:30	03:00	2.18	2.37	2.78	0.61	T
24/01/2018	1	NV	12:05	15:05	03:00	3.15	3.86	4.48	1.34	H
05/02/2018	1	NV	09:15	12:15	03:00	1.23	2.25	3.35	2.13	T

Date	VP ID	Surveyor*	Start Time	Finish Time	Survey Effort	Minimum Tide (m)	Mean Tide (m)	Maximum Tide (m)	Survey Tidal Range (m)	Survey Tidal State**
05/02/2018	2	NV	13:00	16:00	03:00	3.86	4.33	4.52	0.67	H
22/02/2018	1	NV	07:30	10:30	03:00	1.28	1.44	1.80	0.53	L
22/02/2018	2	NV	11:20	14:20	03:00	2.17	3.12	3.96	1.8	T
15/03/2018	1	NV	06:40	09:40	03:00	3.00	3.95	4.69	1.7	H
15/03/2018	2	NV	12:00	15:00	03:00	1.98	3.15	4.32	2.35	T
29/03/2018	2	NV	06:40	09:40	03:00	3.07	3.95	4.56	1.5	H
29/03/2018	1	NV	12:00	15:00	03:00	1.05	2.21	3.60	2.56	T

Notes:

* Surveyors: AMcC = Adam McClure, KM = Kevin Mawhinney, NV= Nick Veale.

** Tidal state for each survey is designated as follows. Surveys designated as 'high tide' (H) when survey mean tide >= mid height of the tide AND survey min tide >= highest low tide. Surveys designated as 'low tide'(L) when survey mean tide < the mid height of the tide AND survey max tide < lowest high tide. All other surveys are designate 'through the tide' 'T'

Table A10.5: Coastal and marine VP survey effort December 2014 to March 2018

APPENDIX 4 – MARINE VP RECORDS

Species	Ireland's Eye SPA	Howth Head Coast SPA	Number of Surveys Species Present (74 Surveys Total)	Total Number of Individuals Encountered on Sea During VP Surveys	Total Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Guillemot	SCI	Yes	60	1084	750	216	364	465	March
Razorbill	SCI	Yes	62	1557	771	388	188	453	March
Guillemot or razorbill	SCI	Yes	39	1089	218	400	33	424	October
Kittiwake	SCI	SCI	60	1207	1000	145	186	310	October
Herring gull	SCI	No	75	3709	1932	177	119	239	February
Fulmar	Yes	Yes	55	336	741	76	83	159	December
Great black-backed gull	Yes	No	74	746	746	61	43	97	February
Cormorant	SCI	No	73	476	472	47	34	69	January
Gannet	Yes	No	48	277	354	19	42	60	February
Shag	Yes	No	71	783	365	41	12	47	September
Cormorant or shag	Yes	No	3	31	3	29	3	29	October
Black guillemot	Yes	No	59	208	96	22	6	22	October
Peregrine	Yes	Yes	15	0	24	0	4	4	October
Puffin	Yes	No	4	2	4	1	2	2	March

Table A10.6: Frequency and number of species encounters and on sea/in flight/total peak counts from VP surveys during winter/passage season (species name**d in Ireland's Eye** and/or Howth Head Coast SPA citations), sorted by peak VP count

Species	Baldoyle Bay SPA Citation Status	Number of Surveys Species Present (74 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Great crested grebe	Yes	46	1846	32	253	3	255	March
Oystercatcher	Yes	63	1383	912	187	109	210	January
Sanderling	Yes	17	453	230	82	51	105	December
Dunlin	Yes	9	146	235	80	100	100	January
Red-breasted merganser	Yes	39	456	99	72	18	90	March
Turnstone	Yes	16	203	70	33	19	44	March
Brent goose (LB)	SCI	39	107	569	39	39	39	February
Redshank	Yes	5	84	4	36	4	36	January
Ringed plover	SCI	5	0	89	0	21	21	March
Curlew	Yes	18	49	61	13	11	16	November
Lapwing	Yes	1	0	15	0	15	15	February
Bar-tailed godwit	SCI	3	27	0	14	0	14	October
Black-tailed godwit	Yes	1	0	12	0	12	12	November
Shelduck	SCI	3	9	8	9	4	9	November
Grey heron	Yes*	10	2	14	1	6	7	December
Mallard	Yes	1	0	2	0	2	2	February

Notes

*Listed as 'other important species' of Baldoyle Bay SPA.

Table A10.7: Frequency and number of species encounters and on sea/in flight/total peak counts from VP surveys during winter/passage season (species named in Baldoyle Bay SPA citation), sorted by peak VP count

Species	Number of Surveys Species Present (74 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Common scoter	64	5616	696	443	53	478	January
Black-headed gull	55	1759	753	121	102	223	October
Canada goose	2	204	3	203	3	203	January
Red-throated diver	63	617	73	112	5	112	March
Sandwich tern	8	77	89	37	23	58	September
Pink-footed goose	1	0	49	0	49	49	March
Whimbrel	4	3	80	3	38	38	March
Manx shearwater	1	0	35	0	35	35	September
Bar-tailed godwit	5	71	0	25	0	25	October
Lesser black-backed gull	28	97	33	18	7	25	November
Common gull	36	135	66	22	7	23	November
Common or Arctic tern	1	0	23	0	23	23	September
Swallow	2	0	36	0	18	18	March
Goldcrest	1	11	0	11	0	11	March
Great northern diver	37	85	9	8	2	9	December
Black-throated diver	6	11	0	5	0	5	February
Common tern	1	2	3	2	3	5	September
Common eider	1	4	0	4	0	4	December
Little grebe	2	0	8	0	4	4	March
Long-tailed duck	5	12	0	4	0	4	January
Purple sandpiper	2	0	8	0	4	4	March
Mediterranean gull	4	5	2	2	1	2	September
Blackbird	1	0	2	0	2	2	November
Ring-billed gull	1	2	0	2	0	2	March
Slavonian grebe	1	2	0	2	0	2	March
Arctic skua	1	0	1	0	1	1	September
Black-necked grebe	1	1	0	1	0	1	March

Table A10.8: Frequency and number of species encounters and on sea/in flight/total peak counts from VP surveys during winter/passage season (non-SPA species), sorted by peak VP count

Species	Number of Surveys Species Present (74 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Unidentified gull	3	205	0	142	0	142	January
Unidentified wader	4	28	0	24	0	31	November

Table A10.9: Number of partially identified bird encounters and on sea/in flight/total peak counts from VP surveys during winter/passage season, sorted by peak VP count

Species	Ireland's Eye SPA	Howth Head Coast SPA	Number of Surveys Species Present (56 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Guillemot	SCI	Yes	51	7882	4541	1051	462	1513	June
Razorbill	SCI	Yes	55	6683	3571	705	333	1038	May
Kittiwake	SCI	SCI	56	2988	1773	477	87	557	May
Guillemot or razorbill	Yes	Yes	38	795	534	184	161	244	July
Gannet	Yes	No	54	1055	1268	143	133	225	June
Herring Gull	SCI	No	56	3070	1889	129	86	185	June
Puffin	Yes	No	33	740	322	151	55	173	June
Shag	Yes	No	56	1208	1075	60	84	129	July
Great Black-backed Gull	Yes	No	56	692	905	32	66	87	June
Cormorant	SCI	No	56	501	791	37	49	63	June
Fulmar	Yes	Yes	51	197	516	23	40	63	May
Black Guillemot	Yes	No	51	204	114	10	6	14	June
Peregrine	Yes	Yes	18	0	18	0	2	2	May, July
Cormorant or shag	Yes	No	4	3	1	1	1	1	May, July, August

Table A10.10: Frequency and number of species encounters from VP **surveys during breeding season (species named in Ireland's Eye/Howth Head Coast SPA cita**tions), sorted by peak VP count

Species	Baldoyle Bay SPA Citation Status	Number of Surveys Species Present (56 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Oystercatcher	Yes	49	805	357	128	38	145	May
Ringed Plover	SCI	9	136	73	38	32	70	June
Red-breasted Merganser	Yes	15	117	22	37	7	44	August
Dunlin	Yes	4	80	37	40	26	40	June
Black-tailed Godwit	Yes	1	0	37	0	37	37	July
Curlew	Yes	9	21	20	7	10	16	August
Redshank	Yes	2	7	16	7	16	16	April
Great Crested Grebe	Yes	7	55	5	14	2	15	April
Shelduck	SCI	19	13	69	4	14	14	July
Brent Goose (light-bellied)	SCI	3	0	30	0	24	13	April
Turnstone	Yes	4	8	28	8	12	12	July
Bar-tailed Godwit	Yes	1	1	0	1	0	1	May
Grey Heron	Yes*	8	1	6	1	1	1	April, May, June, July, August

Notes

*Listed as 'other important species' of Baldoyle Bay SPA.

Table A10.11: Frequency and number of species encounters from VP surveys during breeding season (species named in Baldoyle Bay SPA citation), sorted by peak VP count

Species	Number of Surveys Species Present (56 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Black-headed gull	42	757	501	96	60	156	August
Manx shearwater	29	318	637	53	100	128	August
Common scoter	16	445	57	119	18	124	August
Common tern	23	123	435	17	94	109	August
Red-throated diver	13	122	13	52	3	52	April
Common gull	42	176	113	38	10	40	June

Species	Number of Surveys Species Present (56 Surveys Total)	Number of Individuals Encountered on Sea During VP Surveys	Number of Individuals Encountered in Flight During VP Surveys	Peak VP Count (Birds on Sea in a Single Survey)	Peak VP Count (Birds in Flight in a Single Survey)	Peak VP Count (All Birds in a Single Survey)	Peak VP Month
Sandwich tern	49	295	455	19	32	37	May
Common or Arctic tern	26	84	185	18	17	24	June
Lesser black-backed gull	48	119	92	12	7	14	May
Tufted duck	2	0	20	0	11	14	June
Whimbrel	5	7	18	4	11	11	April
Little tern	2	1	10	1	10	10	August
Mediterranean gull	3	2	12	2	10	10	July
Common eider	2	16	0	8	0	8	April
Roseate tern	7	3	15	2	8	8	August
Long-tailed duck	1	6	0	6	0	6	April
Mute swan	1	0	4	0	4	4	July
Arctic tern	8	4	12	2	3	3	May, June
Great skua	9	2	13	1	3	3	June, August
Kestrel	7	3	4	3	3	3	June
Blackbird	1	0	2	0	2	2	April
Feral pigeon	4	0	8	0	2	2	May, June
Greenfinch	2	1	2	1	2	2	July
Sparrowhawk	1	0	2	0	2	2	June
Arctic skua	4	0	4	0	1	1	July, August
Little stint	1	0	1	0	1	1	July
Great northern diver	1	1	0	1	0	1	August
Ring-billed gull	1	1	0	1	0	1	July
Storm petrel	1	0	1	0	1	1	May

Table A10.12: Frequency and number of species encounters and on sea/in flight/total peak counts from VP surveys during breeding season (non-SPA species), sorted by peak VP count

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	2	0	2
	DP	0	0	55	95	150
	FE	0	0	7	0	7
	LO	0	15	85	219	319
	PL	0	0	0	2	2
	RO	0	4	15	29	48
	SF	0	0	5	0	5
	SU	0	0	3	32	35
	Total	**0**	**19**	**172**	**377**	**568**
2	-	0	0	17	7	24
	DP	98	32	156	187	473
	FE	0	0	0	12	12
	LO	132	1176	940	564	2812
	PR	5	16	0	1	22
	RO	15	30	54	58	157
	SC	0	2	0	0	2
	SF	0	20	25	41	86
	SU	0	6	15	18	39
	Total	**250**	**1282**	**1207**	**888**	**3627**
Grand Total		**250**	**1301**	**1379**	**1265**	**4195**

Table A10.13: Kittiwake behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	1	4	3	8
	FE	4	41	257	157	459
	LO	1	38	126	135	300
	PR	0	5	8	0	13
	Total	**5**	**85**	**395**	**295**	**780**
2	-	74	63			137
	FE	46	271	581	253	1151
	LO	4150	1331	795	278	6554
	PL	0	0	0	1	1
	PR	122	27	6	0	155
	RO	181	7	0	0	188
	Total	**4573**	**1699**	**1382**	**532**	**8186**
Grand Total		**4578**	**1784**	**1777**	**827**	**8966**

Table A10.14: Guillemot behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	0	6	6
	FE	4	55	187	314	560
	LO	1	15	62	129	207
	PR	0	5	8	5	18
	Total	**5**	**75**	**257**	**454**	**791**
2	-	52	18			70
	FE	26	233	490	231	980
	LO	3900	1177	659	190	5926
	PR	139	53	9	7	208
	RO	223	42	0	0	265
	Total	**4340**	**1523**	**1158**	**428**	**7449**
Grand Total		**4345**	**1598**	**1415**	**882**	**8240**

Table A10.15: Razorbill behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	13	6	5	42	66
	DP			35	83	118
	FE				5	5
	LO	184	381	324	225	1114
	PR	10	3	0	2	15
	RL	40	26	65	84	215
	RO	394	374	527	443	1738
	SC	0	12	8	12	32
	SF	0	0	22	56	78
	SU	10	1	3	5	19
	Total	**651**	**803**	**989**	**957**	**3400**
2	-	28	12	6	7	53
	FE	10	1	0	6	17
	LO	970	590	205	182	1947
	PR	182	46	0	0	228
	RL	137	22	0	0	159
	RO	349	160	29	15	553
	SC	18	27	4	28	77
	SF	0	70	138	81	289
	SU	15	2	11	28	56
	Total	**1709**	**930**	**393**	**347**	**3379**
Grand Total		**2360**	**1733**	**1382**	**1304**	**6779**

Table A10.16: Herring gull behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	2	0	0	0	2
	FE	36	100	77	43	256
	LO	0	1	0	0	1
	PR	79	59	50	84	272
	RL	0	0	6	2	8
	RO	27	0	8	10	45
	SU	0	0	0	1	1
	Total	**144**	**160**	**141**	**140**	**585**
2	-	0	2	0	1	3
	FE	34	54	49	62	199
	LO	3	1	0	9	13
	PL	1	0	0	0	1
	PR	100	26	0	0	126
	RL	50	0	0	0	50
	Total	**188**	**83**	**49**	**72**	**392**
Grand Total		**332**	**243**	**190**	**212**	**977**

Table A10.17: Cormorant behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	7	11	18
	FE	0	0	2	0	2
	LO	17	24	90	203	334
	PR	4	0	0	3	7
	RL	2	3	6	4	15
	RO	32	16	45	101	194
	SC	0	0	0	10	10
	SF	0	0	12	21	33
	SU	0	0	2	0	2
	Total	**55**	**43**	**164**	**353**	**615**
2	-	8	0	7	8	23
	FE	3	0	0	9	12
	LO	57	106	143	239	545
	PR	25	15	1	0	41
	RL	8	0	0	0	8
	RO	3	0	7	5	15
	SC	2	9	0	12	23
	SF	0	29	47	66	142
	SU	2	0	4	8	14
	Total	**108**	**159**	**209**	**347**	**823**
Grand Total		**163**	**202**	**373**	**700**	**1438**

Table A10.18: Great black-backed gull behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	0	1	1
	LO	0	0	8	40	48
	PR	0	0	0	4	4
	SU	0	0	0	1	1
	Total	**0**	**0**	**8**	**46**	**54**
2	-	1	0	4	1	6
	LO	73	88	100	72	333
	PR	20	15	3	0	38
	RO	1	49	43	6	99
	SU	0	0	0	3	3
	Total	**95**	**152**	**150**	**82**	**479**
Grand Total		**95**	**152**	**158**	**128**	**533**

Table A10.19: Fulmar behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	1	5	0	11	17
	CN	0	1	0	0	1
	FE	148	323	104	48	623
	LO	0	6	3	0	9
	PR	6	15	3	9	33
	RL	0	0	0	5	5
	RO	2	0	0	0	2
	Total	**157**	**350**	**110**	**73**	**690**
2	-	6	1	1	2	10
	FE	334	265	140	69	808
	LO	20	0	0	0	20
	PR	297	49	0	0	346
	RL	108	0	0	0	108
	RO	0	8	0	0	8
	SF	0	1	0	0	1
	Total	**765**	**324**	**141**	**71**	**1301**
Grand Total		**922**	**674**	**251**	**144**	**1991**

Table A10.20: Shag behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	LO	0	0	7	43	50
	PL	0	0	20	66	86
	RO	0	0	0	1	1
	Total	**0**	**0**	**27**	**110**	**137**
2	-	0	0	1	3	4
	DP	0	0	2	0	2
	FE	0	9	0	2	11
	LO	80	144	124	170	518
	PL	12	60	133	204	409
	PR	134	76	9	3	222
	RO	0	0	1	6	7
	SF	0	3	0	0	3
	SU	7	0	10	2	19
	Total	**233**	**292**	**280**	**390**	**1195**
Grand Total		**233**	**292**	**307**	**500**	**1332**

Table A10.21: Gannet behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	FE	0	0	3	5	8
	LO	0	0	2	5	7
	Total	**0**	**0**	**5**	**10**	**15**
2	-	6	0	2	0	8
	FE	0	7	8	4	19
	LO	547	138	8	0	693
	PR	5	2	0	0	7
	Total	**558**	**147**	**18**	**4**	**727**
Grand Total		**558**	**147**	**23**	**14**	**742**

Table A10.22: Puffin behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	2	1	0	3
	FE	6	42	57	59	164
	RL	0	0	0	22	22
	Total	**6**	**44**	**58**	**81**	**189**
2	-	3	9	0	0	12
	FE	74	96	34	7	211
	Total	**77**	**105**	**34**	**7**	**223**
Grand Total		**83**	**149**	**92**	**88**	**412**

Table A10.23: Black guillemot behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	3	1	11	1	16
	FE	107	451	166	26	750
	LO	8	459	99	122	688
	PR	4	159	104	6	273
	RO	0	0	2	4	6
	SU	0	0	0	1	1
	Total	**122**	**1070**	**382**	**160**	**1734**
2	FE	3	13	30	107	153
	PR	0	4	0	10	14
	Total	**3**	**17**	**30**	**117**	**167**
Grand Total		**125**	**1087**	**412**	**277**	**1901**

Table A10.24: Great crested grebe behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	11	0	0	0	11
	FE	121	78	13	97	309
	LO	11	0	0	12	23
	RL	74	16	46	121	257
	RO	554	100	182	689	1525
	Total	**771**	**194**	**241**	**919**	**2125**
2	-	2	0	0	0	2
	FE	20	0	0	0	20
	LO	0	2	0	0	2
	RL	8	0	0	0	8
	RO	31	0	0	0	31
	Total	**61**	**2**	**0**	**0**	**63**
Grand Total		**832**	**196**	**241**	**919**	**2188**

Table A10.25: Oystercatcher behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	FE	163	23	53	152	391
	RO	0	0	0	18	18
	SU	0	22	0	22	44
	Total	**163**	**45**	**53**	**192**	**453**
2	**Total**	**0**	**0**	**0**	**0**	**0**
Grand Total		**163**	**45**	**53**	**192**	**453**

Table A10.26: Sanderling behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	FE	8	0	0	86	94
	RO	22	0	12	98	132
	Total	**30**	**0**	**12**	**184**	**226**
2	**Total**	**0**	**0**	**0**	**0**	**0**
Grand Total		**30**	**0**	**12**	**184**	**226**

Table A10.27: Dunlin behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	4	17	0	21
	FE	24	349	70	12	455
	LO	3	7	6	29	45
	PR	0	17	22	0	39
	Total	**27**	**377**	**115**	**41**	**560**
2	ED	2	0	0	0	2
	FE	0	0	0	11	11
	Total	**2**	**0**	**0**	**11**	**13**
Grand Total		**29**	**377**	**115**	**52**	**573**

Table A10.28: Red-breasted merganser behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	0	12	12
	FE	6	22	0	12	40
	PR	0	0	0	11	11
	RO	53	0	33	36	122
	Total	**59**	**22**	**33**	**71**	**185**
2	RL	4	0	0	0	4
	RO	21	0	0	0	21
	Total	**25**	**0**	**0**	**0**	**25**
Grand Total		**84**	**22**	**33**	**71**	**210**

Table A10.29: Turnstone behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	FE	0	0	0	8	8
	RL	0	0	0	27	27
	RO	0	0	4	52	56
	Total	**0**	**0**	**4**	**87**	**91**
2	**Total**	**0**	**0**	**0**	**0**	**0**
Grand Total		**0**	**0**	**4**	**87**	**91**

Table A10.30: Redshank behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	7	0	0	0	7
	FE	11	7	8	19	45
	RO	60	8	16	0	84
	Total	**78**	**15**	**24**	**19**	**136**
2	**Total**	**0**	**0**	**0**	**0**	**0**
Grand Total		**78**	**15**	**24**	**19**	**136**

Table A10.31: Ringed plover behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	7	6	2	0	15
	DP	2	0	0	0	2
	LO	192	165	82	75	514
	PR	5	0	0	0	5
	RL	22	34	80	93	229
	RO	338	317	438	428	1521
	SC	0	4	8	0	12
	SF	0	0	2	20	22
	SU	7	0	4	9	20
	Total	**573**	**526**	**616**	**625**	**2340**
2	-	0	1	0	0	1
	LO	4	7	63	40	114
	PR	0	0	3	0	3
	RO	0	0	15	27	42
	SC	0	6	0	0	6
	SF	0	0	7	3	10
	Total	**4**	**14**	**88**	**70**	**176**
Grand Total		**577**	**540**	**704**	**695**	**2516**

Table A10.32: Black-headed gull behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	4	0	0	0	4
	FE	0	0	1	0	1
	LO	16	9	9	14	48
	RL	2	0	22	4	28
	RO	30	47	38	38	153
	SC	0	0	0	2	2
	SF	0	0	0	3	3
	SU	1	0	0	0	1
	Total	**53**	**56**	**70**	**61**	**240**
2	LO	5	16	11	10	42
	RO	2	0	2	0	4
	SC	2	4	0	0	6
	SF	0	2	7	10	19
	Total	**9**	**22**	**20**	**20**	**71**
Grand Total		**62**	**78**	**90**	**81**	**311**

Table A10.33: Common gull behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	2	0	2
	LO	7	24	14	4	49
	RL	0	4	5	6	15
	RO	15	22	36	31	104
	SF	0	0	1	0	1
	Total	**22**	**50**	**58**	**41**	**171**
2	LO	2	6	10	8	26
	RL	2	0	0	0	2
	RO	5	3	0	0	8
	SF	0	0	2	7	9
	Total	**9**	**9**	**12**	**15**	**45**
Grand Total		**31**	**59**	**70**	**56**	**216**

Table A10.34: Lesser black-backed gull behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	2	1	2	5
	FE	17	102	184	38	341
	LO	0	39	93	87	219
	PR	0	5	15	14	34
	Total	**17**	**148**	**293**	**141**	**599**
2	-	0	0	1	2	3
	FE	1	6	34	87	128
	LO	0	1	0	5	6
	PR	0	2	0	1	3
	Total	**1**	**9**	**35**	**95**	**140**
Grand Total		**18**	**157**	**328**	**236**	**739**

Table A10.35: Red-throated diver behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	0	0	0	1	1
	FE	0	7	16	32	55
	LO	0	0	0	1	1
	PR	0	0	1	0	1
2	**Total**	**0**	**7**	**17**	**34**	**58**
	FE	0	3	10	14	27
	LO	0	0	1	0	1
	Total	**0**	**3**	**11**	**14**	**28**
Grand Total		**0**	**10**	**28**	**48**	**86**

Table A10.36: Great northern diver behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	-	16	0	0	89	105
	FE	8	429	75	495	1294
	LO	99	1175	256	1792	3531
	PR	0	44	0	4	48
	RO	15	0	0	29	44
	Total	**138**	**1648**	**331**	**2409**	**5022**
2	FE	0	91	45	350	441
	LO	0	47	0	546	598
	Total	**0**	**138**	**45**	**896**	**1039**
Grand Total		**138**	**1786**	**376**	**3305**	**6061**

Table A10.37: Common scoter behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	DP	0	5	5	0	10
	PL	9	51	13	16	89
	Total	**9**	**56**	**18**	**16**	**99**
2	DP	0	0	4	6	10
	PL	0	4	12	0	16
	Total	**0**	**4**	**16**	**6**	**26**
Grand Total		**9**	**60**	**34**	**22**	**125**

Table A10.38: Common tern behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

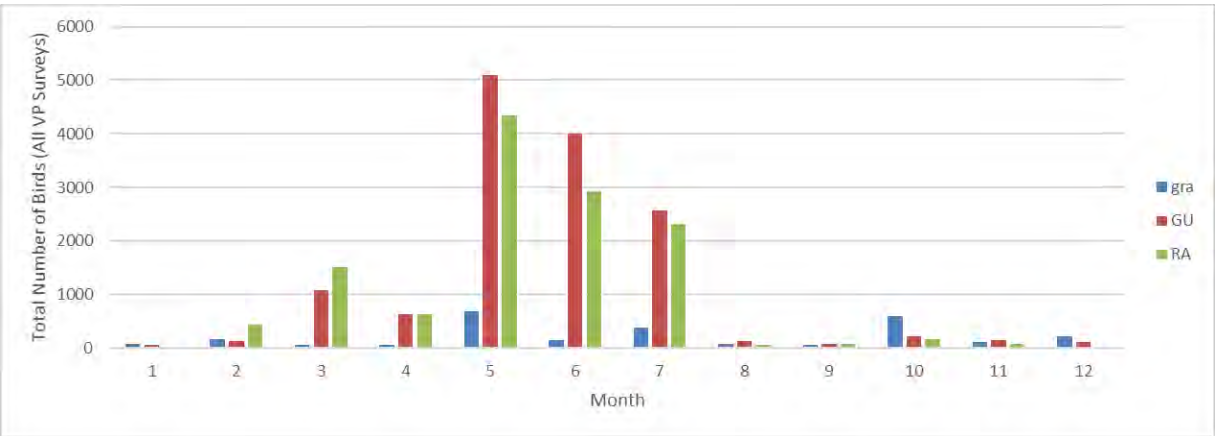
VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	DP	0	15	13	0	28
	LO	0	1	0	0	1
	PL	23	49	27	14	113
	RL	0	3	0	52	55
	RO	19	20	6	32	77
	Total	**42**	**88**	**46**	**98**	**274**
2	-	0	0	0	6	6
	DP	0	0	18	11	29
	PL	0	3	19	41	63
	Total	**0**	**3**	**37**	**58**	**98**
Grand Total		**42**	**91**	**83**	**156**	**372**

Table A10.39: Sandwich tern behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

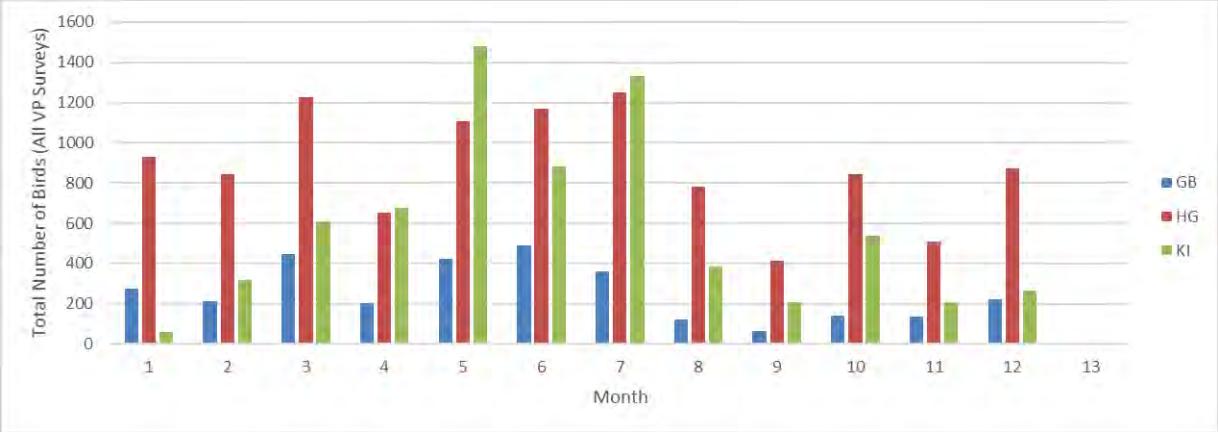
VP Number	Behaviour Code	VP Band 1	VP Band 2	VP Band 3	VP Band 4	Total
1	LO	0	0	0	27	27
	SU	0	0	0	27	27
	Total	**0**	**0**	**0**	**54**	**54**
2	FE	0	0	0	7	7
	LO	0	0	25	114	139
	RO	0	0	11	10	21
	SU	0	0	27	70	97
	Total	**0**	**0**	**63**	**201**	**264**
Grand Total		**9**	**60**	**63**	**255**	**318**

Table A10.40: Manx shearwater behaviour and distance band distribution recorded during VP surveys (all months, all survey years)

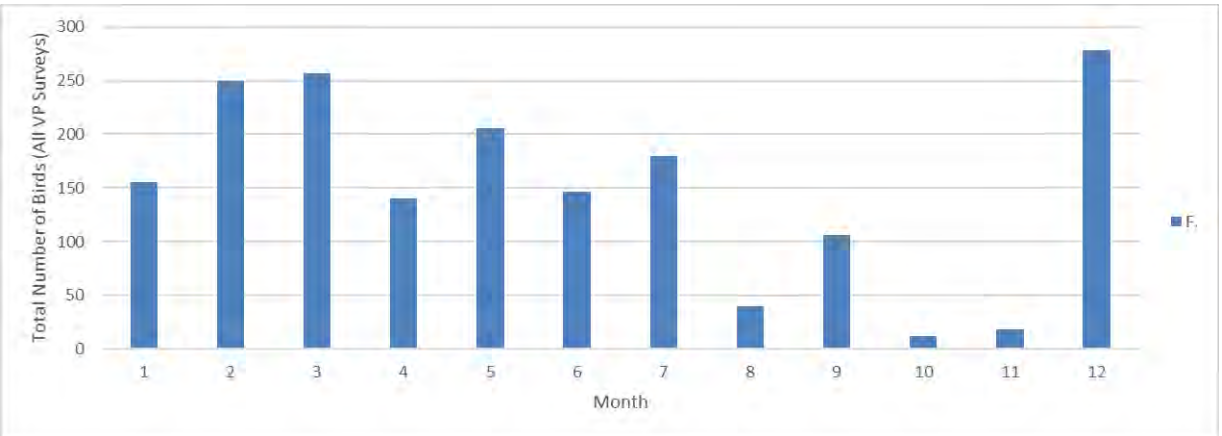
APPENDIX 5 – MARINE VP GRAPHS



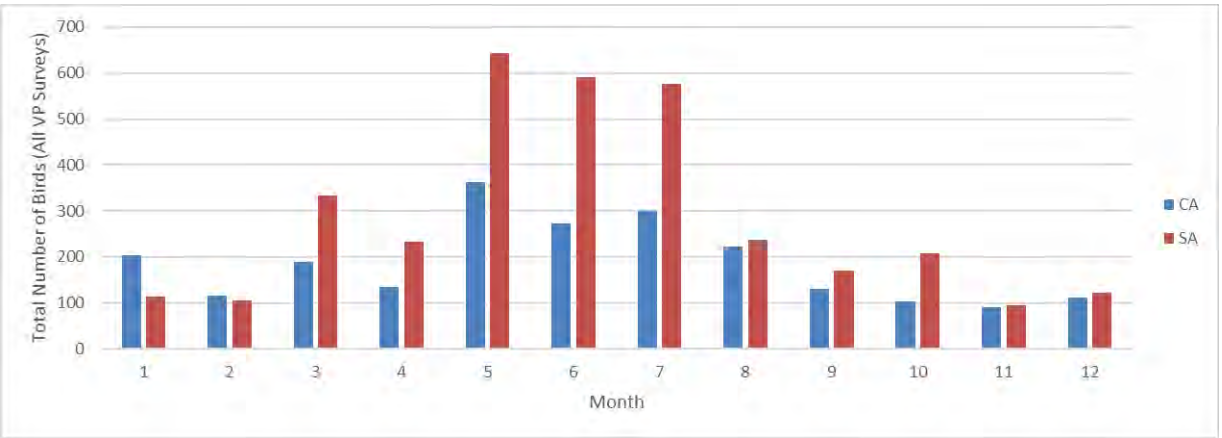
Graph A10.1: Total number of guillemots or razorbills (gra), guillemots (GU) and razorbills (RA) recorded by month **during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme



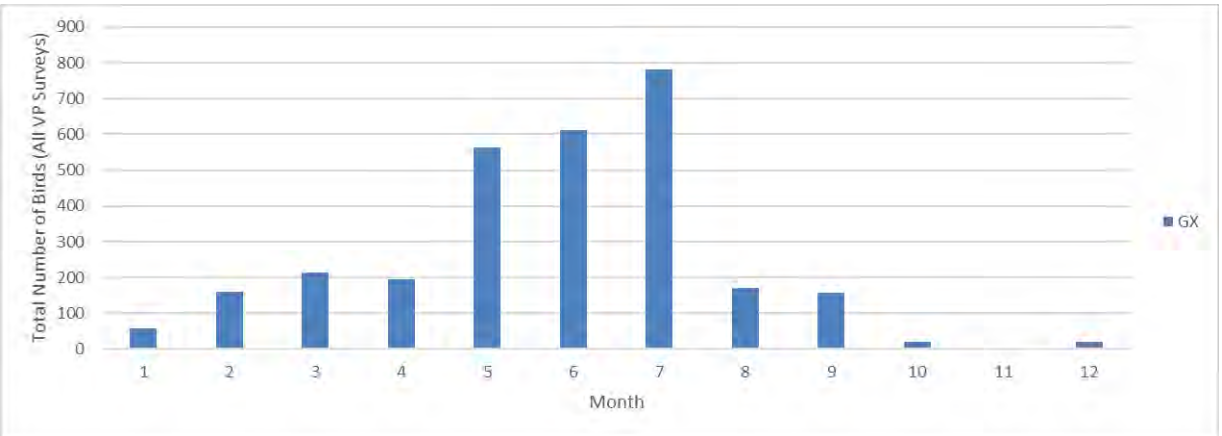
Graph A10.2: Total number of great black-backed gulls (GB), herring gulls (HG) and kittiwakes (KI) recorded by **month during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme



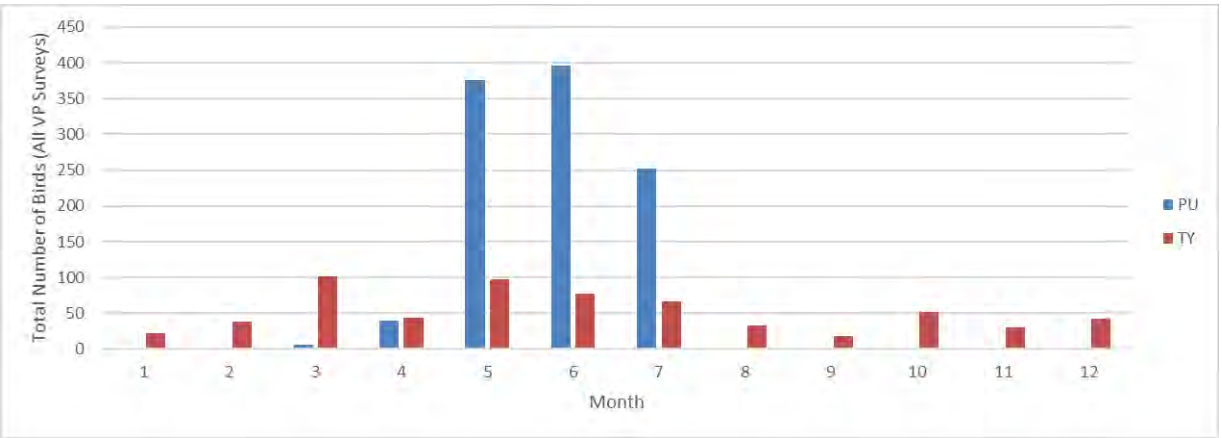
Graph A10.3: Total number of fulmars (F.) recorded by month during VP surveys (Velvet **Strand and Ireland's Eye)** during entire survey programme



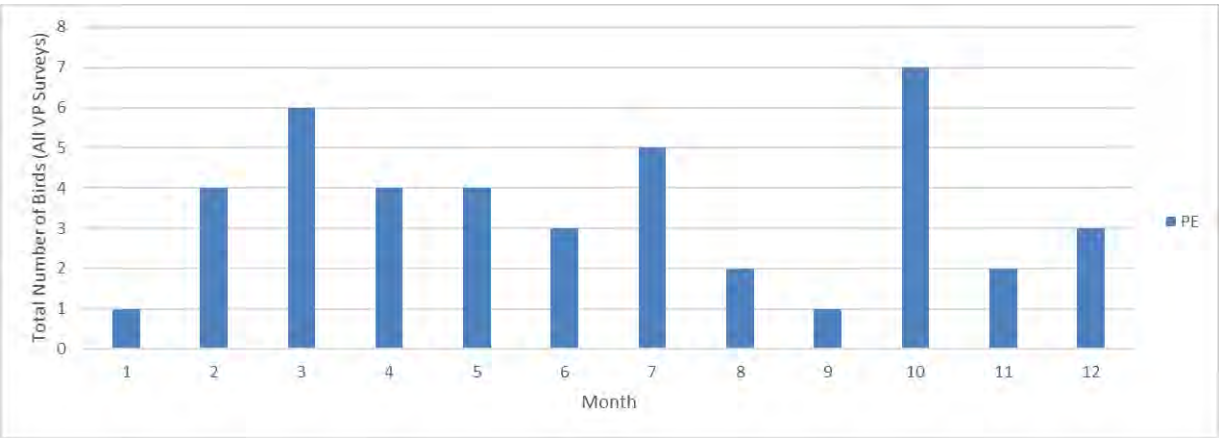
Graph A10.4: Total number cormorants (CA) and shags (SA) recorded by month during VP surveys (Velvet Strand **and Ireland's Eye)** during entire survey programme



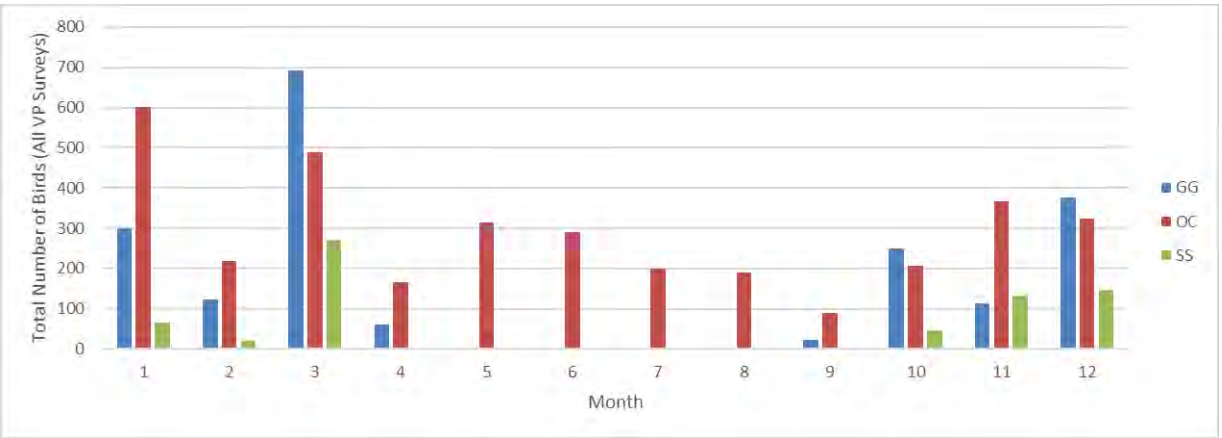
Graph A10.5: Total number of gannets **(GX) recorded by month during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme



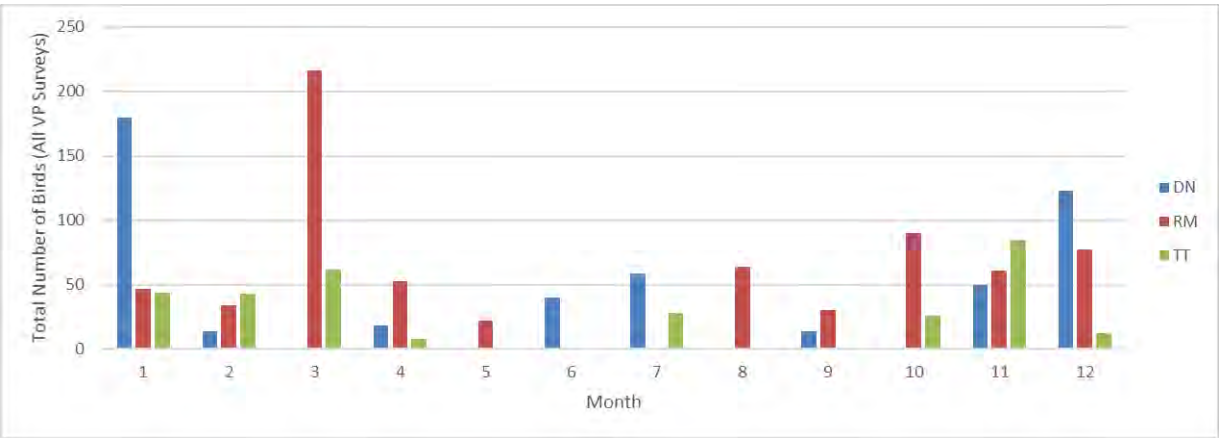
Graph A10.6: Total number of puffins (PU) and black guillemots (TY) recorded by month during VP surveys (Velvet **Strand and Ireland's Eye)** during entire survey programme



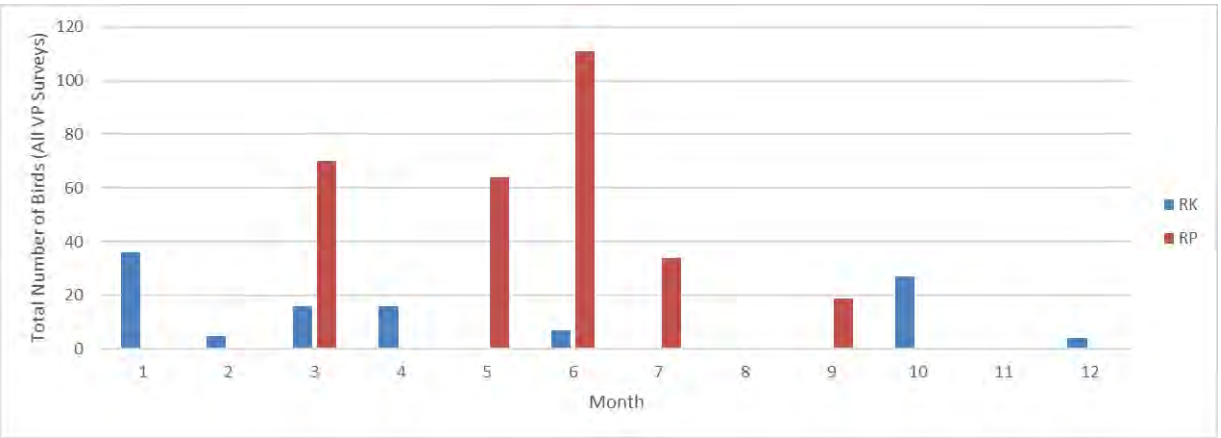
Graph A10.7: Total number of peregrines (PE) recorded by month during VP surveys (Velvet Strand and Ireland's Eye) during entire survey programme



Graph A10.8: Total number of great crested grebes (GG), oystercatchers (OC) and sanderlings (SS) recorded by **month during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme

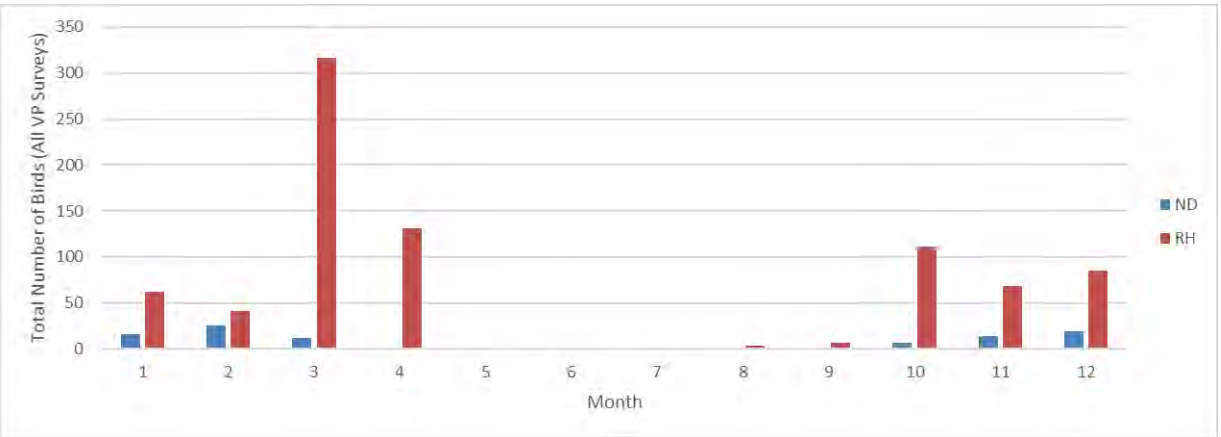


Graph A10.9: Total number of dunlins (DN), red-breasted mergansers (RM) and turnstones (TT) recorded by month **during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme

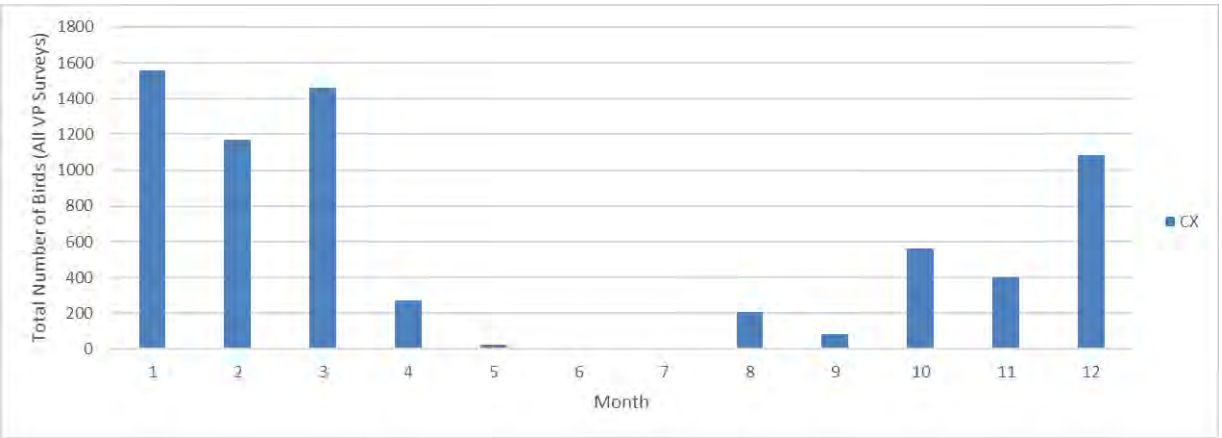


Graph A10.10: Total number of redshanks (RK) and ringed plovers (RP) recorded by month during VP surveys **(Velvet Strand and Ireland's Eye)** during entire survey programme

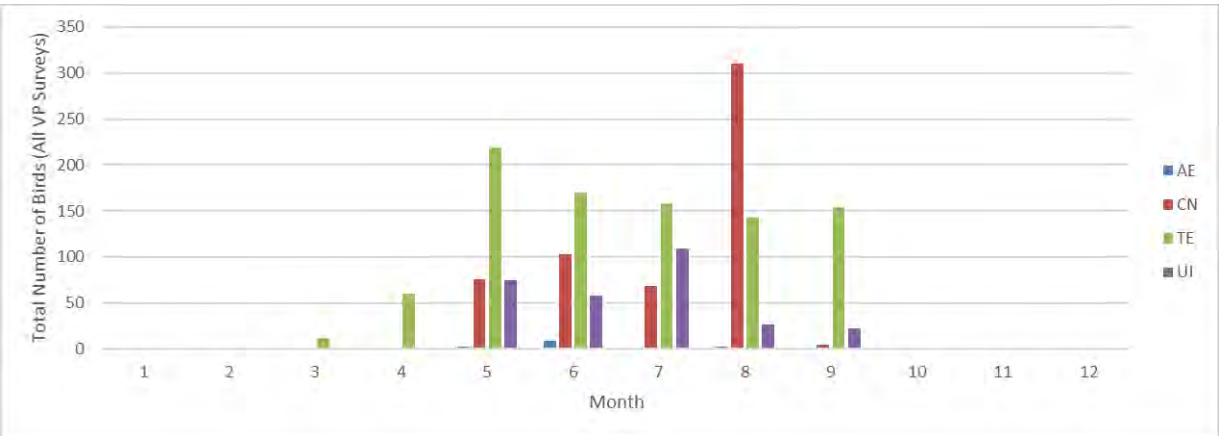
Graph A10.11: Total number of black-headed gulls (BH), common gulls (CM) and lesser black-backed gulls (LB) **recorded by month during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme



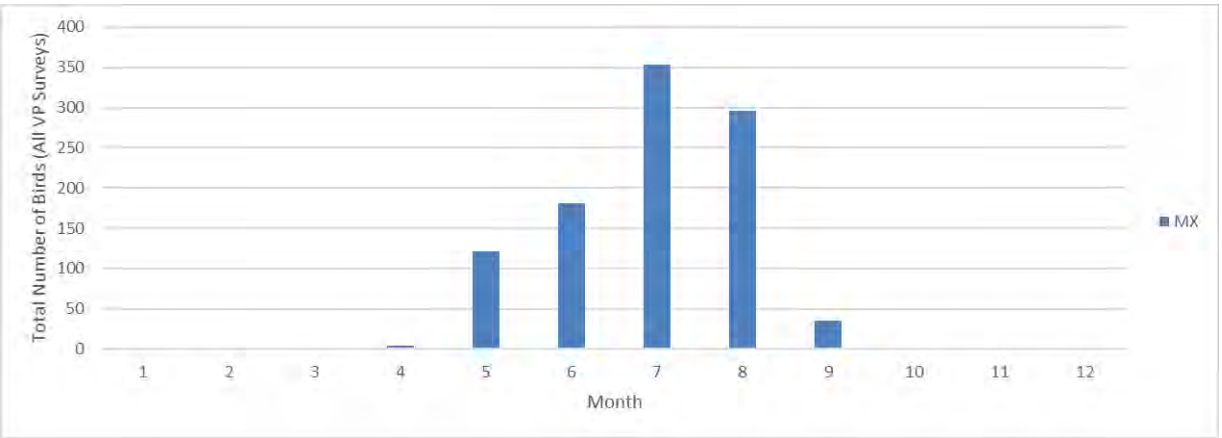
Graph A10.12: Total number of great northern divers (ND) and red-throated divers (RH) recorded by month during VP surveys (Velvet **Strand and Ireland's Eye)** during entire survey programme



Graph A10.13: Total number of common scoters (CX) recorded by month during VP surveys (Velvet Strand and **Ireland's Eye)** during entire survey programme



Graph A10.14: Total number of Arctic terns (AE), common terns (CN), Sandwich terns (TE) and **'commic' (common or Arctic) terns (UI) recorded by month during VP surveys (Velvet Strand and Ireland's Eye)** during entire survey programme



Graph A10.15: Total number of Manx shearwaters (MX) recorded by month during VP surveys (Velvet Strand and **Ireland's Eye)** during entire survey programme