Environmental Impact Assessment Report
Volume 3, Appendix 23.6: Winter Birds Report 2022 and 2023

MarramWind Offshore Wind Farm

December 2025

MarramWind

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Contents

1. Introduction

1.1 About this document

1.1.1.1 MarramWind Offshore Wind Farm (hereafter referred to as 'the Project') is wholly owned by ScottishPower Renewables UK Limited (SPR). MarramWind Limited, a subsidiary of SPR, is the Applicant for the Project.

1.1.1.2 MarramWind Limited (the Applicant) requires onshore ornithological surveys for the proposed onshore infrastructure associated with the Project, located 75 kilometres (km) off the north-east coast of Scotland.

1.1.1.3 Given the potential for works within the Project boundary to impact pink-footed geese (*Anser brachyrhynchus*), and other geese and swans associated with the Loch of Strathbeg Special Protection Area (SPA) and Ythan Estuary, Sands of Forvie and Meikle Loch SPA, there is a requirement to undertake a two year programme of surveys during the non-breeding season in order to understand the distribution and therefore likely sensitivity associated with any future proposals. Surveys focus on land identified as 'functionally linked' i.e. where SPA species utilise non-designated habitats within the wider vicinity of the European site. For the purposes of this Study, potentially functional linkage for pink-footed geese and greylag geese is considered within 20 km of a roost site, and for Whooper swan within 5 km, based on SNH (2016).

1.1.1.4 This Report describes the methods and results of the first year of surveys, designed to provide baseline information on geese and swans for the landfall regions.

1.2 Background and Scope

1.2.1.1 Wild geese and swans are known to utilise farmland within the wider environs of the Loch of Strathbeg SPA and Ythan Estuary, Sands of Forvie and Meikle Loch SPA. Consequently, there was a requirement to undertake a programme of onshore ornithological surveys during the non-breeding season, in order to understand the distribution and likely sensitivity of these large wildfowl species with respect to any future proposals.

1.2.1.2 The SPAs are European sites of importance for nature conservation. Surveys have therefore focused on land identified as 'functionally-linked' with European sites, i.e. where SPA species utilise non-designated habitats within the wider vicinity of the European sites.

1.2.1.3 Surveys were based on a large Study Area (sitting within the Project Scoping Boundary) with potential to have 'functional linkage' with the Loch of Strathbeg SPA or Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

1.3 Study Area Description

1.3.1.1 **Figure 1: Study area** is located in north-eastern Aberdeenshire. It covers approximately 356 km^2, much of which comprises agricultural land, including cropland (e.g. potato farming) and pastures (typically for cows and sheep). Significant tracts of wetland, coniferous forestry, and broad-leaved or mixed woodland occur across the area, along with several villages and scattered farmsteads. The towns of Fraserburgh and Peterhead are located at the northern and eastern edge of the Study Area, respectively. Coastal habitats and elements of tourist infrastructure are present along the North Sea coast in the east.

2. Methodology

2.1 Desk-based Review

2.1.1.1 Baseline data collection and a review of literature have been undertaken to obtain information on the Study Area. Data sources included:

- NatureScot Sitelink (at https://sitelink.nature.scot/home);
- North East Scotland Biodiversity Record Centre (NESBReC), the North East Scotland Scottish Ornithologists' Club (SOC) Bird Recorder, and other relevant bodies;
- British Trust for Ornithology (BTO) Non-Estuarine Waterbird Surveys (NEWS) and Wetland Bird Survey (WeBS) data;
- RSPB data specific to the Loch of Strathbeg;
- Scottish Bird Reports (from https://www.the-soc.org.uk/about-us/online-scottish-bird-report);
- North East Scotland Bird Reports;
- RSPB for provision of goose counts made on the Loch of Strathbeg reserve;
- Littlewood, N.A. & Sideris, K. 2016. A survey of the feeding distribution of geese around the Loch of Strathbeg. Scottish Natural Heritage Commissioned Report No. 937; and
- Patterson, I.J. 2015. Goose flight activity in relation to distance from SPAs in Scotland, including an analysis of flight height distribution. Scottish Natural Heritage Commissioned Report No. 735.

2.2 Consultation

2.2.1.1 Consultation, to agree the appropriate survey methodology and coverage, was undertaken with NatureScot and RSPB. Liaison with RSPB was also undertaken with regards to access to the Loch of Strathbeg RSPB reserve. **Table 2.1** details the dates and outcomes of, and parties to, the consultation meetings and related communication.

Table 2.1 Consultation Details

Organisation	Response	Outcome
NatureScot (16/09/22)	Acknowledgement of proposed survey methods. Request that the background and rationale behind the survey work is provided in the EIA Scoping Report, particularly if there is any deviation from published guidance.	Background and rationale for surveys is provided in **Appendix 6.5A: Winter Geese Survey Method and Rationale**.

Organisation	Response	Outcome
RSPB (27/09/22)	Acknowledgement of survey methods	n/a
Aberdeenshire Council 28/09/22)	Acknowledgement of survey methods	n/a

2.3 Field Surveys

2.3.1 Field Survey Overview

2.3.1.1 North-eastern Aberdeenshire is an important non-breeding area for geese, the overwhelming majority of these are pink-footed geese. Most geese wintering in north-eastern Aberdeenshire roost overnight at the Loch of Strathbeg SPA and RSPB reserve. This is one of the main goose roosting sites in the UK which holds internationally important numbers of pink footed geese. The main roost is found at the loch, with its geese feeding in surrounding fields during the day (and on moonlit nights). The area around the Ythan Estuary and Meikle Loch also holds internationally important numbers of pink-footed geese.

2.3.1.2 Surveys followed an approach adapted from that outlined in Littlewood & Sideris (2016) – A survey of the feeding distribution of geese around the Loch of Strathbeg.

2.3.1.3 Key objectives of the surveys were to:

- Survey the feeding distribution of geese that roost at the Loch of Strathbeg and Ythan Estuary and Meikle Loch and to identify the areas most heavily used by the geese; and
- Measure the amount of flight activity by geese in their feeding area around the Loch of Strathbeg.

2.3.1.4 Fieldwork was undertaken on three to eight days each month (depending on daylight available) between September 2022 and April 2023. The Study Area was separated into a Northern section and a Southern section. Each survey visit comprised distribution surveys for one section and corresponding flight vantage point (VP) counts within that section.

2.3.2 Distribution Surveys

2.3.2.1 The distribution survey method followed that used by Littlewood & Sideris (2016), who surveyed the feeding distribution of geese around the Loch of Strathbeg in 2016. Survey scope was also informed by the fact that most pink-footed geese in North-East Scotland forage within 20 km of their roost site (Patterson, 2013).

2.3.2.2 The Study Area was therefore designed to encompass:

- All likely areas where significant numbers of geese and swans that roost at Loch of Strathbeg may feed.
- Likely goose feeding areas within the south of the Study Area potentially associated with the Ythan Estuary, Sands of Forvie and Meikle Loch SPA.

2.3.2.3 Survey approach involved driving most of the rural roads within the Study Area, noting the presence and size of geese and swan flocks. The Study Area was split into Northern and Southern areas. The combined length of the Northern and Southern transects, including the

addition of a route through this area, totalled circa 289 km per month. Survey effort each month was virtually constant, with minor variations noted in Section 2.3.5. Both driven transects provide good visual coverage of the Study Area and likely foraging areas.

2.3.2.4 Following Littlewood & Sideris (2016), the starting point and direction of the route was varied for each survey visit. This was to reduce systematic bias relating to the time of day when each part of the area was visited. Fieldwork was timed to avoid the main times when geese were flying to and from roosts, i.e. it avoided the first and last two hours of daylight.

2.3.2.5 Whilst driving the route, if geese were noted, they were observed from the roadside, where safe to do so. Suitable informal view-point positions that provided clear views across large areas were identified. The surveyor employed binoculars and telescope, where appropriate.

2.3.2.6 When geese on the ground were found, their identification was noted and the location of the centre of the flock was marked on a high-resolution digital map. The number of geese of each species in each flock was counted or estimated. If there were areas within a flock that were not visible from the road, the geese were watched for a few minutes to make a judgement based on birds moving in and out of view. Swans seen on land were also noted.

2.3.2.7 The field type was noted based on one of the following categories: grass, stubble, ploughed, winter cereal, other arable crop, and other. Bird activity was not, however, noted within a field. This is because although most birds may be feeding when found, this will not necessarily be the case for all birds in the flock.

2.3.2.8 Fieldwork was planned for days on which the weather was forecast to be suitable for making observations, and not likely to influence goose distribution abnormally around the Study Area. This comprised days when the wind was forecast to be no stronger than Beaufort force 5, with rain not exceeding short showers and with good visibility. During the course of the survey, some survey days included at least two surveys where winds exceeded Beaufort 6 and two survey visits in moderate to heavy rain. However, on these occasions, geese were still recorded across the Study Area and whilst conditions were considered poorer than average, they were not considered to greatly influence the data captured.

2.3.2.9 Distribution survey dates, surveyors and weather conditions are presented in **Appendix A**. Weather-related constraints are described in more detail in **Section 2.3.4**

2.3.3 Flight Activity Surveys

2.3.3.1 Regular vantage point watches were undertaken to capture a baseline level of geese and swan flight activity, suitable to supplement the distribution surveys. Six vantage points were adopted (following Littlewood & Sideris, 2016). Where current goose management scheme boundaries exist, the vantage points correspond with these areas. The precise positions of vantage points were selected to allow clear views over as wide an area as possible, and to permit convenient and safe parking at the location or close by. The vantage points are illustrated in **Figure 2: Driven transects and vantage points** and locations detailed in **Table 2.2**.

Table 2.2 Vantage Point (VP) Locations

Name	Transect	Grid Reference
Kirkhill	South	NK00625253
Rattray	South	NK08525756
St Fergus	South	NK10995213

Name	Transect	Grid Reference
Cairnbulg	North	NK03206410
Coralhill	North	NK05396049
Memsie	North	NJ96596277

2.3.3.2 At each vantage point, a watch was conducted for one hour once during each Northern or Southern survey visit. All geese and swans seen through 360°, out to 5 km distance were noted. Birds would initially be located either by sight or sound and a full scan of more distant parts of the watch area, using binoculars and telescope, was conducted at around five-minute intervals. The order in which the six vantage point watches were conducted was varied each month.

2.3.3.3 When geese and swans were noted, the time, species, flock size (estimated if necessary), direction of flight, and direction and distance from observer were recorded. Flight height was also noted. For closer flocks (up to about 500 m distance) this was assessed, when possible, using a laser rangefinder (model Hawke LRF 900), set to measure vertical distance above the observation position. Measurements made with the laser rangefinder were used to guide estimates of flight height for other flocks. A note was made of whether the height was estimated or measured with the laser rangefinder.

2.3.3.4 Any disturbance events that caused birds to take flight, or had a reasonable potential to do so, was noted. Flight activity survey dates and start times are shown for each VP in **Appendix A**. Weather conditions for each visit are given in **Appendix A**.

2.3.3.5 The survey was designed as a sampling exercise, rather than a detailed assessment of goose movements across the whole area. The primary metric assessed was the number of geese in flight per area (similar to that described by Littlewood & Sideris, 2016).

2.3.4 Analysis

2.3.4.1 For the distribution survey, the grid references of goose flocks (all species combined) were initially mapped into QGIS before being transferred into ArcGIS Pro software for further analysis. Data were then used, along with open-source background maps, to generate maps of goose abundance. The data were analysed to display trends through the survey period.

2.3.4.2 Data were also analysed to determine the proportion of birds recorded in each field type.

2.3.4.3 For the flight survey, each goose flock was assigned to a single 1 km square, based on its flight path and closest estimated distance from the observer. Further details of this technique can be found in Littlewood & Sideris (2016).

2.3.5 Limitations

2.3.5.1 While surveys were planned for days with acceptable weather, actual conditions during surveys were not always optimal. The distribution survey on 30 September 2022 had to be paused due to high wind and rain, with 1.6 km of the transect not driven due to unsafe conditions. Additionally, the flight activity survey at Rattray on 10 November 2022 had to be stopped after 30 minutes, due to a combination of high winds (making it hard to hear geese flight calls) and declining visibility. Weather conditions and visibility also meant the Coralhill vantage point was not surveyed during September's visit, and the Kirkhill vantage point was not surveyed during the November visit.

2.3.5.2 During the January 2023 visits, 0.7 km of the transect was inaccessible due to flooding. A further 0.5 km could not be surveyed due to a road closure north of Memsie.

2.3.5.3 While this reduced the amount of data available for the baseline, it is still considered that the data set captured is fit for purpose. This extensive data set comprises 239 goose and swan records collected during 40 days of fieldwork over an eight-month period. The inaccessible lengths of road form a very small proportion (less than 0.6%) of the entire 289 km surveyed each month. Moreover, in almost all cases, a full survey was completed without such limitations.

3. Results

3.1 Desk-based Review

3.1.1 Designated Sites

3.1.1.1 Sites designated for geese or swans within 20 km of the Study Area are summarised in **Table 3.1.** A number of other designations along the coastline are notified for their breeding seabird colonies; however, they are not relevant to this survey report.

Table 3.1 Designated Sites

Designated Site	Qualifying Features	Distance and direction from Site
Loch of Strathbeg SPA/ Ramsar/SSSI	Qualifying features of the SPA: • Barnacle goose (non-breeding); • Greylag goose (non-breeding); • Pink-footed goose (non-breeding); • Sandwich tern (breeding); • Teal (non-breeding); • Whooper swan (non-breeding); • Goldeneye (non-breeding); and • Waterfowl assemblage (non-breeding). Qualifying features of the Ramsar site: • Barnacle goose (non-breeding – wintering); • Pink-footed goose (non-breeding – passage); • Whooper swan (non-breeding – wintering).	**SPA/Ramsar – 5km, N** **SSSI – 3.8km, N**
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	Qualifying features of the SPA site: • Sandwich tern (breeding); • Common tern (breeding); • Little tern (breeding); • Pink-footed goose (non-breeding); • Waterbird assemblage (non-breeding); • Eider (breeding); • Lapwing (non-breeding); and • Redshank (non-breeding).	**6.7 km, S**
Ythan Estuary and Meikle Loch Ramsar **Meikle Loch an Kippet Hills SSSS**	Qualifying features of the Ramsar site: • Pink-footed goose (non-breeding) • Sandwich tern (breeding) Qualifying features of the SSSI site: • Pink-footed goose (non-breeding); • Greylag goose (non-breeding)	**12.4 km, S** **10.8 km, S**
Sands of Forvie and Ythan Estuary SSSI	Notified features of the SSSI: • Arctic tern (breeding);	**9.82 km, S**

Designated Site	Qualifying Features	Distance and direction from Site
	• Common tern (breeding); • Little tern (breeding); • Sandwich tern (breeding); • Eider (breeding, non-breeding); • Pink-footed goose (non-breeding); • Breeding bird assemblage; and • Wildfowl assemblage (non-breeding).	

Loch of Strathbeg Designations

3.1.1.2 The Loch of Strathbeg SPA, Ramsar Site, Site of Special Scientific Interest (SSSI) and RSPB Reserve fall wholly within the Study Area. Their locations are illustrated on **Figure 3: Designated sites within study area**. The SPA is designated for its waterbird assemblage, in particular a number of wintering species including pink-footed goose, greylag goose (*Anser anser*), whooper swan (*Cygnus cygnus*) and Svalbard barnacle goose (*Branta leucopsis*). The first three of these species are also notified features of the Loch of Strathbeg SSSI.

3.1.1.3 Barnacle geese are a qualifying species of the SPA under Article 4.1 of the Birds Directive (SNH, 2018) as occurring in numbers of European importance (a 5-year winter peak mean between 2005/06 and 2009/10 of 520 individuals, 1.6% of the GB population). Whooper swan also meet the criteria of Article 4.1, with a 5-year winter peak mean of 245 individuals (4% of the GB population) between 1986/87 and 1990/91. The SPA's pink-footed goose and greylag goose qualify as migratory populations of European importance. From 1986/87 to 1990/91, the average winter peak counts of pink-footed geese and greylag geese were 27,500 birds (25% of the Eastern Greenland/Iceland/UK biogeographic population) and 5,565 birds (6% of the Iceland/UK/Ireland biogeographic population) respectively.

3.1.1.4 The Loch of Strathbeg qualifies as a Ramsar Site under multiple Ramsar criteria. Of most interest to the current Study are the populations of pink-footed goose, barnacle goose and whooper swan, which qualify for protection under Criterion 6. By 2006, all three had been recorded in greater peak numbers than listed in the SPA citation. Pink-footed geese peaked at 34,797 individuals in spring/autumn (an average of 14.4% of the Greenland/Iceland/UK population). The wintering whooper swan and barnacle goose populations had risen to 290 and 3,418 birds respectively (JNCC, 2006)

Ythan Estuary, Sands of Forvie and Meikle Loch SPA

3.1.1.5 Ythan Estuary, Sands of Forvie and Meikle Loch SPA lies 2.3 km south of the Study Area at its closest point. The SPA qualifies under Article 4.1 by regularly supporting populations of European importance of the Annex 1 species: Sandwich tern (1989 to 1991, up to 1125 pairs, up to 7% of the GB population); common tern (1989 to 1993, up to 265 pairs, up to 2% of the GB population); and little tern (1989 to 1993, up to 41 pairs, up to 2% of the GB population). The marine component, immediately offshore of the terrestrial area forms the foraging zone for both Sandwich terns and little terns. The SPA further qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species: pink-footed goose; and its waterfowl assemblage.

Ythan Estuary and Meikle Loch Ramsar and Meikle Loch and Kippet Hills SSSI

3.1.1.6 Ythan Estuary and Meikle Loch Ramsar site is situated approximately 11 km to the South of the Study Area. The Site is notified for its breeding population of sandwich tern, as well

as its non-breeding population of Pink-footed goose and wintering waterfowl assemblage. Between 15% and 20% of the north-west European population of pink-footed geese and up to 10% of the greylag population use the loch regularly and the loch is consequently of European and international importance for these species.

3.1.1.7 Meikle Loch is a small eutrophic loch with little aquatic vegetation. It lies in an area of intensive farming and is one of the major roosts for the large numbers of greylag and pink-footed geese which occur in the Grampian lowlands from autumn to spring. Other wildfowl occur in smaller numbers on passage and in winter, including teal, pochard, wigeon and tufted duck.

3.1.2 Data from Littlewood & Sideris (2016)

3.1.2.1 Littlewood & Sideris (2016) recorded a peak in goose abundance in late March / early April 2016. The peak count amounted to 17,489 geese, almost all of which were pink-footed geese. Totals of 407 greylag geese, 95 barnacle geese, 16 Greenland and three European white-fronted geese, five Canada geese and a single pale-bellied brent goose were also sighted.

3.1.2.2 Throughout this work in Spring 2016, goose flocks made heavy use of the area south-east of the Loch of Strathbeg, towards the St Fergus gas terminal. Areas south of the terminal, northwest of the Loch of Strathbeg, at Crimond and west of Fraserburgh also supported concentrations of sizeable flocks during at least one visit. 93.4% of all geese recorded were found in grass fields, with a further 3.3% using winter cereal fields.

3.1.2.3 Littlewood & Sideris (2016) reported 201 goose flocks from flight surveys. These totalled 19,323 birds, with the highest numbers being close to the feeding areas identified. The overall mean height of flocks was 50.1m above ground. Very few instances of direct disturbance triggering flock flight were noted. Most flocks were thought likely to be flying between different fields to feed.

3.1.3 Data from Patterson (2015)

3.1.3.1 Patterson (2015) assessed goose flight height and activity at sites across Scotland. Within North-east Aberdeenshire, goose flight activity was generally highest within 10 km of the pink-footed goose roost at the Loch of Strathbeg SPA. Relatively high levels were also recorded 10 - 20 km from the SPA, and within 20 km of the goose roost at Meikle Loch.

3.1.3.2 In general, goose flight activity declined with distance from the nearest roost SPA. However, high levels of flight activity (over 20 geese per km^2 per hour observed) were still noted over a hotspot near Strichen, at the edge of the MarramWind Project goose survey Study Area.

3.1.4 BTO Data

3.1.4.1 Data received from the BTO is summarised in **Table 3.2**. No large waterfowl records were returned from Fraserburgh Bay, Peterhead Bay or Sandford Bay in the five-year dataset provided (2016 - 2020). Seven migratory species/populations, one partially migrant species (Canada goose) and two resident species/populations (domestic greylag goose and mute swan) were recorded. Combining the peak counts of these birds, at least 20,146 individuals were counted. The vast majority of these were migratory geese at the Loch of Strathbeg.

Table 3.2 Summary of BTO Goose and Swan Records 2016-2020

Species	Loch of Strathbeg		Ugie Estuary	
	Peak Count	Total	Peat Count	Total
Barnacle Goose	899	1,293	0	0
Bean Goose sp.	2	2	0	0
Canada Goose	31	33	0	0
Greenland White-fronted Goose	3	3	0	0
Greylag Goose (Iceland)	210	940	100	561
Greylag Goose (British/Irish)	14	16	83	247
Pink-footed Goose	17,252	211,949	1	1
Snow Goose	3	6	0	0
Mute Swan	542	6,255	10	85
Whooper Swan	1,167	12,277	0	0

3.1.5 SOC Data

3.1.5.1 Data received from the SOC is summarised in **Table 3.3**. This shows that 16 goose species/populations (plus some individuals, not assigned to a distinct species or population) and two swan species were recorded in the Study Area in the ten years from 2012 to 2021. **Figure 4: Qualifying goose and swan records (10km resolution)** shows records of pink-footed goose and whooper swan from this period, that could only be localised to a 10 km grid square. **Figures 5 – 12** map finer-scale data for these species from each month of the winter and migration seasons. Records of geese or swans flying over the sea have been excluded, in order to focus attention on land-based birds.

Table 3.3 Summary of SOC Goose and Swan Records 2016-2020

Species	Peak Count	Total
Barnacle Goose	300	2,430
Bean Goose *sp.*	2	5
Taiga Bean Goose	2	16
Tundra Bean Goose	4	7
Brent Goose (Dark-bellied/Pale-bellied)	16	40

Species	Peak Count	Total
Brent Goose (Dark-bellied)	5	13
Brent Goose (Pale-bellied)	15	79
Cackling Goose	1	2
Canada Goose (Lesser)	1	1
Canada Goose (Todd's)	1	1
Canada Goose (likely British)	26	42+
Egyptian Goose	1	1
European White-fronted Goose	206	408
Goose *sp.*	1+	2+
Greenland White-fronted Goose	8	55
White-fronted Goose *sp.*	6	31
Greylag Goose	675	3,518+
Pink-footed Goose	65,000	4,302,436+
Ross's Goose	1	3
Snow Goose	2	55+
Bewick's Swan	3	6
Mute Swan	458	8,788+
Whooper Swan	1,167	84,923+

3.2 Field Surveys

3.2.1 Distribution Surveys

3.2.1.1 The 2022/23 distribution surveys recorded a total of **12,949 geese** of five species. Goose abundance peaked in March with a peak count of 3,341 birds, almost all of which were pink-footed geese. 254 greylag geese, seven barnacle geese, seven Russian white-fronted geese, and a single Canada goose were also sighted.

3.2.1.2 In addition, **605 swans** were recorded on land during the surveys. These comprised 560 whooper swans, 44 mute swans and a single unidentified swan (likely whooper or mute).

3.2.1.3 Throughout the surveys, goose/swan flocks made heavy use of the area within 3 km of the Loch of Strathbeg. This was most pronounced between December and February. From September to November, birds were more widely distributed, with an additional cluster southwest of Fraserburgh. In March, bird groupings were evident around St Fergus, Rora

and Kininmonth. However, in April 2022, birds were again clustered more tightly around the Loch of Strathbeg. Monthly distributions are illustrated on **Figures 13 – 20**.

3.2.1.4 The goose hotspot south of the St Fergus gas terminal noted by Littlewood & Sideris was recorded throughout winter 2022/23 until late March. Between 297 and 700 pink-footed geese were recorded in this area during each of November, January, February and March. Areas at Crimond, west of Fraserburgh, northwest of the Loch of Strathbeg, and at Memsie and Kininmonth also supported a concentration of sizeable flocks during at least one visit.

3.2.1.5 64.4% of all geese and swans recorded were found in grass fields, with a further 26.7% using stubble. Both geese and swans showed a preference for grass fields, although swans preferred stubble until February/March. Proportional use of stubble was much higher than noted in 2016 by Littlewood & Sideris. This is probably because by March and April, when the 2016 study was conducted, little stubble remained from the previous year's farming. Indeed, stubble usage by geese and swans during winter 2022/23 also declined after February.

3.2.2 Flight Activity Surveys

3.2.2.1 82 goose or swan flocks, comprising 4,146 birds, were recorded during 45 hours and 34 minutes of flight surveys. The highest numbers were seen over Memsie, the Loch of Strathbeg and St Fergus, close to the feeding areas noted. The mean height of flocks was 67.4m above ground. **Plate 3.1, Table 3.3** and **Table 3.4** provide a breakdown of these records.

Plate 3.1. Monthly total counts of geese and swans during flight surveys between September 2022 and April 2023

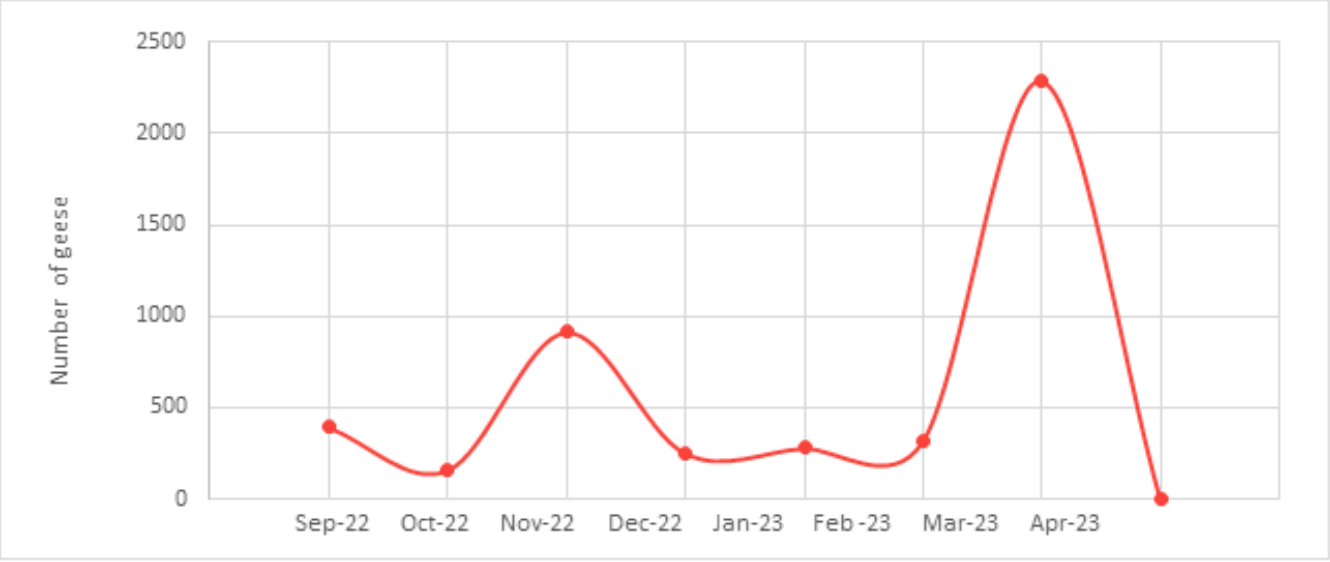

Table 3.4 Sum of geese and swans recorded in flight during the monthly one-hour watch at each vantage point (number of flocks given in brackets)

Month	Kirkhill	Rattray	St. Fergus	Cairnbulg	Coralhill	Memsie
September	0	37 (2)	0	288 (3)	*No survey*	82 (1)
October	0	0	0	41 (1)	53 (4)	66 (4)
November	*No survey*	77 (1)	174 (8)	20 (2)	330 (2)	0
December	105 (4)	63 (3)	57 (2)	0	0	0
January	0	61 (2)	8 (2)	45 (3)	3 (1)	44 (4)
February	0	29 (1)	50 (1)	20 (2)	92 (5)	95 (4)
March	71 (3)	45 (1)	0	574 (2)	1,587 (3)	6 (1)
April	0	0	0	0	0	1 (1)

Table 3.5 Species totals recorded during flight surveys between September 2022 and April 2023

Species	Total
Pink-footed Goose	4018
Tundra Bean Goose	1
Goose sp.	55
Grey goose sp.	40
Swan sp.	1
Whooper Swan	31

3.2.2.2 Relatively few instances of direct disturbance triggering flock flight were noted. However, vehicle approach was recorded as a potential or likely cause of goose flight in eight cases. Three instances of potential disturbance by walkers with or without dogs, and one each of potential disturbance by shooting, helicopter flight and livestock were also noted. Most flocks were, nonetheless, considered likely to be flying between different fields to feed. A small number of flocks, typically recorded during later afternoon watches, were thought to be flying to or from their roost site.

3.2.2.3 The number of geese on land and in flight were lower than noted by Littlewood & Sideris (2016). However, Littlewood & Sideris carried out more (eight, rather than seven) visits per transect and VP. Their surveys were also carried out in March and April only, rather than aiming to gain a picture of the whole winter and goose passage season. The two surveys are not therefore fully comparable.

3.2.2.4 Disturbance levels were similar to those recorded in the 2016 surveys. While Littlewood & Sideris noted 13 potential disturbance events during flight surveys, 14 such events were recorded during flight surveys in 2023. Disturbance events are summarised in **Table 3.6**.

Table 3.6 Disturbance events noted during flight surveys

Location	Species	Number	Date/Time	Disturbance event
Memsie	Pink-footed goose	7	26/10/22, 1556	Vehicles
West of Memsie	Pink-footed goose	2	26/10/22, 1610	Vehicles
Cairnbulg	Pink-footed goose	41	27/10/23, 1210	Vehicles
St Fergus	Pink-footed goose	5	09/11/22, 1001	Vehicles
St Fergus	Pink-footed goose	2	09/11/22, 1008	Vehicles
St Fergus	Pink-footed goose	2	09/11/22, 1023	Shooting
St Fergus	Pink-footed goose	28	09/11/22, 1034	Vehicles
St Fergus	Pink-footed goose	1	09/11/22, 1038	Walker
St Fergus	Pink-footed goose	1	09/11/22, 1045	Walker
St Fergus	Pink-footed goose	113	09/11/22, 1053	Vehicles
St Fergus	Whooper swan	8	05/12/22, 1550	Possible disturbance by cattle
St Fergus	Whooper swan	5	05/12/22, 1605	Possible disturbance by dog walker
Coralhill	Pink-footed goose	28	21/02/23, 1733	Vehicle
Loch of Strathbeg	Pink-footed goose	1,030	24/03/23, 1125	Helicopter

4. Summary

4.1.1.1 Goose and swan distribution surveys carried out in the 2022/23 non-breeding season recorded a total of 12,949 geese of five species. In addition, 605 swans were recorded on land during the surveys. These comprised whooper swans, mute swans and a single unidentified swan (likely whooper or mute). Throughout the surveys, goose/swan flocks made heavy use of the area within 3 km of the Loch of Strathbeg (**Figure 21: Combined geese and swan distribution map**). Additional clusters were evident southwest of Fraserburgh, around St Fergus, Rora and Kininmonth, and south of the St Fergus gas terminal.

4.1.1.2 64.4% of all geese and swans recorded were found in grass fields, with a further 26.7% using stubble. Both geese and swans showed a preference for grass fields, although swans preferred stubble until February/March.

4.1.1.3 Eighty-two goose or swan flocks, comprising 4,146 birds, were recorded during flight activity surveys. The highest numbers were seen over Memsie, the Loch of Strathbeg and St Fergus, close to feeding areas noted.

4.1.1.4 Further surveys are being carried out in the 2023/24 non-breeding season. These have been tailored to focus on the area within an updated project boundary.

5. References

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Appendix A
Distribution Survey Dates and Conditions

Table A.1 Distribution Survey Dates and Conditions

Date	Surveyor	Section	Weather Conditions
13/09/2022	J Sneddon	South	50% cloud cover, 17ºC, no precipitation, Beaufort wind force 4 west
14/09/2022	J Sneddon	South	100% cloud cover, 15ºC, no precipitation, Beaufort wind force 4 west
15/09/2022	J Sneddon	South	80% cloud cover, 12ºC, mainly dry with some light showers, Beaufort wind force 4 northwest
29/09/2022	D Flenley	North	95% cloud cover, 12-15ºC, no precipitation, Beaufort wind force 3 southeast
30/09/2022	D Flenley	North	100% cloud cover, 11ºC, rain, Beaufort wind force 4-8 south
17/10/2022	J Sneddon	South	30% cloud cover, 12ºC, no precipitation, Beaufort wind force 4 south
18/10/2022	J Sneddon	South	80% cloud cover, 13ºC, no precipitation, Beaufort wind force 2 north
19/10/2022	J Sneddon	South	95% cloud cover, 10ºC, no precipitation, Beaufort wind force 2 southeast
26/10/2022	D Flenley	North	100% cloud cover, 13ºC, light rain showers for part of day, Beaufort wind force 4-6 southwest
27/10/2022	D Flenley	North	95% cloud cover, 11ºC, no precipitation, Beaufort wind force 6 northwest
08/11/2022	D Flenley	South	95% cloud cover, 11ºC, light rain, Beaufort wind force 6 northwest
09/11/2022	D Flenley	South	15% cloud cover, 9ºC, no precipitation, Beaufort wind force 4 southwest
10/11/2022	D Flenley	South	90% cloud cover, 12-14ºC, no precipitation, Beaufort wind force 5 west
21/11/2022	J Sneddon	North	80-90% cloud cover, 0-2ºC, rain shower early afternoon, Beaufort wind force 2-3 north
22/11/2022	J Sneddon	North	80% cloud cover, 5ºC, rain, Beaufort wind force 1 north
05/12/2022	J Sneddon	South	100% cloud cover, 5ºC, no precipitation, Beaufort wind force 2 north

Date	Surveyor	Section	Weather Conditions
06/12/2022	J Sneddon	South	80-100% cloud cover, 3ºC, no precipitation, Beaufort wind force 2-3 north
07/12/2022	J Sneddon	North	50-70% cloud cover, 3-4ºC, light rain shower around 9.50 a.m., Beaufort wind force 2-3 north
16/01/2023	J Sneddon	South	10% cloud cover, 0ºC, no precipitation, Beaufort wind force 1 north
17/01/2023	J Sneddon	South	10-100% cloud cover, -3 to -1ºC, no precipitation, Beaufort wind force 1-2 north
18/01/2023	J Sneddon	South	0-100% cloud cover, 2 to 3ºC, no precipitation, Beaufort wind force 4 west to northwest
24/01/2023	D Flenley	North	85% cloud cover, 15-18ºC, no precipitation, Beaufort wind force 1 south
25/01/2023	D Flenley	North	95% cloud cover, 8ºC, light rain, Beaufort wind force 3 southwest
26/01/2023	D Flenley	North	45% cloud cover, 8ºC, no precipitation, Beaufort wind force 4 northwest
27/01/2023	D Flenley	North	85% cloud cover, 5ºC, no precipitation, Beaufort wind force 2 south-southwest
13/02/2023	J Sneddon	South	0 cloud cover, 5°C, no precipitation, Beaufort wind force 3 southwest
14/02/2023	J Sneddon	South	50% cloud cover, 9ºC, no precipitation, Beaufort wind force 1 south
15/02/2023	J Sneddon	South	80% cloud cover, 5°C, heavy rain, Beaufort wind force 2 west
22/02/2023	D Flenley	North	95% cloud cover, 5°C, light rain, Beaufort wind force 3 southwest
23/02/2023	D Flenley	North	15% cloud cover, 6°C, no precipitation, Beaufort wind force 2 east
24/02/2023	D Flenley	North	90% cloud cover, 6°C, no precipitation, Beaufort wind force 1 north
21/03/2023	J Sneddon	South	30-50% cloud cover, 9-13°C, no precipitation, Beaufort wind force 1-2 south
22/03/2023	J Sneddon	South	10% cloud cover, 10°C, no precipitation, Beaufort wind force 4 southeast
23/03/2023	D Flenley	North	30% cloud cover, 9-12°C, no precipitation, Beaufort wind force 2 southwest
24/03/2023	D Flenley	North	90% cloud cover, 13°C, no precipitation, Beaufort wind force 2 northwest

Date	Surveyor	Section	Weather Conditions
25/04/2023	J Sneddon	South	40% cloud cover, 7°C, no precipitation, Beaufort wind force 3 north
26/04/2023	J Sneddon	South	40% cloud cover, 7°C, no precipitation, Beaufort wind force 3 east
25/04/2023	D Flenley	North	30% cloud cover, 5°C, no precipitation, Beaufort wind force 3 southeast
26/04/2023	D Flenley	North	70% cloud cover, 6°C, infrequent rain and hail showers, Beaufort wind force 2-3 north

Table A.2 Flight Activity Survey Dates and Start Times

Month	Kirkhill	Rattray	St Fergus	Cairnbulg	Coralhill	Memsie
September 2022	14/09, 1115	14/09, 0915	13/09, 1630	29/09, 1536	-	29/09, 1156
October 2022	19/10, 1250	19/10, 0940	18/10, 1445	27/10, 1200	26/10, 1118	26/10, 1511
November 2022	-	10/11, 1606 *	09/11, 0954	21/11, 1422	22/11, 0930	21/11, 1300
December 2022	06/12, 1020	06/12, 0855	05/12, 1520	07/12, 0950	07/12, 1454	07/12, 1159
January 2023	17/01, 1243	17/01, 1033	16/01, 1345	26/01, 1525	26/01, 1333	25/01, 0940
February 2023	14/02, 1341	13/02, 1407	14/02, 1007	23/02, 1434	21/02, 1643	23/02, 1124**
March 2023	21/03, 1353	21/03, 0931	21/03, 0819	24/03, 1225	24/03, 1055	23/03, 1604
April 2023	25/04, 0833	24/04, 1456	25/04, 1019	27/04, 1157	27/04, 1444	27/04, 1005

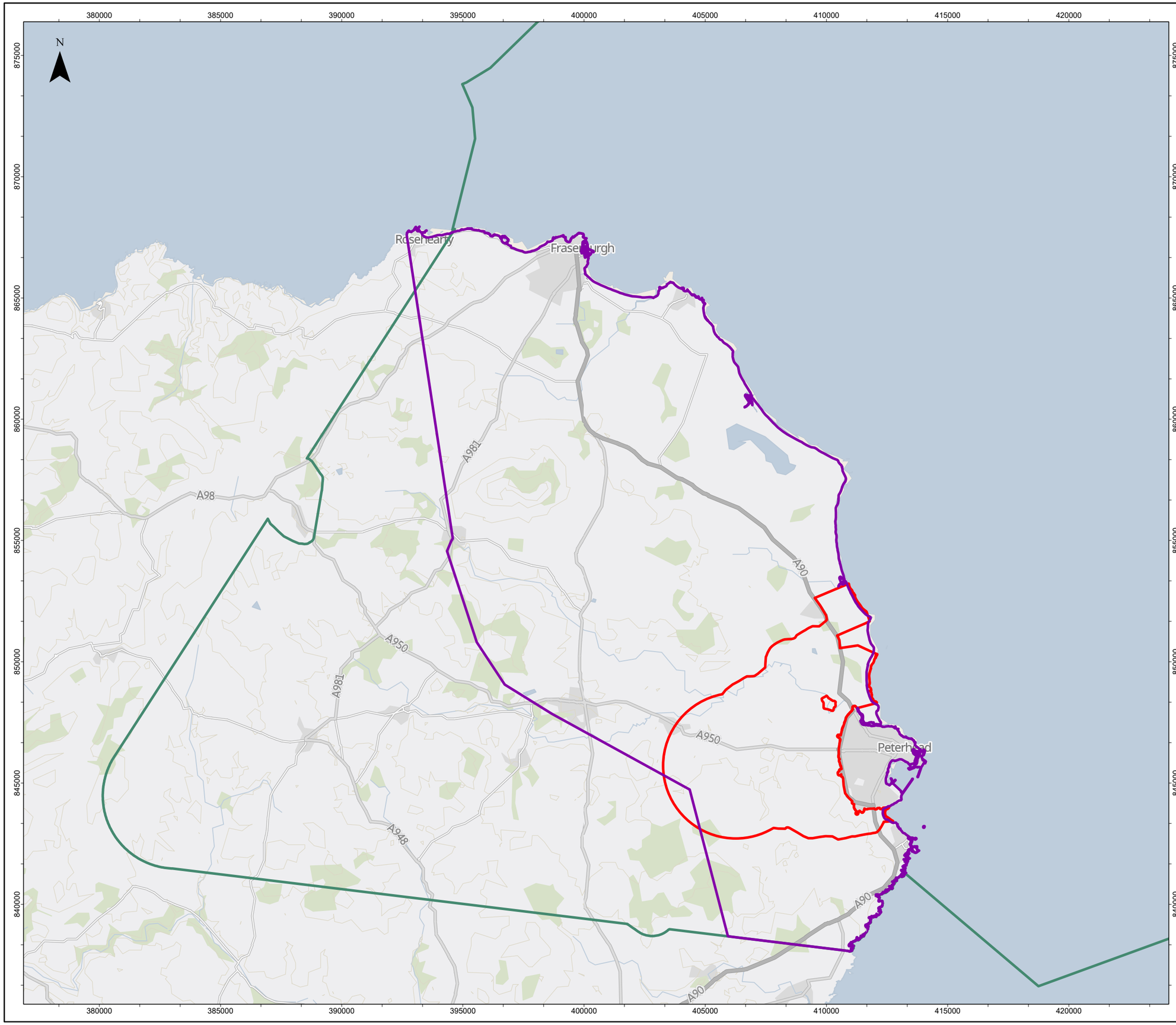
All watches lasted one hour except for one half-watch due to poor weather, marked with an asterisk (*), and one watch of one hour and four minutes due to continuing goose flight activity, marked with double asterisks (**). Times stated follow local time, i.e. are in GMT or BST as appropriate.

Table A.3 Flight Activity Survey Weather Conditions

Month	Kirkhill	Rattray	St Fergus	Cairnbulg	Coralhill	Memsie
September 2022	100% cloud cover, 15ºC, no precipitation, Beaufort wind force 4 west	100% cloud cover, 15ºC, no precipitation, Beaufort wind force 4 west	50% cloud cover, 17ºC, no precipitation, Beaufort wind force 4 west	95% cloud cover, 15ºC, no precipitation, Beaufort wind force 3 north	-	80% cloud cover, 12-15ºC, no precipitation, Beaufort wind force 3 southeast
October 2022	95% cloud cover, 10ºC, no precipitation, Beaufort wind force 2 southeast	95% cloud cover, 10ºC, no precipitation, Beaufort wind force 2 southeast	80% cloud cover, 13ºC, no precipitation, Beaufort wind force 2 north	90% cloud cover, 13ºC, no precipitation, Beaufort wind force 3 south	95% cloud cover, 14ºC, rain showers, Beaufort wind force 6-7 northwest	10% cloud cover, 15ºC, no precipitation, Beaufort wind force 6 south
November 2022	-	55% cloud cover, 15ºC, no precipitation, Beaufort wind force 6 southwest	20% cloud cover, 9ºC, no precipitation, Beaufort wind force 4 southwest	80% cloud cover, 2ºC, no precipitation, Beaufort wind force 3 north	80% cloud cover, 5ºC, rain, Beaufort wind force 1 north	90% cloud cover, 0ºC, moderate rain, Beaufort wind force 2 north
December 2022	80% cloud cover, 3ºC, no precipitation, Beaufort wind force 2-3 north	100% cloud cover, 3ºC, no precipitation, Beaufort wind force 3 north	100% cloud cover, 5ºC, no precipitation, Beaufort wind force 2 north	50% cloud cover, 3ºC, light rain, Beaufort wind force 3 north	70% cloud cover, 4ºC, no precipitation, Beaufort wind force 2 north	60% cloud cover, 3ºC, no precipitation, Beaufort wind force 3 north
January 2023	100% cloud cover, -1ºC, no precipitation, Beaufort wind force 2 north	10% cloud cover, -3ºC, no precipitation, Beaufort wind force 1 north	10% cloud cover, 0ºC, no precipitation, Beaufort wind force 1 north	50% cloud cover, 6ºC, no precipitation, Beaufort wind force 3 north-northeast	55% cloud cover, 7ºC, no precipitation, Beaufort wind force 3 north	95% cloud cover, 8ºC, light rain, Beaufort wind force 3 southwest
February 2023	10% cloud cover, 5ºC, no precipitation, Beaufort wind force 3 southwest	0% cloud cover, 5ºC, no precipitation, Beaufort wind force 3 southwest	20% cloud cover, 5ºC, no precipitation, Beaufort wind force 3 southwest	99% cloud cover, 6 to 7ºC, light rain showers, Beaufort wind force 2-3 southwest	10% cloud cover, 9ºC, no precipitation, Beaufort wind force 2 southwest	88% cloud cover, 8ºC, no precipitation, Beaufort wind force 2-4 southwest
March 2023	30% cloud cover, 13ºC, no precipitation,	50% cloud cover, 10ºC, no precipitation,	50% cloud cover, 9ºC, no precipitation,	90% cloud cover, 9ºC, no precipitation,	99% cloud cover, 12-13ºC, light rain	75% cloud cover, 11-12ºC, no precipitation,

Month	Kirkhill	Rattray	St Fergus	Cairnbulg	Coralhill	Memsie
	Beaufort wind force 2 south	Beaufort wind force 2 south	Beaufort wind force 1 south	Beaufort wind force 1 south	showers, Beaufort wind force 2-3 east	Beaufort wind force 2 north
April 2023	70% cloud cover, 3°C, no precipitation, Beaufort wind force 3 north	100% cloud cover, 8°C, light rain showers, Beaufort wind force 4 north	40% cloud cover, 3°C, no precipitation, Beaufort wind force 3 north	100% cloud cover, 8ºC, light rain showers, Beaufort wind force 4 south	100% cloud cover, 8ºC, light rain showers, Beaufort wind force 3-4 southeast	100% cloud cover, 5ºC, light rain showers, Beaufort wind force 2 southeast

Appendix B
Figures

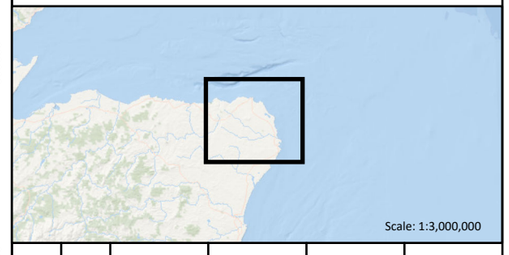


Wintering Geese Survey Study Area

Proposal of Application Notice Boundary

Scoping Boundary

0 2.5 5 7.5 Kilometres



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DATUM	OSGB 1936
PROJECTION	British National Grid
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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 1 Study area

Environmental Impact Assessment Report
Appendix 23.6

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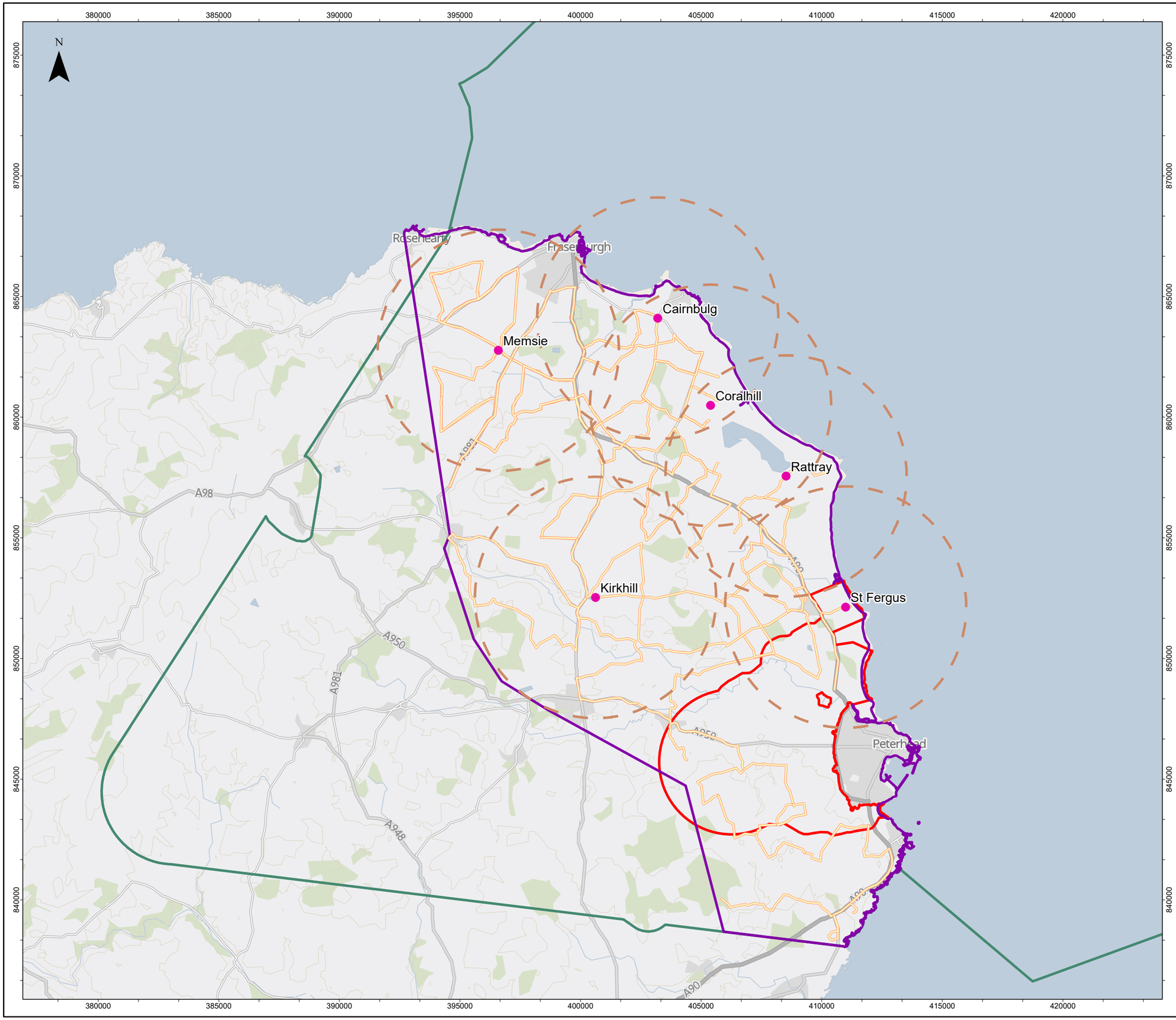


Wintering Geese Survey Study Area

Proposal of Application Notice Boundary

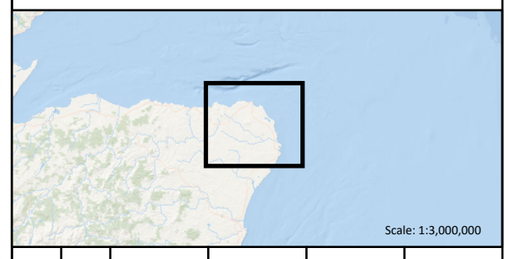
Scoping Boundary

Vantage points

Vantage points (5km buffer)

Driven transect

0 2.5 5 7.5 Kilometres



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PROJECT TITLE

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Figure 2 Driven transect and vantage points

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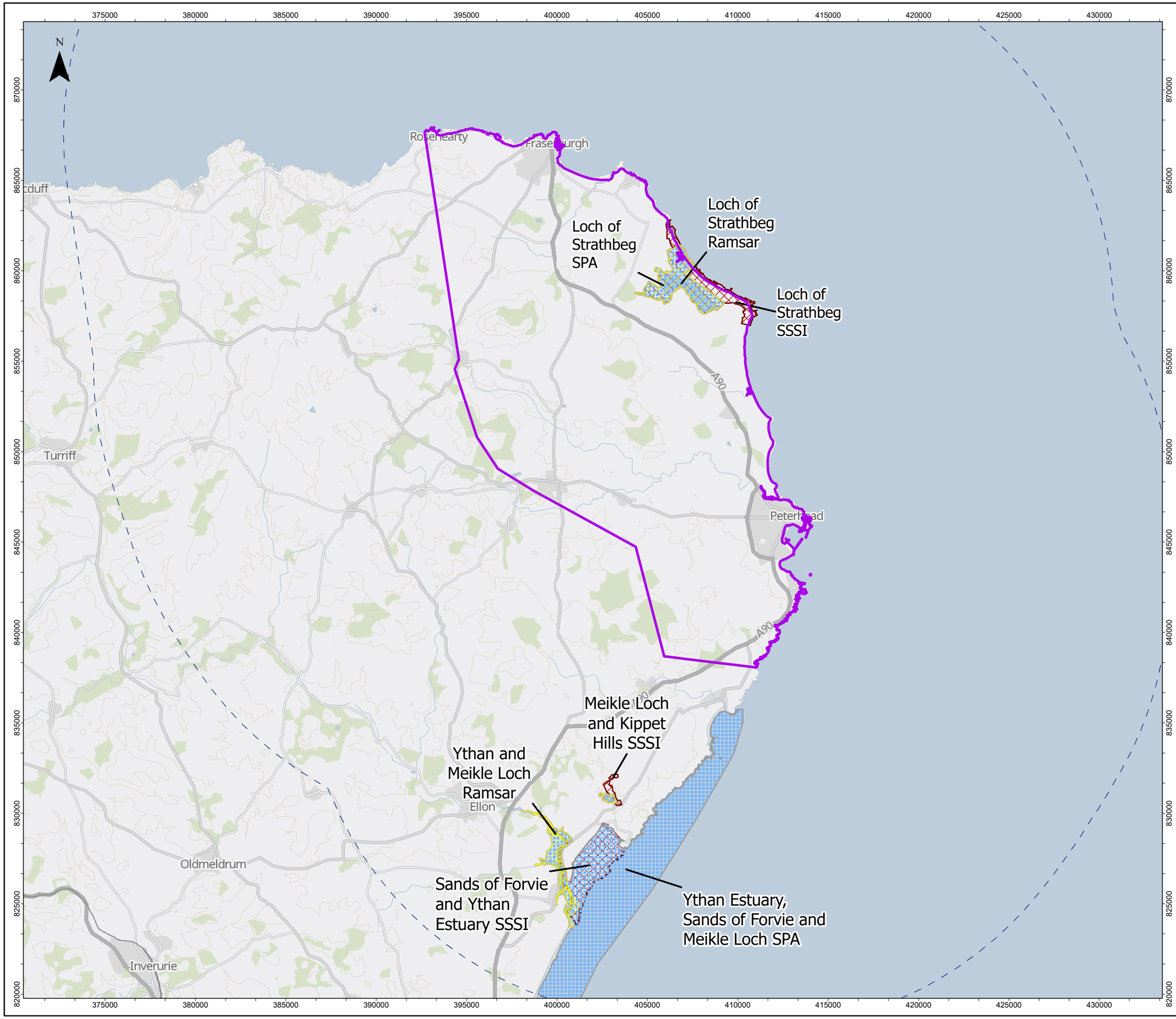


Wintering Geese Survey Study Area

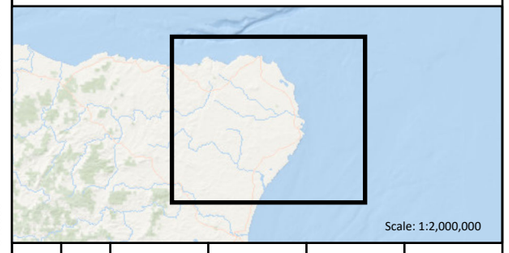
Wintering Geese Survey Study Area 20km Buffer

Ramsar Site

SPA

SSSI

0 2 4 6 8 10 Kilometres



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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 3 Designated sites within study area

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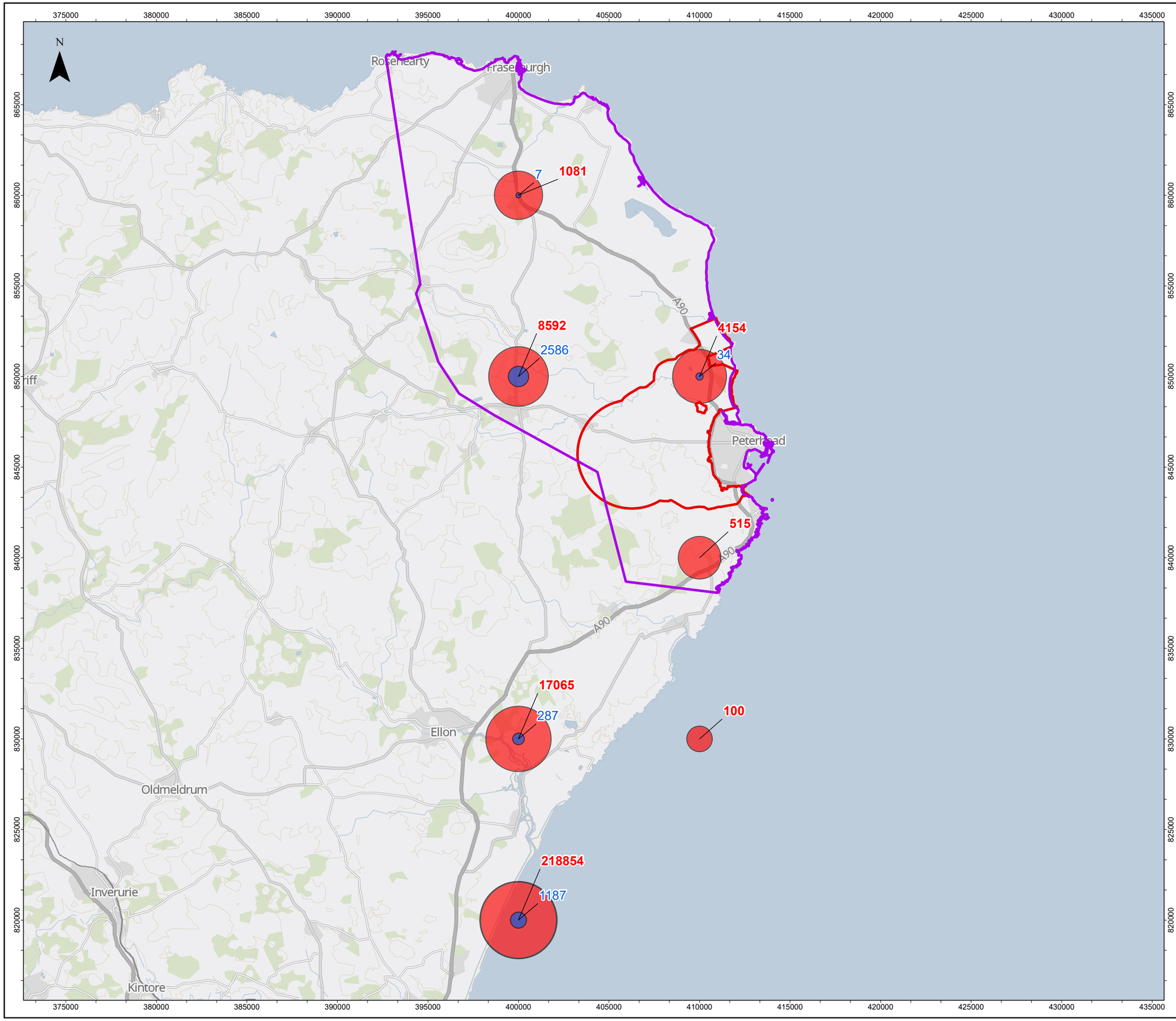


Wintering Geese Survey Study Area

Onshore Proposed Application Notice Boundary

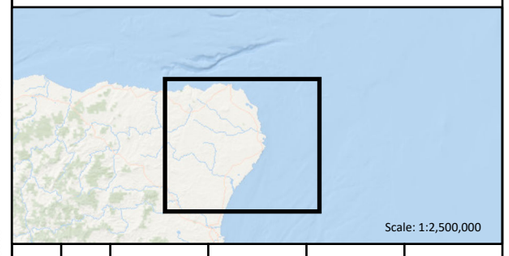
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000

No. of Pink-footed Goose

- 1 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- >25001

0 10 Kilometres



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PROJECT TITLE

MarramWind Offshore Wind Farm

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Figure 4 Qualifying goose and swan records (10km resolution)

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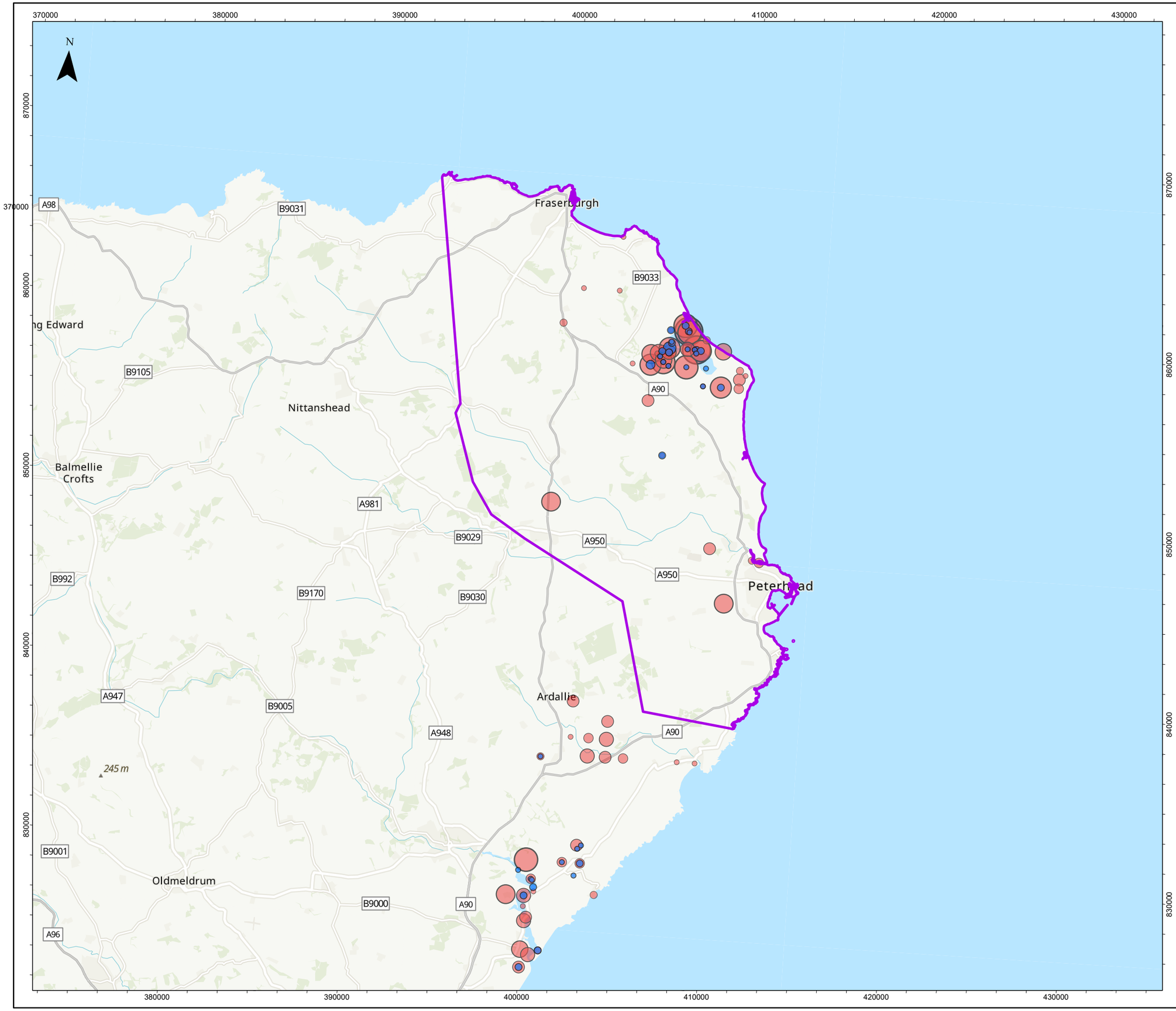


Wintering Geese Survey Study Area

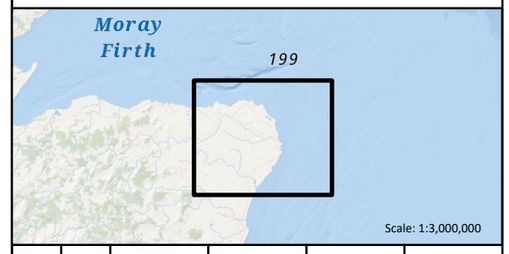
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000

0 10 Kilometres



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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 5 Qualifying goose and swan records (September)

Environmental Impact Assessment Report
Appendix 23.6

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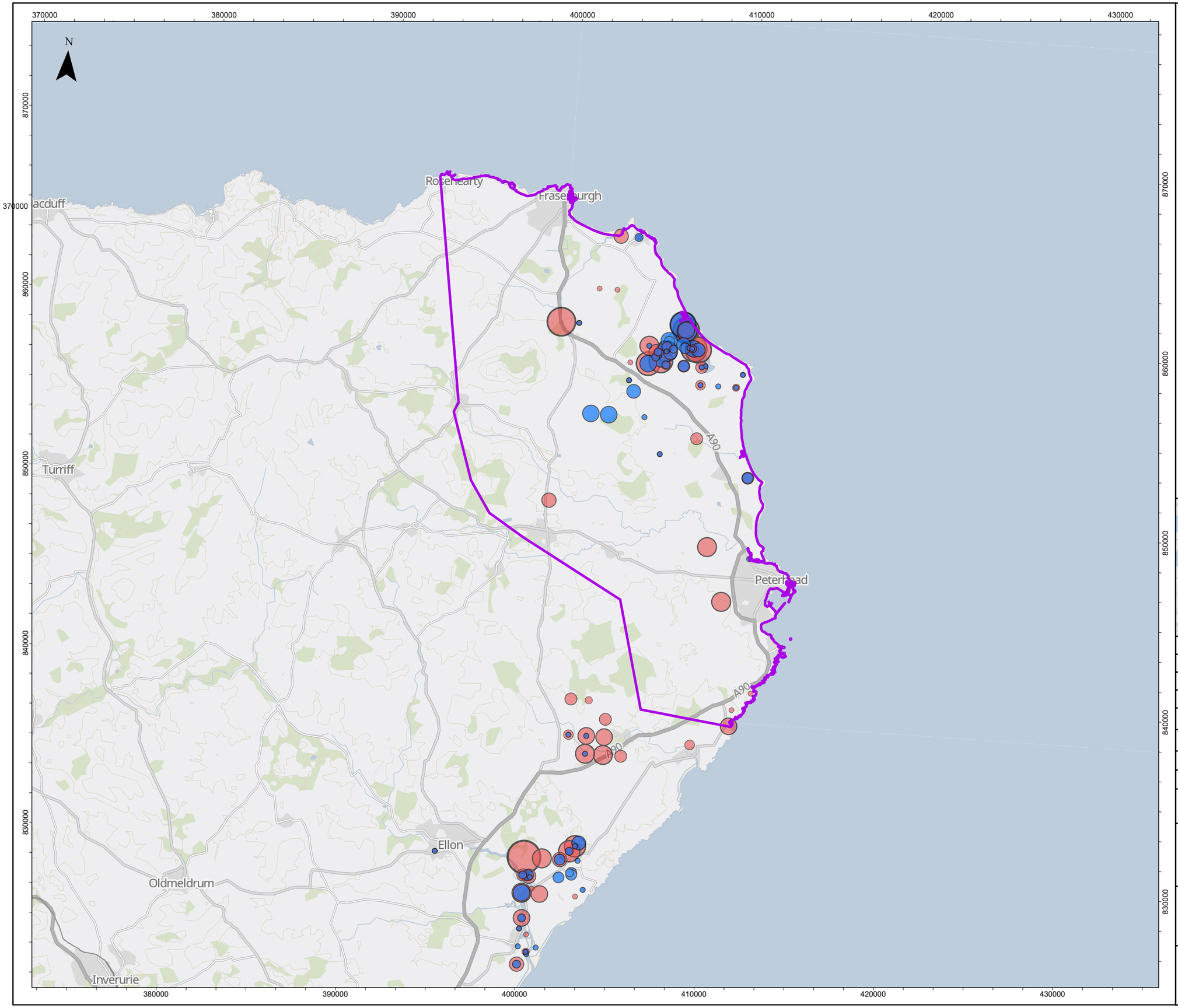


Wintering Geese Survey Study Area

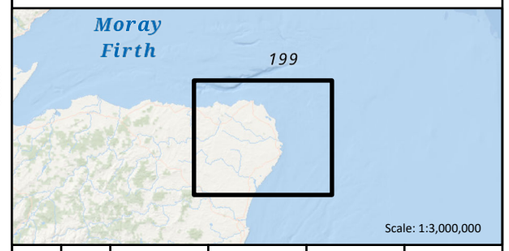
No. of Wooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000

No. of Pink Footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000
- 50001 - 100000
- 100001 - 150000

0 10 Kilometres



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PROJECT TITLE
MarramWind Offshore Wind Farm

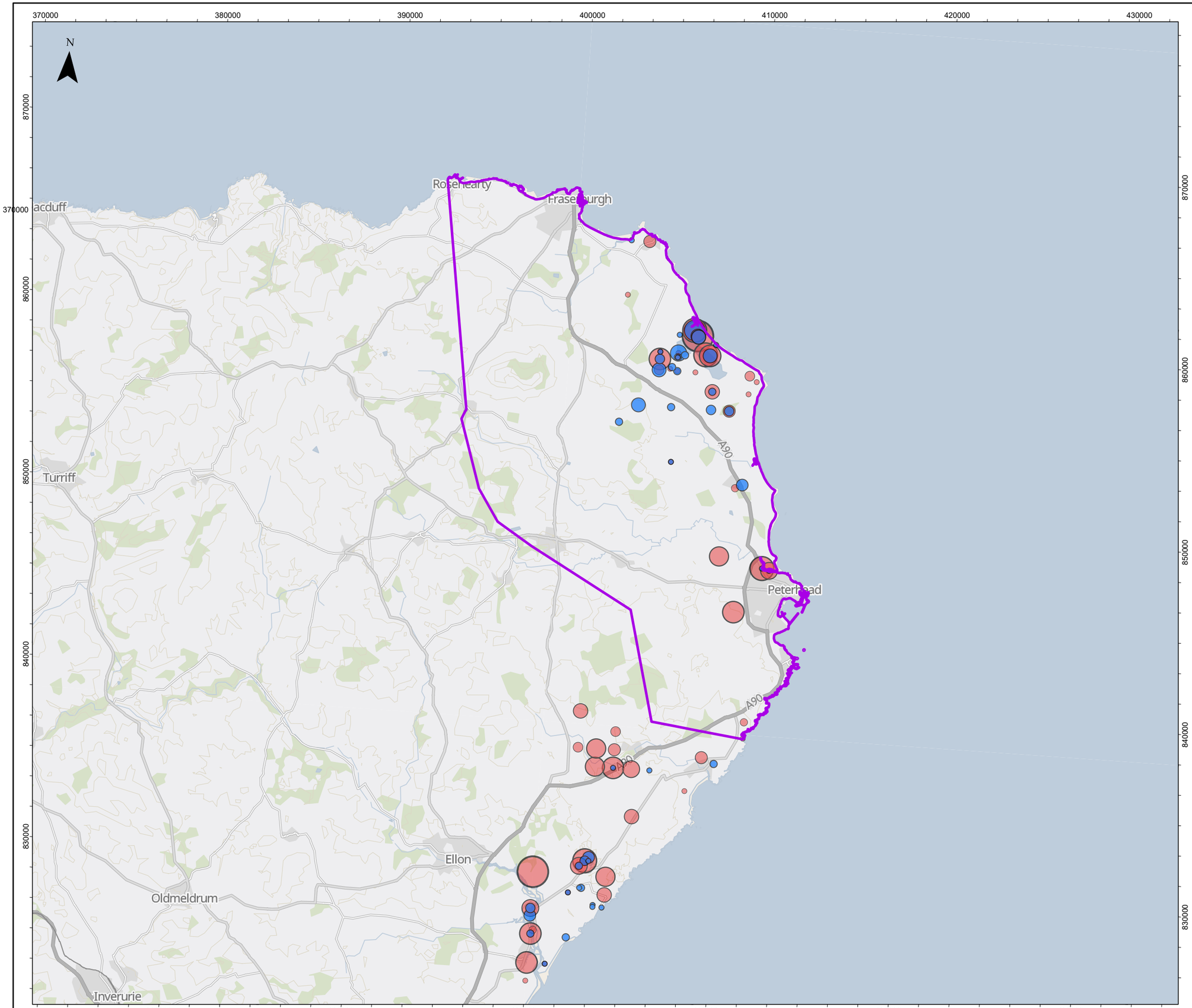
DRAWING TITLE

Figure 6 Qualifying goose and swan records (October)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

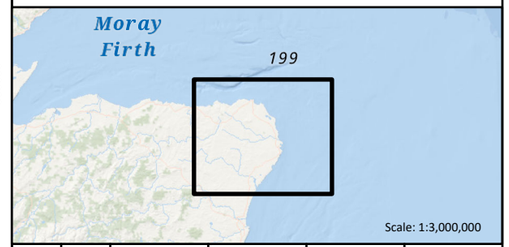
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000
- 50001 - 100000

0 — 10 Kilometres



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DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:200,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

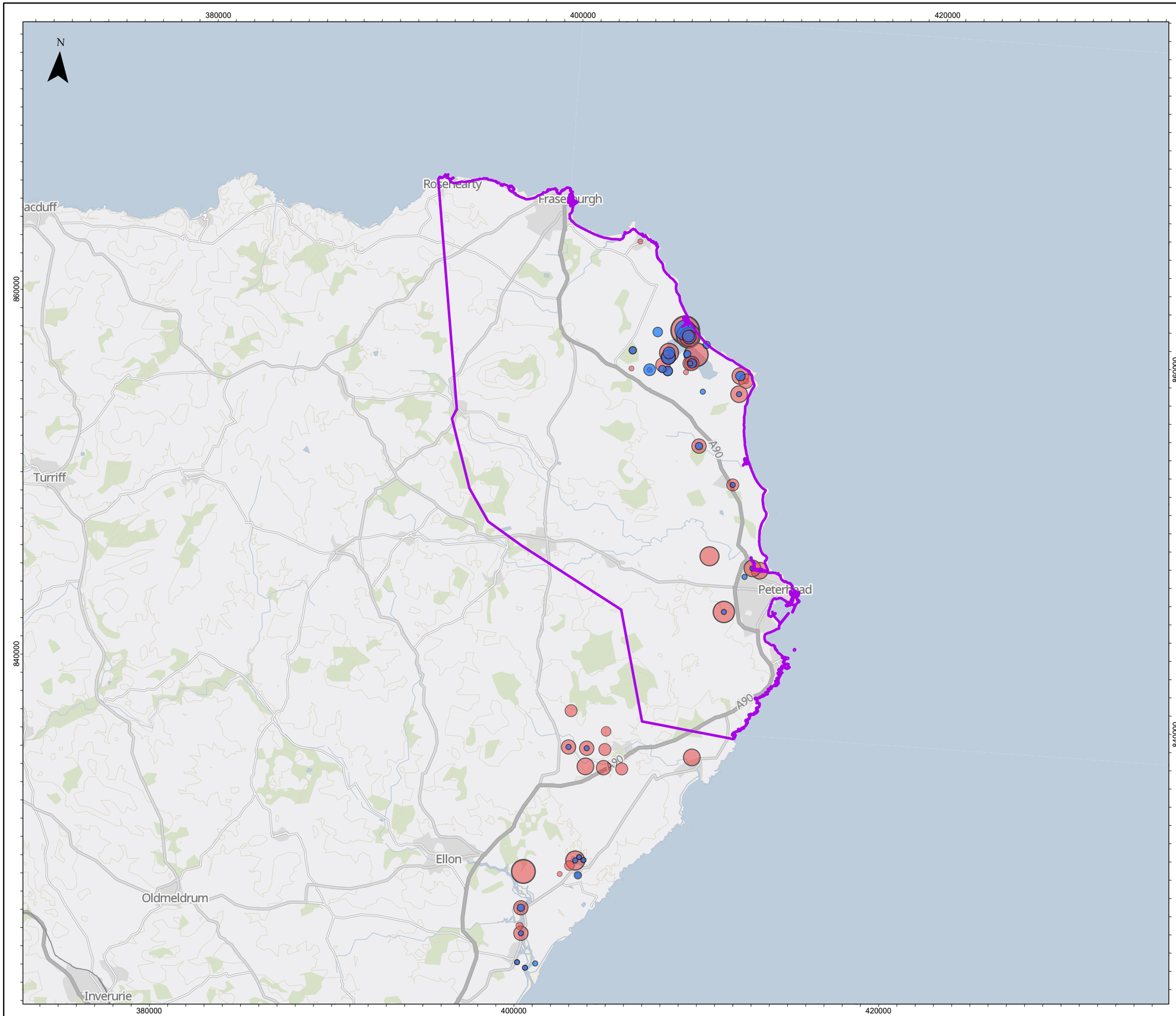
Figure 7 Qualifying goose and swan records (November)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp

MarramWind



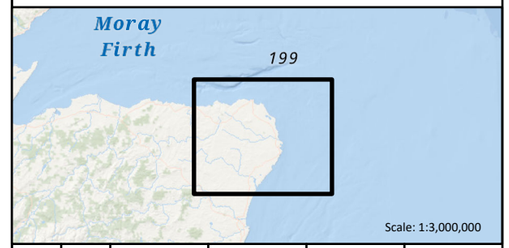
Wintering Geese Survey Study Area

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000

No. of Pink Footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000

0 10 Kilometres



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DATUM: OSGB 1936	PROJECTION: British National Grid
SCALE: 1:200,000	PAGE SIZE: A3

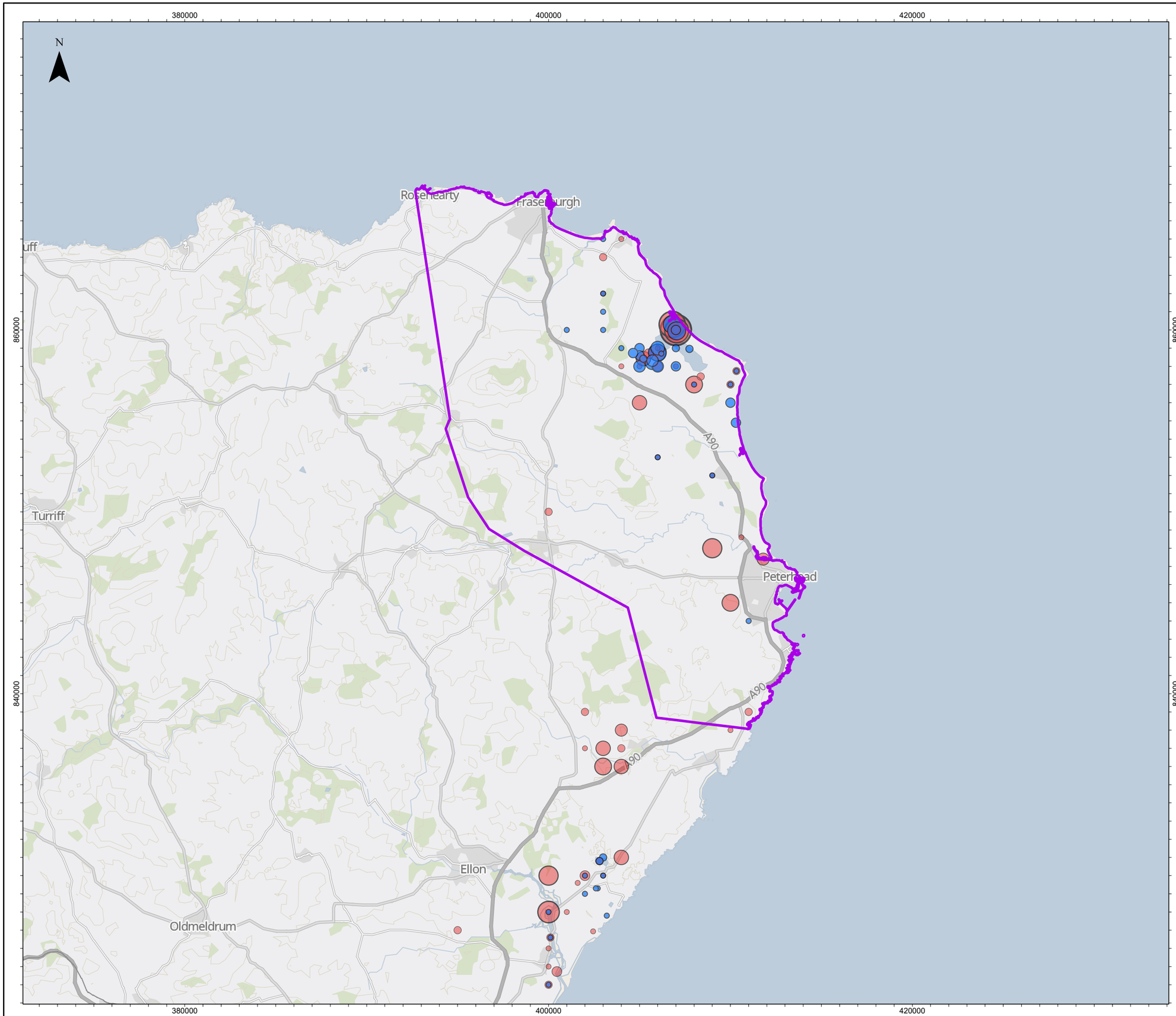
PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 8 Qualifying goose and swan records (December)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

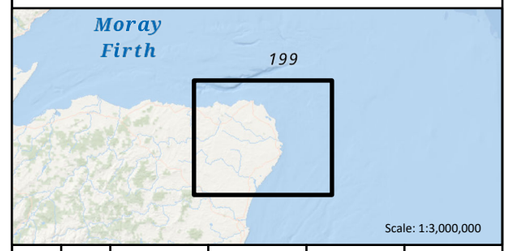
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000
- 50001 - 100000

0 10 Kilometres



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DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:200,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

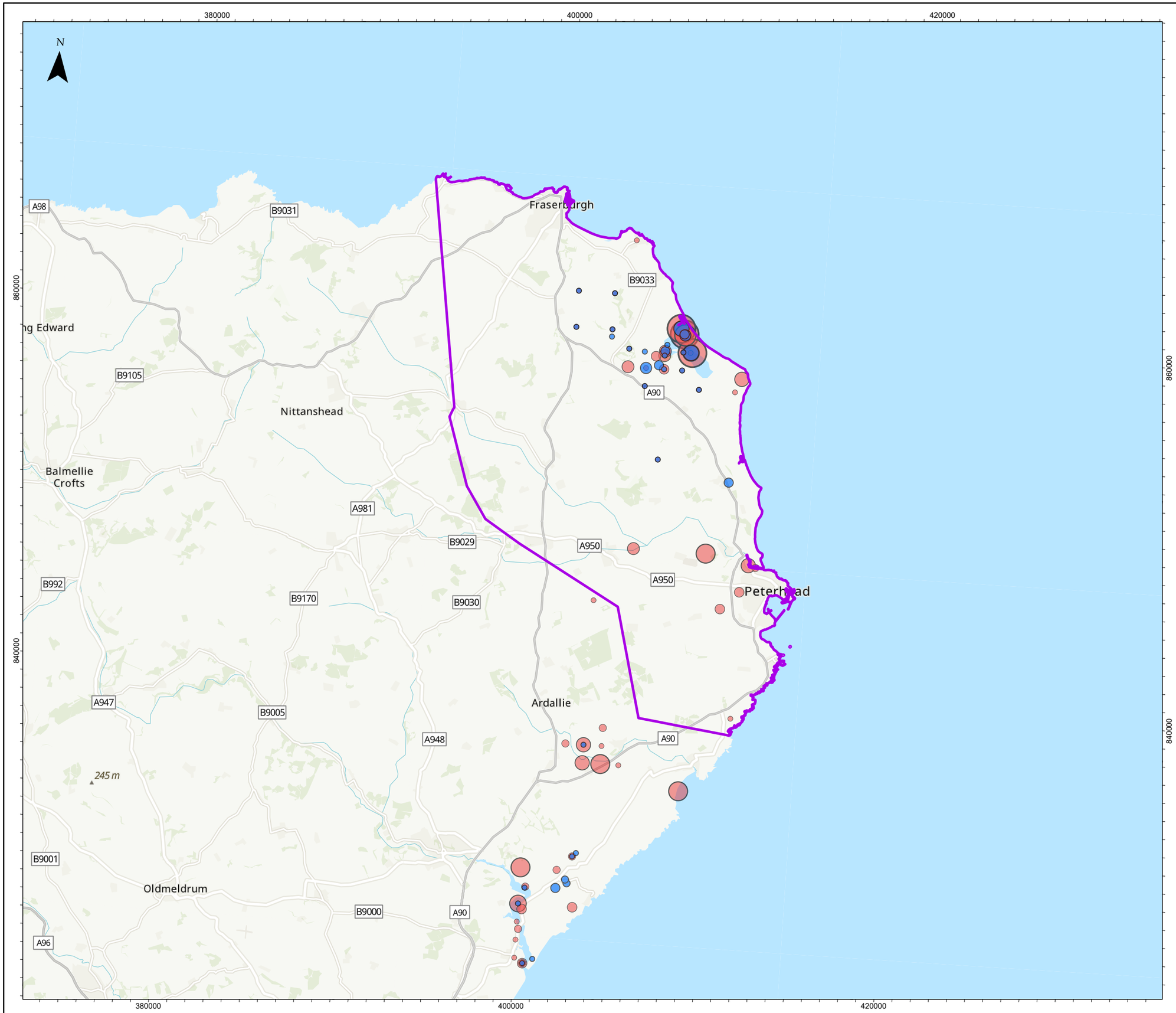
DRAWING TITLE

Figure 9 Qualifying goose and swan records (January)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

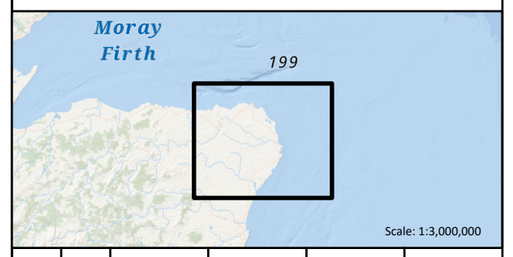
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000

0 10 Kilometres



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REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

WSP DRAWING NUMBER 808368-WEIS-IA-S6-FG-O6-21577

MarramWind DRAWING NUMBER MAR-GEN-ENV-REP-WSP-000001

DATUM OSGB 1936 | PROJECTION British National Grid

SCALE 1:200,000 | PAGE SIZE A3

PROJECT TITLE
MarramWind Offshore Wind Farm

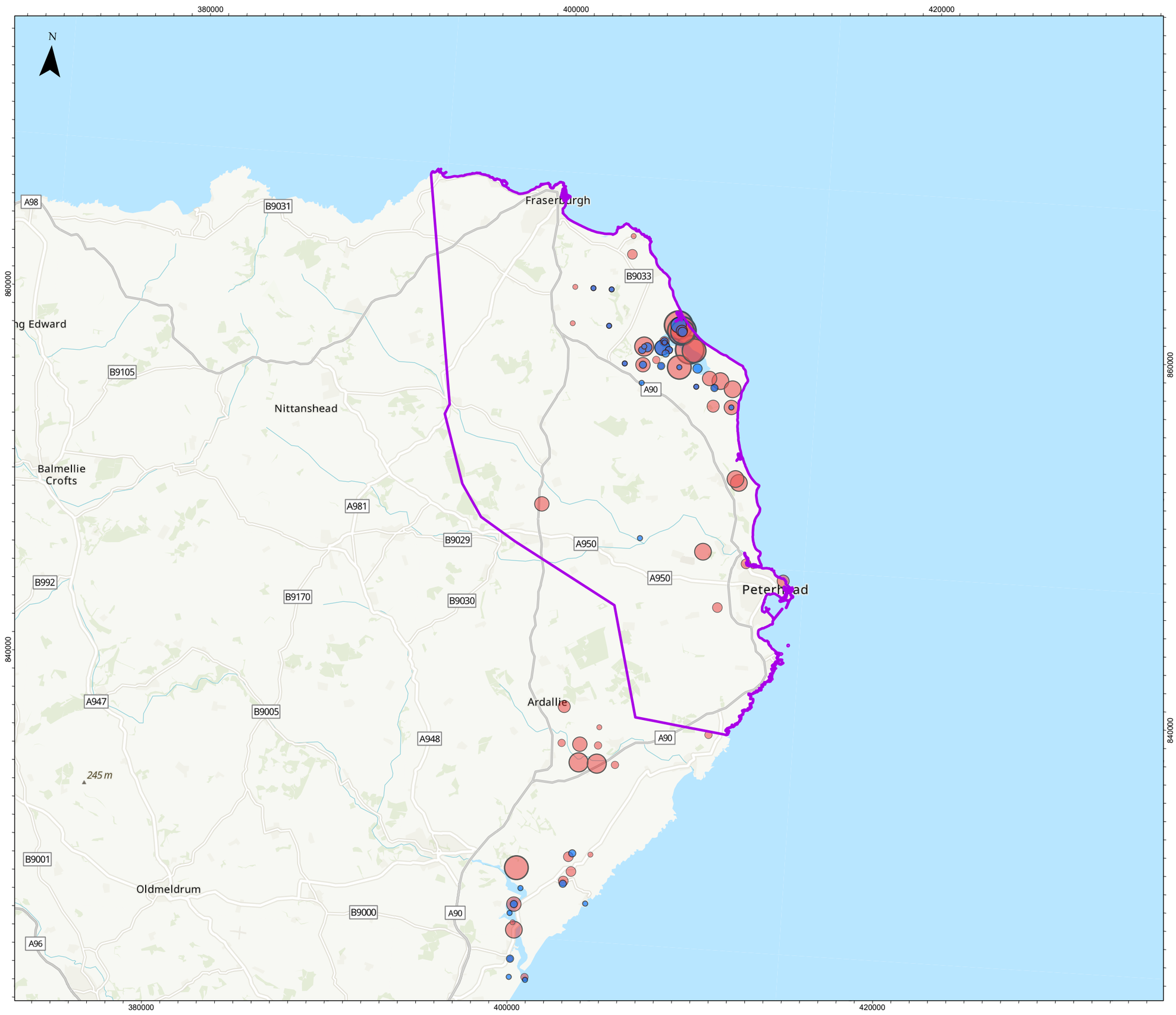
DRAWING TITLE

Figure 10 Qualifying goose and swan records (February)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

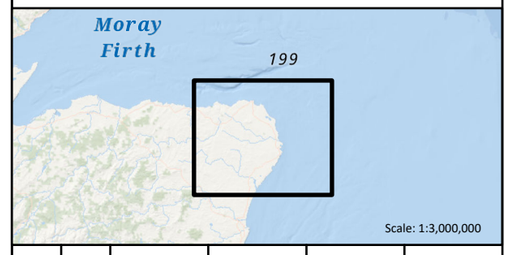
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000

0 10 Kilometres



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MarramWind DRAWING NUMBER	MAR-GEN-ENV-REP-WSP-000001		
DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:200,000	PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

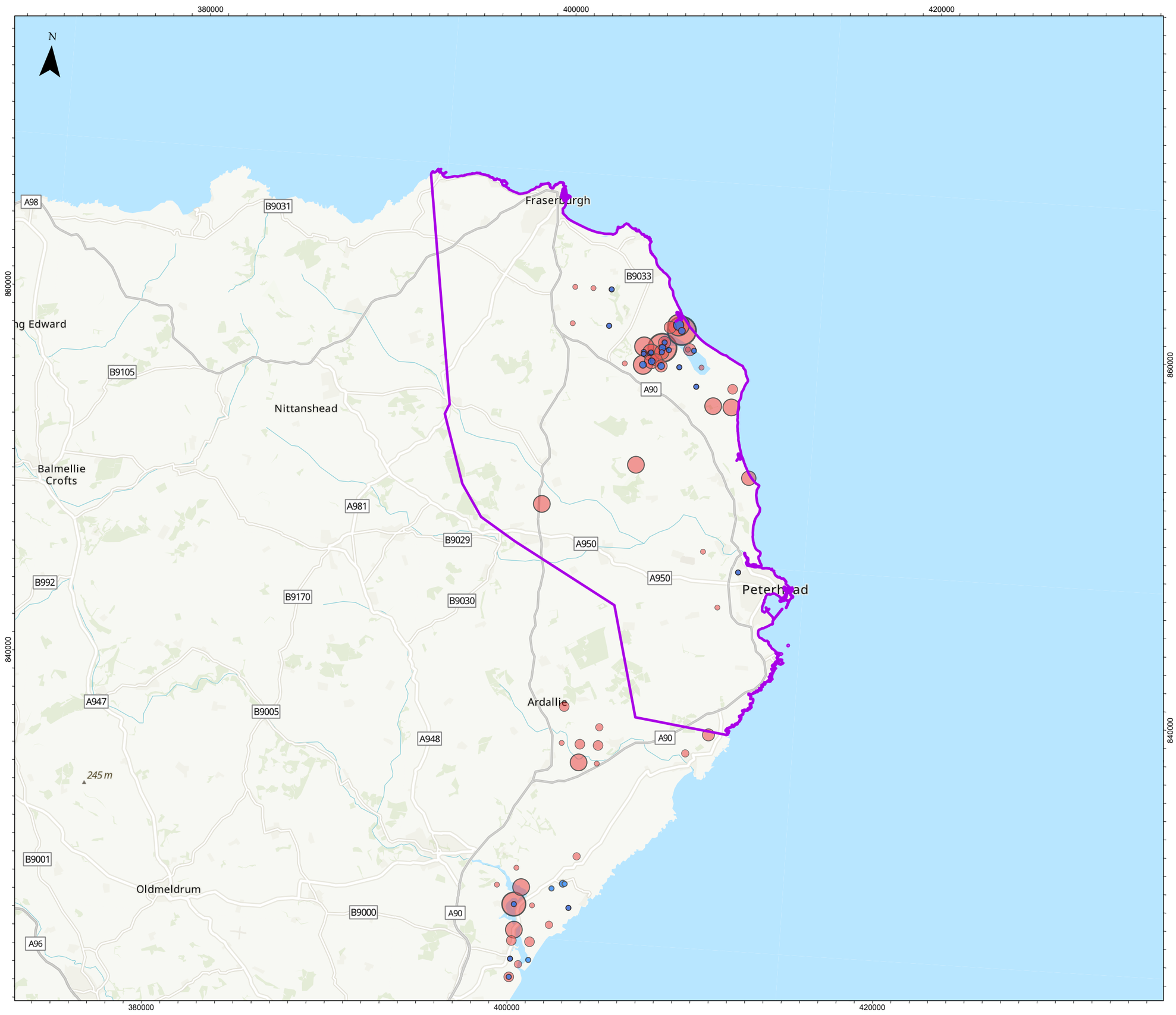
DRAWING TITLE

Figure 11 Qualifying goose and swan records (March)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

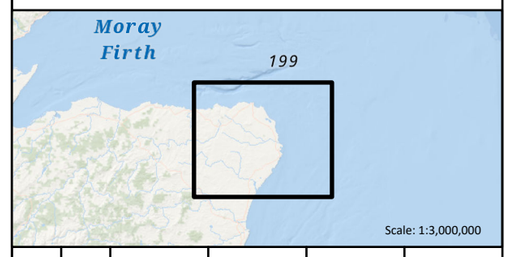
No. of Whooper Swan

- 1 - 25
- 26 - 100
- 101 - 250

No. of Pink-footed Goose

- 1 - 25
- 26 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 - 10000
- 10001 - 25000
- 25001 - 50000

0 10 Kilometres



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DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:200,000	PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

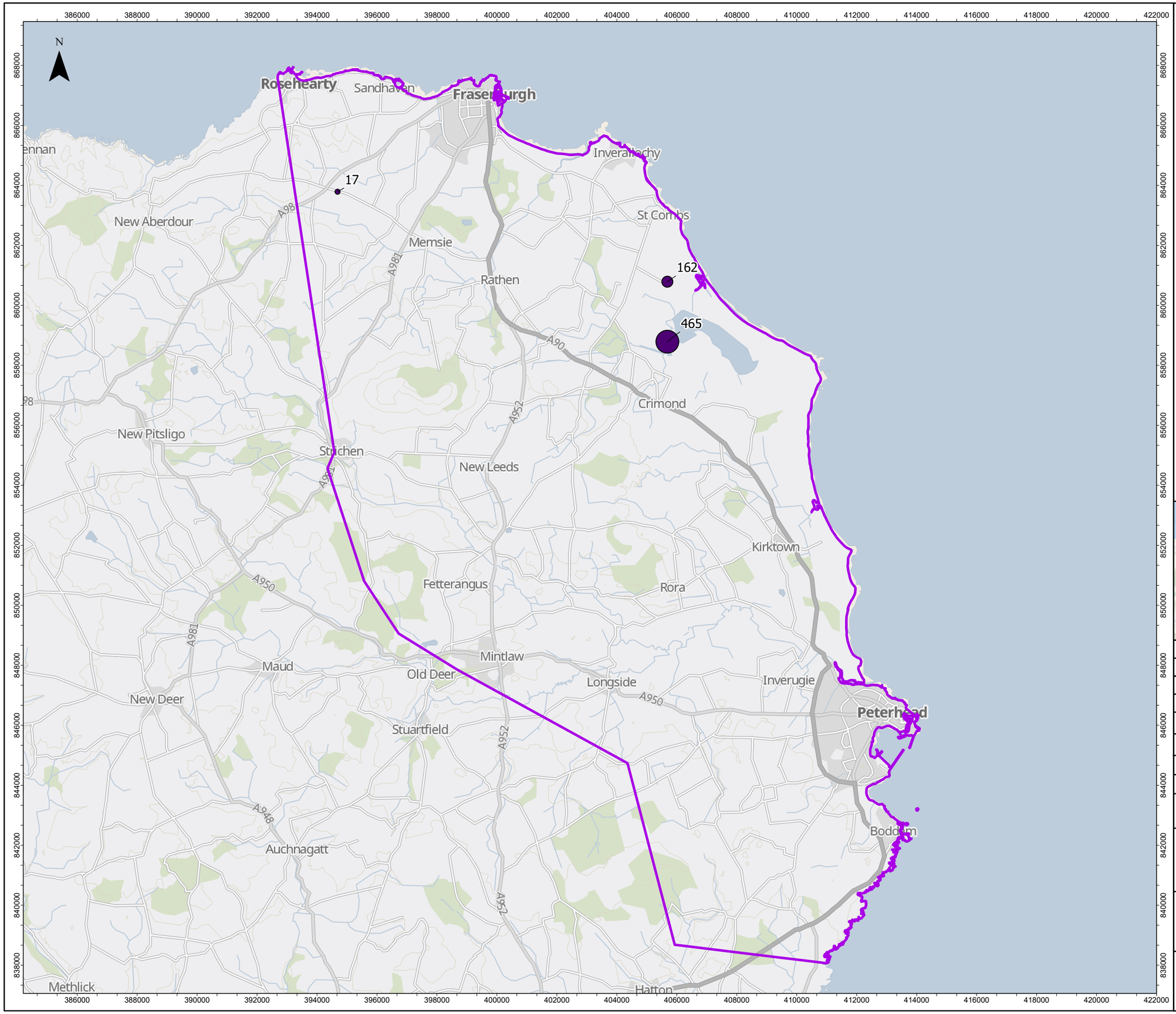
DRAWING TITLE

Figure 12 Qualifying goose and swan records (April)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

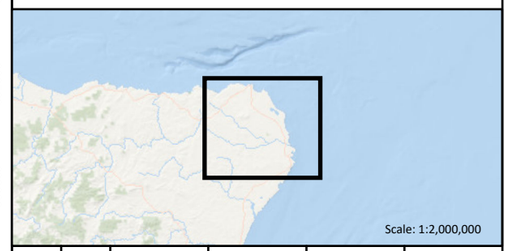


Wintering Geese Survey Study Area

Geese and Swans September 2022

- 17
- 162
- 465

0 5 Kilometres



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REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

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MarramWind DRAWING NUMBER	MAR-GEN-ENV-REP-WSP-000001		
DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

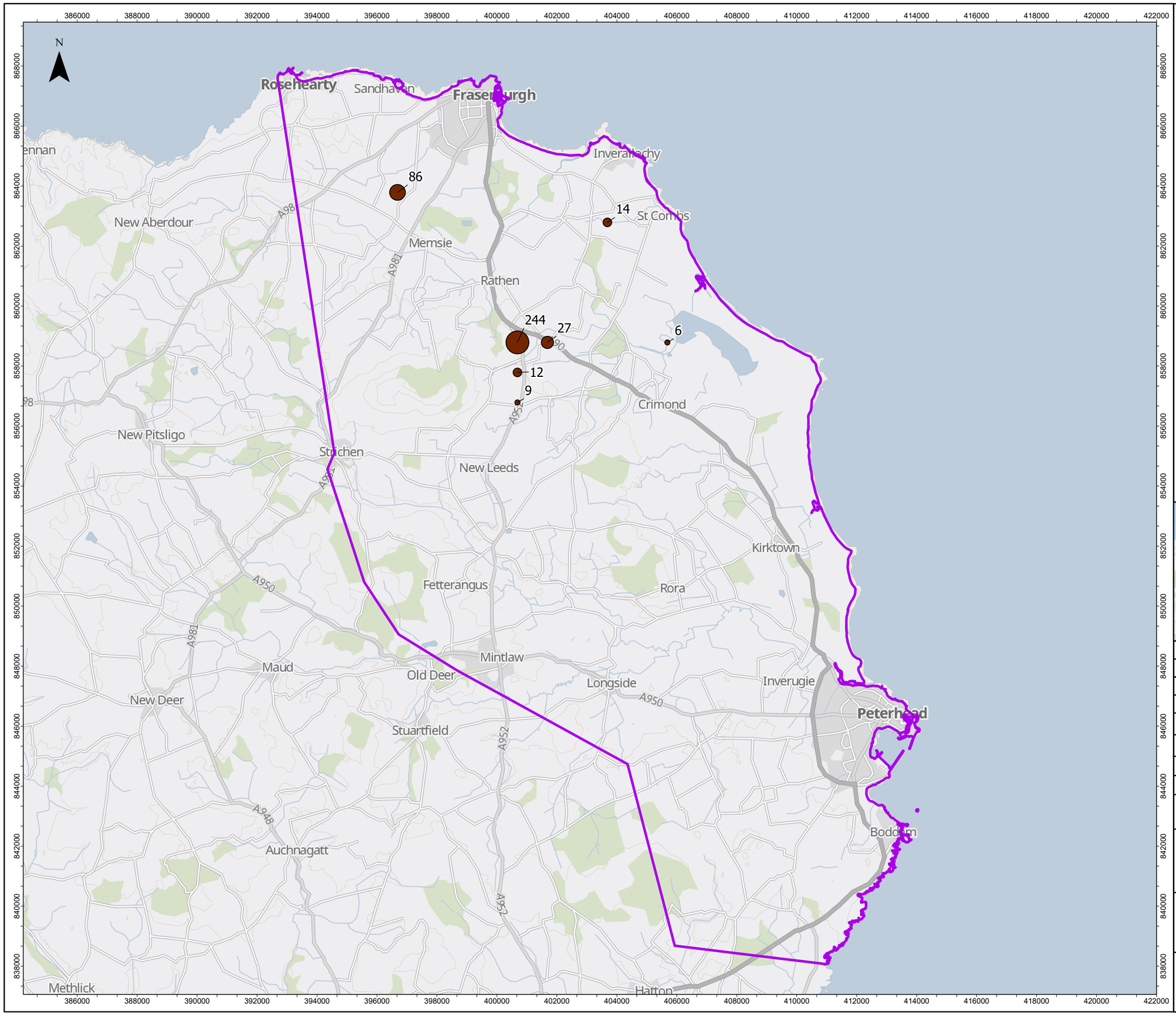
PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 13 Occurrence of geese and swans (September 2022)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

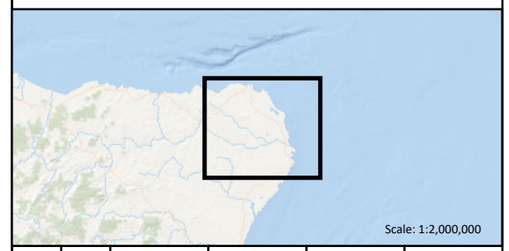


Wintering Geese Survey Study Area

Geese and Swans October 2022

- < 10
- 11 - 14
- 15 - 27
- 28 - 86
- 87 - 244

0 5 Kilometres



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REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

WSP DRAWING NUMBER	808368-WEIS-IA-S6-FG-O6-14714		
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DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

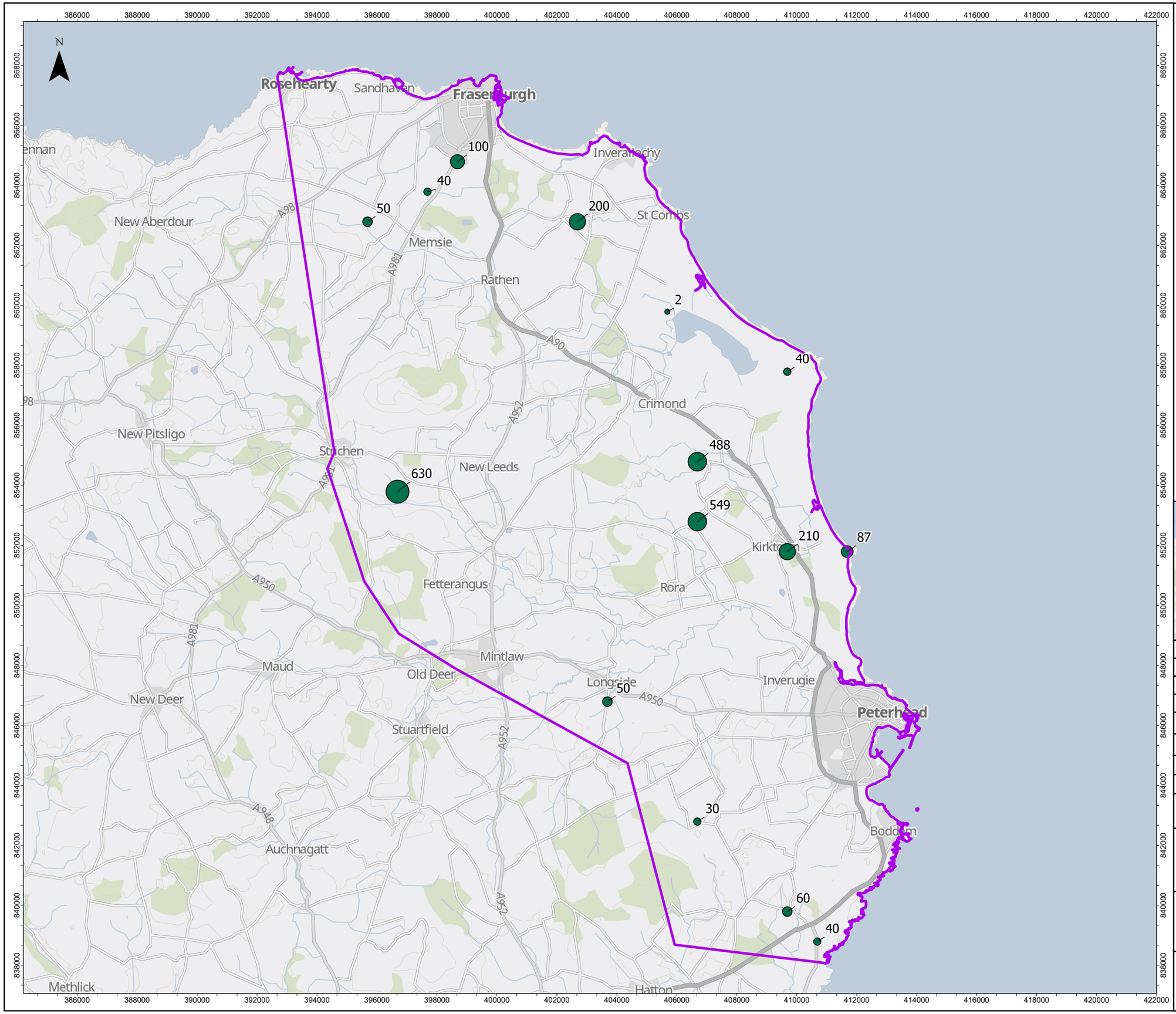
PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 14 Occurrence of geese and swans (October 2022)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

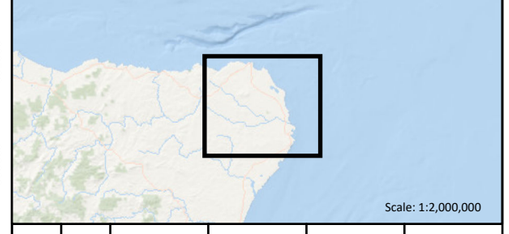


Wintering Geese Survey Study Area

Geese and Swans November 2022

- 2
- 3 - 40
- 41 - 60
- 61 - 87
- 88 - 100
- 101 - 210
- 211 - 549
- 550 - 630

0 5 Kilometres



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REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

WSP DRAWING NUMBER	808368-WEIS-IA-S6-FG-O6-14714		
MarramWind DRAWING NUMBER	MAR-GEN-ENV-REP-WSP-000001		
DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 15 Occurrence of geese and swans (November 2022)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

N

Wintering Geese Survey Study Area

Geese and Swans December 2022

- 1 - 7
- 8 - 12
- 13 - 25
- 26 - 300
- 301 - 500

0 5 Kilometres

Scale: 1:2,000,000

	dd/mm/yyyy	--	--	--	--
	dd/mm/yyyy	--	--	--	--
1	28/02/2024	LT	AMc	AM	MW
REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

WSP DRAWING NUMBER	808368-WEIS-IA-S6-FG-O6-14714
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DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:120,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

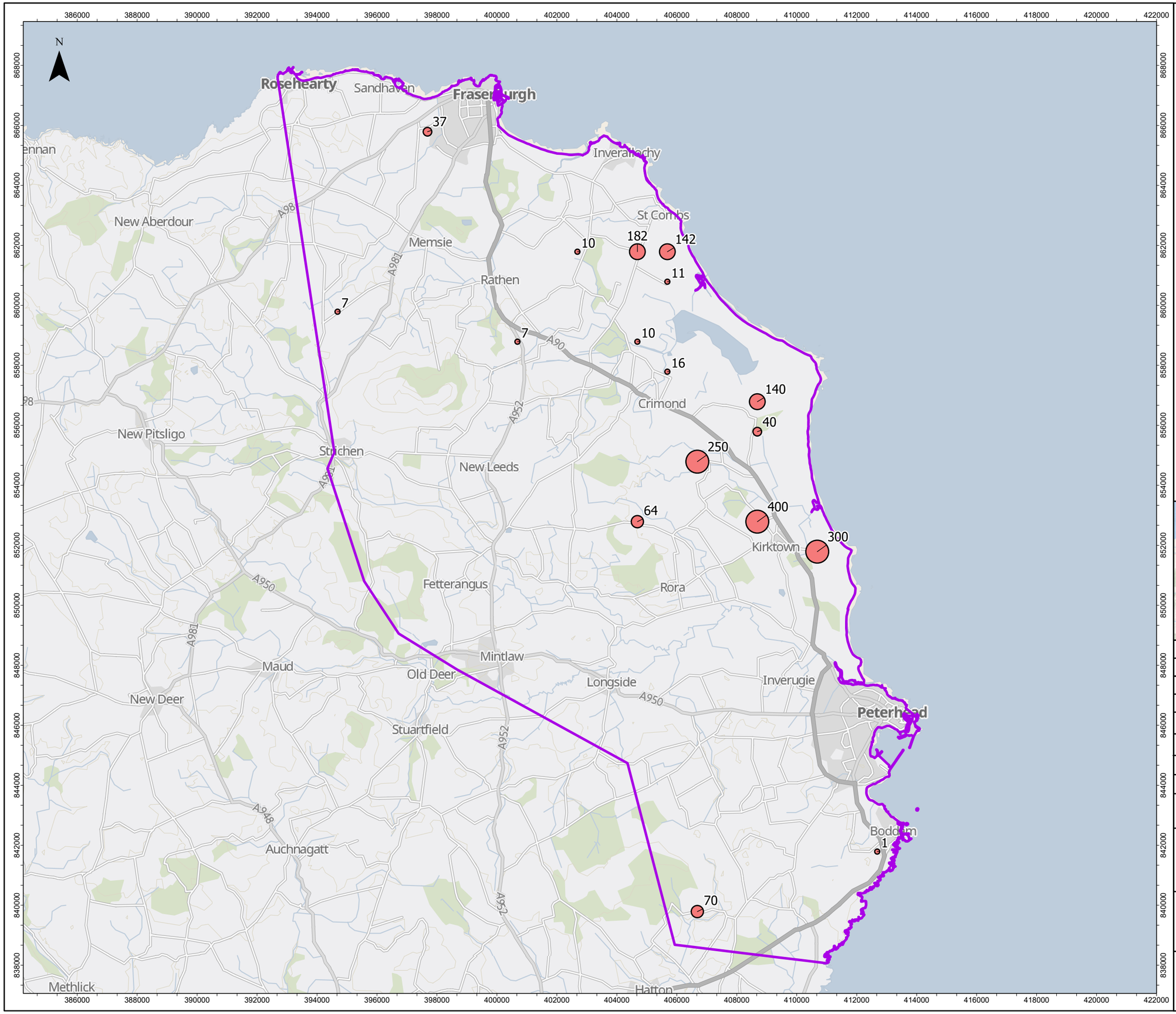
DRAWING TITLE

Figure 16 Occurrence of geese and swans (December 2022)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

WSP MarramWind

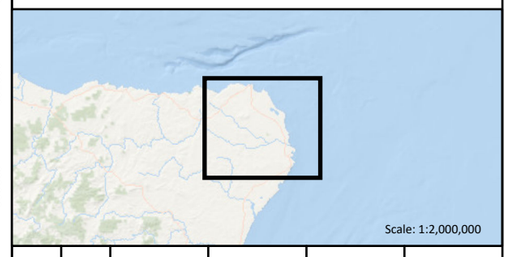


Wintering Geese Survey Study Area

Geese and Swans January 2023

- 1 - 16
- 17 - 40
- 41 - 70
- 71 - 182
- 183 - 400

0 5 Kilometres



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DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

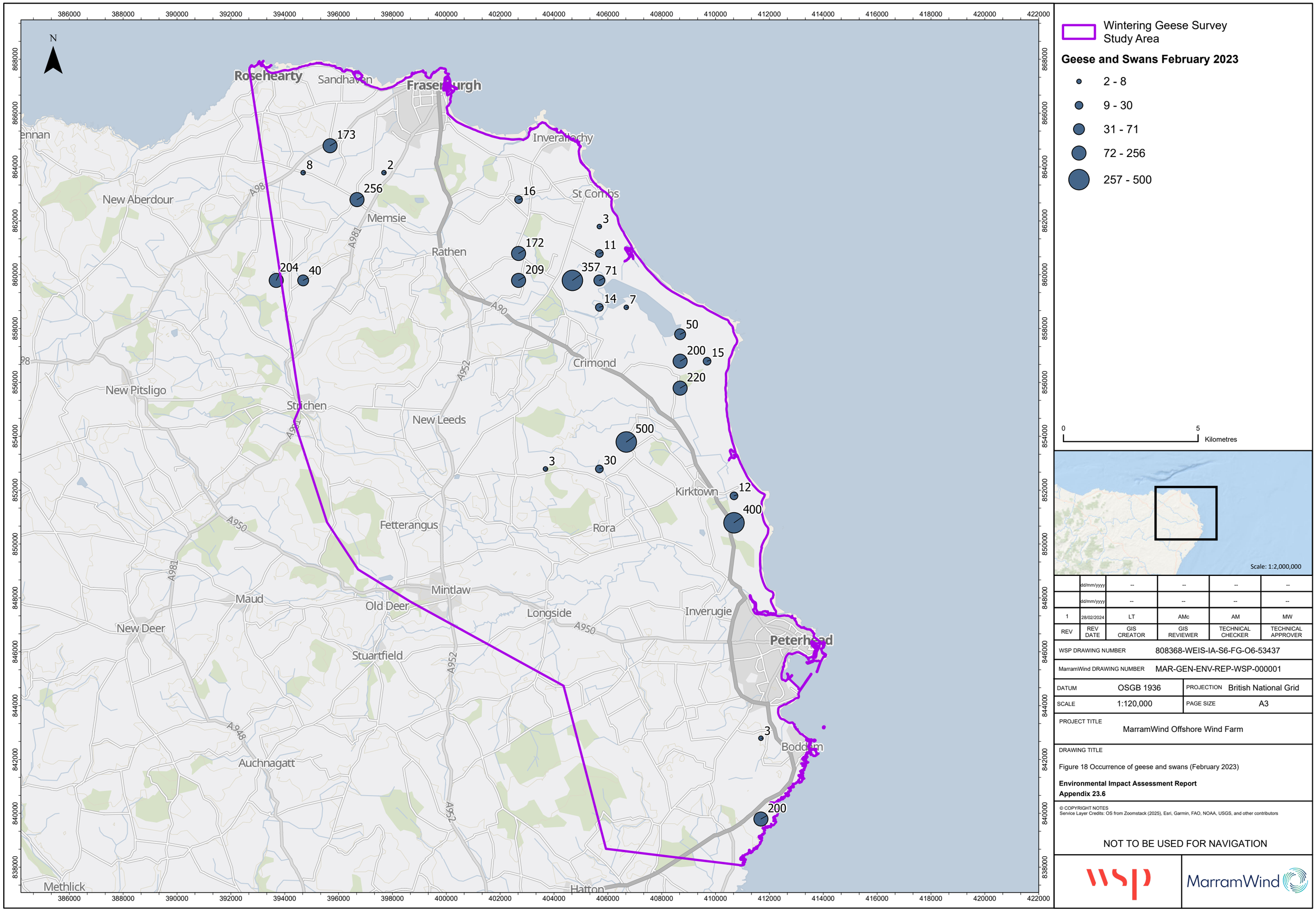
PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 17 Occurrence of geese and swans (January 2023)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



Wintering Geese Survey Study Area

Geese and Swans February 2023

- 2 - 8
- 9 - 30
- 31 - 71
- 72 - 256
- 257 - 500

REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
	dd/mm/yyyy	--	--	--	--
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DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 18 Occurrence of geese and swans (February 2023)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

N

Wintering Geese Survey Study Area

Geese and Swans March 2023

- 6 - 38
- 39 - 110
- 111 - 133
- 134 - 256
- 257 - 480

0 5 Kilometres

Scale: 1:2,000,000

	dd/mm/yyyy	--	--	--	--
	dd/mm/yyyy	--	--	--	--
1	28/02/2024	LT	AMc	AM	MW
REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

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DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:120,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

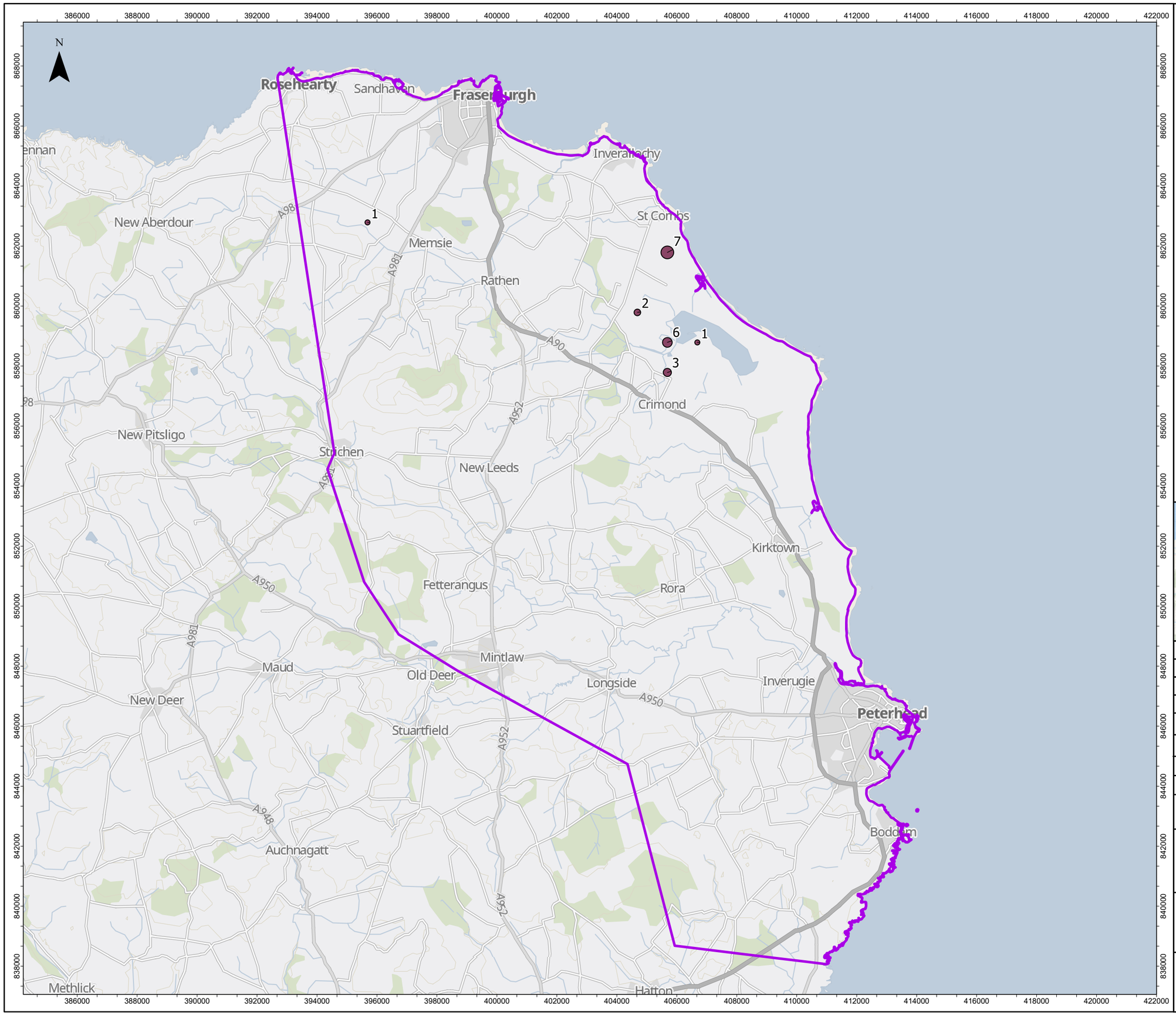
Figure 19 Occurrence of geese and swans (March 2023)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

WSP

MarramWind

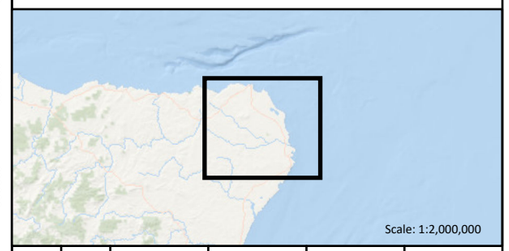


Wintering Geese Survey Study Area

Geese and Swans April 2023

- 1
- 2
- 3
- 4 - 6
- 7

0 5 Kilometres



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MarramWind DRAWING NUMBER	MAR-GEN-ENV-REP-WSP-000001

DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 20 Occurrence of geese and swans (April 2023)

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

N

Wintering Geese Survey Study Area

Large Waterfowl Count

September
October
November
December
January
February
March
April

750
380
1

0 5 Kilometres

Scale: 1:2,000,000

	dd/mm/yyyy	--	--	--	--
	dd/mm/yyyy	--	--	--	--
1	28/02/2024	LT	AMc	AM	MW
REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

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MarramWind DRAWING NUMBER	MAR-GEN-ENV-REP-WSP-000001		
DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:120,000	PAGE SIZE	A3

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 21 Combined geese and swan distribution map

Environmental Impact Assessment Report
Appendix 23.6

NOT TO BE USED FOR NAVIGATION

wsp MarramWind

MarramWind