



BERWICK BANK WIND FARM OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT

APPENDIX 11.2: INTERTIDAL, NEARSHORE AND OFFSHORE CABLE CORRIDOR ORNITHOLOGY REPORT



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1. INTRODUCTION

1.1. PURPOSE AND SCOPE OF THE REPORT

1. This report considers:

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- The results of intertidal and nearshore surveys undertaken to inform the assessment of the Proposed Development of the Offshore Transmission Works cable landfall associated with the Berwick Bank Wind Farm; and
- Characterises the predicted seabird interests likely to be encountered offshore along the Offshore
 Transmission Works cable corridor from nearshore to the Berwick Bank Wind Farm Array Area, using
 pre-existing published datasets on seabird distribution and density and results from digital aerial
 surveys commissioned by SSE.
- 2. The main objectives of these surveys and desk studies are therefore to identify:
 - Any areas which support significant numbers of qualifying species of the various coastal/marine designated sites in the relevant Special Protection Areas (SPAs);
 - Any areas which are of importance for large assemblages of birds; and
 - Seasonal periods of sensitivity for birds (e.g. staging posts for migratory birds or traditional feeding and roosting grounds).
- 3. The purpose of the resulting baseline characterisation is to help inform the Environmental Impact Assessment (EIA) for the Berwick Bank Wind Farm as well as the Habitats Regulations Appraisal (HRA) required in relation to internationally important designated sites.
- 4. The report is divided into seven sections. Following this Introduction, 1.2 explains the survey and desk study methods used to collect intertidal and nearshore bird data, results of which are provided in section 1.3. Section 1.4 considers the survey result findings in comparison to data from the Wetland Bird Survey. Section 1.5 provides the ornithological characterisation of the export cable corridor beyond the nearshore environment. Findings specifically in relation to Special Protection Areas (SPAs) are summarised in section 1.6 and the report ends with an overall summary and conclusions in section 1.7.
- 5. It should be noted that the Proposed Berwick Bank Wind Farm has been updated and refined since the commencement of surveys and the drafting of this technical report. Such changes include the removal of the most southerly landfall option at Thorntonloch; these changes are not reflected in this report as survey data has still been collected and provides useful detail and context. Furthermore, changes to the onshore project boundary have also not been reflected in the report and the current onshore boundary illustrates the area of search for the onshore site at the time of EIA Scoping with East Lothian Council. However, the results from the surveys will be applied to the current offshore site boundary (from Mean High Water Springs seaward) as part of the offshore EIA Report (EIAR) for which consent is being sought from Marine Scotland.
- 6. This report has been produced by RPS' Ornithology Team, on behalf of SSE. Team members have considerable experience in the survey and assessment of bird interests for Offshore Transmission Works infrastructure in the Firth of Forth, having completed assessments and associated HRAs for Inchcape Wind Farm and the Seagreen 1A Wind Farm. Particularly as a result of the latter, the team has been able to take into account the consultation discussions with NatureScot and Marine Scotland on survey and assessment matters. This is in addition to consideration of stakeholder responses in the Marine Scotland Scoping Opinion (March 2021) for the initial Berwick Bank proposal.

7. Initially, two potential landfall site options were being considered and were used to define the extent of the intertidal and nearshore survey areas. Results for both are reported here. However, for the Berwick Bank Offshore Wind Farm EIA, only the final selected landfall site will be considered (Skateraw).

KEY SPECIES

- 8. In formulating the approach to the baseline characterisation and the identification of key bird species, consideration was given to the habitats along the export cable corridor, the key species likely to be recorded, and the birds' associated conservation importance. This latter consideration included judgement on potential connectivity to designated sites and potential impact pathways, informed by professional judgement and the nature of the proposed export cable corridor works.
- 9. As a result, the intertidal and nearshore surveys were designed to assess the use of the intertidal and nearshore coastal habitats associated with the Offshore Export Cable landfall (the point where the Offshore Export Cables connect to the Onshore Export Cables). Surveys across this area recorded all species, with particular attention to relevant qualifying species of coastal SPAs/Ramsar Sites and Sites of Special Scientific Interest (SSSIs).
- The consideration of bird interests beyond the nearshore realm (from 1.5km off the Mean High Water Spring (MHWS) to the Berwick Bank Wind Farm Array site) focused on seabirds from the nearby SPAs/Ramsar Sites and SSSIs. Given the highly localised and temporary nature of export cable construction and maintenance, and the resulting very limited potential impact pathways, this approach is considered robust and suited to inform the EIA and HRA.
- 11. Figure 1 shows the boundary of the Berwick Bank Wind Farm, cable corridor and landfall, together with designated sites within 40km. Of these designated sites, the baseline characterisation has given particular consideration to the qualifying species of the following: Firth of Forth SPA/Ramsar Site; Forth Islands SPA; St Abbs Head to Fast Castle SPA; and The Outer Firth of Forth and St. Andrews Bay Complex SPA.
- 12. The following sections summarise information on these designated sites.

INTERNATIONAL DESIGNATED SITES ASSOCIATED WITH THE FIRTH OF FORTH

FIRTH OF FORTH SPA, RAMSAR SITE AND SSSI

- 13. The Export cable landfall is approximately 5.9km south-east of the Firth of Forth SPA, Ramsar site and SSSI as shown in Figure 1.
- 14. The Firth of Forth SPA consists of over 25 individual intertidal sites stretching from the inner reaches of the Forth Estuary near Alloa, Clackmannanshire (NS 863 914) in the west to Fife Ness, Fife (NO 639 096) and Dunbar, East Lothian (NS 677 729) at the outer reaches of the Firth of Forth in the east. This complex of sites contains a variety of coastal and estuarine habitats which attract large numbers and a wide variety of over-winter and passage wetland birds (waders and waterfowl) to the area.
- 15. This area is therefore designated under the EU Birds Directive (2009/147/EC), given its importance for protecting wild bird populations and their habitats. The site qualifies under Article 4.1 of the directive by supporting populations of European importance of species listed on Annex 1, and under Article 4.2 of the directive by regularly supporting winter populations of European and international importance of certain migratory species. The site also qualifies by supporting a winter waterfowl assemblage of European importance consisting of at least 95,000 individuals, including a further 17 species to those designated under Articles 4.1 and 4.2 alone. Further details of the Firth of Forth SPA, including its citation and conservation objectives can be found on NatureScot's SiteLink website1. Information on predicted effects from the non-export cable elements of the proposed Berwick Bank Wind Farm are given in Table 5.42 of the Berwick Bank HRA Screening Report (RPS 2020)².





- 16. The Firth of Forth is also listed as a Ramsar Site under the Conservation of Wetlands of International Importance especially as Waterfowl Habitat (an agreement signed in Ramsar, Iran 1971).
- 17. In addition, the Firth of Forth is a nationally important site designated as a Site of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). Notified in August 2000 for both biological and geological features, the SSSI has 46 qualifying interests including many bird species and habitats.
- 18. A full list of Ramsar Site and SSSI qualifying features can be found on NatureScot's SiteLink website 1.

ST ABBS HEAD TO FAST CASTLE SPA AND SSSI

- 19. The export cable landfall is approximately 6km south-east of the St Abbs Head to Fast Castle SPA (see Figure 1).
- 20. The St Abb's Head to Fast Castle SPA comprises an area of sea cliffs and coastal strip stretching over 10km along the Berwickshire Coast north of St Abbs. The boundary of the SPA overlaps with that of St Abb's Head to Fast Castle SSSI, and the seaward extension extends approximately 1km into the marine environment to include the seabed, water column and surface.
- 21. The SPA is designated for regularly supporting in excess of 20,000 individual seabirds. The site regularly supports 79,560 seabirds including nationally important populations of the following species: razorbill, common guillemot, black-legged kittiwake, herring gull and European shag (NatureScot 2009). Further details of the SPA, including its citation and conservation objectives can be found on NatureScot's SiteLink website1. Information on predicted effects from the non-export cable elements of the proposed Berwick Bank Wind Farm are given in Table 5.16 of the Berwick Bank HRA Screening Report (RPS 2020)².

FORTH ISLANDS SPA

- 22. The Forth Islands SPA consists of a series of islands supporting the main seabird breeding colonies in the Firth of Forth (Long Craig, Inchmickery, Isle of May, Fidra, The Lamb, Craigleith and Bass Rock) plus their seaward extensions to approximately 2km, around all but Long Craig. The export cable landfall is approximately 13.8km south-east from the nearest part of the SPA (the seaward extent of Bass Rock) (Figure 1).
- 23. These islands qualify by regularly supporting breeding populations of European importance of the Annex 1 species Arctic tern, common tern, Sandwich tern and roseate tern. Long Craig is designated for supporting the largest colony of roseate tern in Scotland and is the most northerly of only six regular British colonies of this species. The islands also qualify by regularly supporting breeding populations of European importance of the migratory species Northern gannet, European shag, lesser black-backed gull and Atlantic puffin.
- 24. The Forth Islands SPA is also designated for regularly supporting a breeding seabird as semblage in excess of 20,000 individuals. Named species of the assemblage (i.e. those occurring in nationally important populations) are the species listed above plus razorbill, common guillemot, black-legged kittiwake, herring gull, great cormorant and northern fulmar.

25. Further details of the SPA, including its citation and conservation objectives can be found on NatureScot's SiteLink website1. Information on predicted effects from the non-export elements of the proposed Berwick Bank Wind Farm are given in Table 5.19 of the Berwick Bank Screening Report (RPS 2020)².

OUTER FIRTH OF FORTH AND ST. ANDREWS BAY COMPLEX SPA

- 26. The Outer Firth of Forth and St Andrews Bay Complex SPA stretches from Arbroath to St. Abb's Head encompassing the Firth of Forth, the outer Firth of Tay and St. Andrews Bay and comprises an area of 2,720.68 km2. The site extends beyond the 12 nautical miles (nm) boundary of territorial and offshore waters to encompass key seabird feeding areas.
- 27. The Outer Firth of Forth and St Andrews Bay Complex SPA attracts one of the largest and most diverse concentrations of marine birds in Scotland. During the non-breeding season, it provides important wintering grounds used for feeding, moulting and roosting by a variety of divers, grebes and seaducks, including the largest aggregations of red-throated diver and common eider in Scotland. The Firth of Forth is also notable for its concentrations of wintering gulls, including little gull, kittiwake, black-headed gull, common gull and herring gull. Together with guillemot, shag and razorbill, these species contribute to an assemblage of over 40.000 seabirds using the site during the non-breeding season.
- 28. The site also encompasses feeding grounds for breeding common tern, Arctic tern and shag nesting colonies. During the breeding season, kittiwake, gannet, herring gull, guillemot, puffin, and Manx shearwater also contribute to the SPA assemblage of over 100,000 seabirds.
- 29. Table A.1 in Appendix 1 gives the populations for the Outer Firth of Forth and St Andrews Bay Complex SPA qualifying species.
- The nearshore boundary of the Outer Firth of Forth and St Andrews Bay Complex SPA follows the Mean Low Water Springs (MLWS) mark. The export cable corridor passes through the SPA therefore, and the cable landfall is immediately adjacent at the MLWS mark (see Figures 1 and 2).
- Further details of the SPA, including its citation and conservation objectives can be found on NatureScot's SiteLink website¹. Information on predicted effects from the non-export elements of the proposed Berwick Bank Wind Farm are given in Table 5.15 of the Berwick Bank Screening Report (RPS 2020)².

BARNS NESS COAST SSSI

- 32. This site is designated for both geological and biological features and contains a variety of coastal habitats including shingle and sandy shores, sand dunes and rocky stacks. The mineral enriched dune grassland, beach-head saltmarshes and shingle are of particular interest as examples of very uncommon habitats in the Lothian area. The grassland contains an exceptionally diverse range of wild flowers, including a number of locally rare plant species. A good diversity of birds is also noted but no details given as to the species present. Birds are not a designated feature of this SSSI.
- The northern-most spur of export cable corridor (which landfalls at Skateraw) passes through the SSSI and the cable landfall is immediately adjacent (see Figure 2).
- 34. Further details of the SSSI, including its citation and features can be found on NatureScot's SiteLink website¹.

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¹ SNH SiteLink website. Available at: (http://gateway.snh.gov.uk/sitelink/index.jsp).

² RPS (2020) Berwick Bank Habitat Regulations Appraisal: Stage 1 Screening Report, September 2020. https://marine.gov.scot/ml/berwick-bank-offshore-wind-farm





PEASE BAY COAST SSSI

- 35. Pease Bay Coast SSSI is located on the Berwickshire Coast, starting at the local authority boundary with East Lothian at Gutcher's Hole, near Dunglass Old Bridge, and continuing approximately 3km south along the coast to Red Rock at Pease Bay. This site is of geological and botanical interest only and birds are not a designated feature of this SSSI.
- 36. The southern-most spur of export cable corridor (which landfalls at Thorntonloch) passes approximately 300m north of the SSSI (see Figure 2).
- 37. Further details of the SSSI, including its citation and features can be found on NatureScot's SiteLink website¹.

1.2. INTERTIDAL AND NEARSHORE COASTAL BIRD SURVEYS

METHODOLOGY

- 38. The programme of monthly intertidal and nearshore coastal bird surveys was conducted over 12 months between July 2020 and June 2021 inclusive. This encompassed all key periods relating to bird interests and designated sites, specifically breeding and non-breeding seasons, plus spring and autumn passage.
- 39. The survey method was consistent with the method used by RPS for the Inch Cape and Seagreen 1A offshore wind farm developments, both of which have received consent.
- 40. The intertidal and nearshore coastal bird Survey Area comprised two separate landfall locations and their associated sections of export cable corridor (Figure 2). The length of shoreline surveyed covered approximately 6km to ensure contemporary data were collected for all potential export cable landfall locations under investigation.
- 41. Subsequently, further optioneering and analysis has been undertaken and the most southerly landfall site has been removed from the Proposed Development, and one landfall location at Skateraw remains. 1.2.5 Survey Area 1 covers the area from NT 72657 76463 to the western end of the Torness power station (NT 74332 75383). Given the extent of this Survey Area, it was segregated into two discrete count sectors (Sectors A and B), identified as follows:
 - Sector A: Starts around 500m south of Barns ness (NT 72657 76463) to Chapel Point (NT 73758 75817); and
 - Sector B: Covers from Chapel Point (NT 73758 75817) to Torness Power Station (NT 74332 75383).
- 42. Survey Area 2 covers the area from Thorntonloch (NT 75205 74459) to Gutcher's Hole (NT 77225 72473). Given the extent of this Survey Area, it was segregated into two discrete count sectors (Sectors C and D), identified as follows:
 - Sector C: Thorntonloch (NT 75205 74459) to the natural arches (NT 76001 76196); and
 - Sector D: The natural arches (NT 76001 76196) to Gutcher's Hole (NT 77225 72473).

- 43. Each survey sector extended out to 1.5km from the MHWS mark. To identify the distribution of birds, the count sectors were segregated into three distance bands: 0 500m, 500m 1km and 1km 1.5km (Figure 3).
- 44. Surveys of each sector were conducted by a surveyor at approximately monthly intervals between July 2020 and June 2021 inclusive. Survey times were scheduled to cover a range of different tidal conditions (high, low and mid-tide; spring and neap tides) throughout the survey programme.
- 45. Survey methods were based on the high tide (core count) methodology of the BTO/JNCC/RSPB/WWT WeBS scheme³. This involved the surveyor counting birds from vantage points along the coast using binoculars and a telescope. The birds present during each survey along the foreshore and nearshore coastal waters were counted and ascribed to one of the three distance bands. Observations of bird species (including the numbers of each species in a given location and behaviour) were plotted onto a field map using standard BTO species codes.
- 46. Field records were transferred to a Geographic Information System (GIS). This produced accurate information on the distribution of birds within the study area and enabled maps to be produced so that areas of ornithological importance could be identified.
- 47. Weather conditions including wind speed (using the Beaufort Scale), cloud cover (estimated as eighths or octas of the sky), visibility and temperature were also recorded as well as sources of disturbance to birds encountered during surveys. Details of the intertidal and nearshore coastal bird survey effort are presented in Table 1.

Table 1: Intertidal and Nearshore Coastal Bird Survey Effort and Tide Coverage

Month	Date	Survey Start Time (hr:min)	Survey End Time (hr:min)	Observer
July 2020	29/07/2020	10:21:00	14:47:00	CR
August 2020	30/08/2020	13:46:00	19:46:00	CR
September 2020	21/09/2020	11:52:00	18:12:00	CR
	24/09/2020	08:30:00	14:25:00	CR
October 2020	20/10/2020	11:29:00	17:45:00	CR
	22/10/2020	07:30:00	13:30:00	CR
November 2020	17/11/2020	09:25:00	15:50:00	CR
	25/11/2020	08:30:00	15:00:00	CR
December 2020	17/12/2020	10:00:00	16:00:00	CR
	19/12/2020	08:30:00	14:50:00	CR
January 2021	25/01/2021	09:15:00	15:30:00	CR

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³ Musgrove, A., Langston, R., Baker, H. and Ward, R. (2003). Estuarine Waterbirds at Low Tide: The WeBS Low Tide Counts 1992–93 to 1988–99. WSG/BTO/WWT/RSPB/JNCC, Thetford.





Month	Date	Survey Start Time (hr:min)	Survey End Time (hr:min)	Observer
	27/01/2021	09:30:00	15:40:00	CR
February 2021	17/02/2021	09:22:00	15:20:00	CR
	24/02/2021	09:30:00	16:00:00	CR
March 2021	09/03/2021	11:35:00	18:00:00	CR
	10/03/2021	06:30:00	12:35:00	CR
April 2021	01/04/2021	11:39:00	18:01:00	CR
	02/04/2021	06:30:00	12:35:00	CR
May 2021	01/05/2021	12:13:00	18:44:00	CR
	02/05/2021	07:00:00	13:15:00	CR
June 2021 CR	02/06/2021	09:50:00	15:30:00	CR
	03/06/2021	09:56:00	16:30:00	CR

CR = Chris Rodger

CONTEXTUAL BACKGROUND DATA

Wetland Birds Survey (WeBS) Data

- 48. WeBS count data were obtained from the BTO for the most recent high tide datasets gathered from the survey area which most closely corresponded to Survey Areas 1 and 2. These are the East Barns to Skateraw and the Skateraw to Dunglass count sectors. East Barns to Skateraw data were collected between 2015/2016-2019/20, however the most recent Skateraw to Dunglass data were collected in 2017/18, so the data used are between 2014/2015 2017/2018. These count sectors are shown in Figure 4
- 49. No low tide data were available.
- 50. WeBS counts are specifically aimed at recording the number of waterbirds which use particular wetland and coastal habitats. Core (high tide) counts are undertaken annually and conducted around high water on all estuaries and key wetland sites in the UK, generally on a set day each month. At this time, waterbirds tend to gather at high tide roosts and counts undertaken around high water provide an estimate of the total population of birds using an area of coast.
- Although extremely valuable in providing historical and contextual wetland bird data for particular sites of interest, WeBS data are sometimes limited by the fact that figures cover comparatively large areas and are therefore not necessarily representative of small scale patterns of bird abundance and distribution. Furthermore, it is extremely unlikely that the defined WeBS count sectors will match the areas being covered in targeted, project-specific surveys. As it is however, the two Count Sectors used correspond relatively closely with the intertidal and nearshore bird Survey Areas as shown in Figure 4 (though the Count Sectors do stretch further in each direction along the coast and the Survey Area stretches further out from the shore). Consequently, the WeBS data were used to supplement the more site specific data

gathered during the intertidal and nearshore bird surveys, and to compare the representativeness of project-specific survey results, as presented in Section 1.4.

1.3. RESULTS

- 52. For the purpose of clarity, reference to the breeding, non-breeding, post-breeding and passage seasons in the following text relate to the following periods:
 - Breeding season: mid-March to August inclusive (surveys began in July);
 - Non-breeding season: September to mid-March inclusive;
 - Post-breeding season: mid-July to September inclusive;
 - Autumn passage: September to November inclusive; and
 - Spring passage: March to mid-May inclusive

INTERTIDAL AND NEARSHORE BIRD SURVEY RESULTS

- The following presents the intertidal and nearshore bird survey results, which are shown in Figures 5.1 5.57. The figures show the distribution of sightings in the Survey Area. The total number of sightings are presented on each species map whilst monthly abundance and peak counts are presented in the species account below.
- Data tables and summarised accounts of each species are given under the following species group headings: waterfowl, wading birds, divers and grebes, gulls and terns and other seabirds. The data tables show the counts for each species in each month in each survey sector as well as the peak count over the course of the entire survey period. Some incidental records have been included that were considered to be important in the onshore area south of Sector B.

NEARSHORE AND INTERTIDAL HABITATS

55. The Survey Area comprised a combination of intertidal and shallow nearshore coastal habitats stretching across Survey Areas 1 and 2. The extent of shoreline exposed through the tidal cycle along most of this stretch of coastline was limited to less than 50 m, and at low tide, strips of pebble and boulder beach interspersed with rocky outcrops and sand became exposed, particularly in sectors A, B and D.

INTERTIDAL AND NEARSHORE BIRD DATA

56. A total of 54 species were recorded within the intertidal and nearshore Survey Area during the survey programme. The following survey results for each species should be read in conjunction with Table 2 to Table 6.

Waterfowl

57. Eider was the most abundant and regularly present waterfowl species throughout Survey Areas 1 and 2. Birds were recorded on every month of the survey programme with numbers typically ranging between one to 30 individuals. Occasionally, counts of over 30 individuals were recorded with the highest counts in each sector ranging from 69 in Sector A (February 2021), to 17 in Sector D (February 2021). All birds were recorded within 1km of the shore.

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- 58. Common scoters were recorded infrequently across all sectors, with typically counts of fewer than 30 individuals. Peak counts of 40 (August 2020) in Sector A, seven in Sector B (August 2020), 47 in Sector C (May 2021) and 20 in Sector D (October 2020) were recorded with all records between 500m and 1km from shore.
- 59. Red-breasted mergansers were recorded intermittently, predominantly during the winter and passage months in relatively low numbers of no more than five (September 2020 and March 2021 in Sector A, and March 2021 in Sector B), in all survey sectors. Almost all birds were recorded within 500m of the shore.
- 60. Mallard were recorded intermittently, with larger counts during the winter months. Counts were of predominately low numbers of no more than 16, however peak counts of 40 in Sector A (November 2020) and 37 in Sector B (February 2021) were recorded. All birds were recorded within 500m of the shore.
- 61. Wigeon were recorded infrequently across all sectors, with typically small counts of fewer than 30 individuals. However higher numbers were recorded in Sector D over the winter months with a peak count of 56 in February 2021. The species was recorded within 1km from shore
- 62. Goldeneye were recorded intermittently, predominantly during the winter and passage months in relatively low numbers of no more than seven in all survey sectors. The peak count of seven was recorded in Sector A (February 2021). Almost all birds were recorded within 500m of the shore.
- 63. Shelduck were recorded infrequently across all survey sectors in small numbers of no more than ten, however peak counts of 16 in Sector A (June 2021) and 15 in Sector B (June 2021) were recorded. Almost all birds were recorded within 500m of the shore.
- 64. Teal, goosander and long-tailed duck were recorded infrequently, with counts of eight individuals or less.
- 65. Pink footed goose, Canada goose, whooper swan and greylag goose were also recorded infrequently. Consequently, the data suggest that the Survey Area is of negligible importance for these species.

Table 2: Peak Monthly Counts and Overall Peak Counts of Waterfowl Recorded within Each Survey Sector over the Survey Programme

Species	Sector	Jul' 20	Aug' 20	Sep' 20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
Canada goose	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
goose	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	71	71
Common	Α	-	40	36	-	-	5	-	-	-	-	-	-	40
scoter	В	-	7	-	1	-	-	-	-	-	-	-	-	7
	С	-	8	-	3	8	-	-	-	-	-	47	-	47

Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec'20	Jan' 21	Feb'21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
	D	-	-	3	20	5	-	-	-	-	-	1	-	20
Eider	Α	15	3	2	1	6	12	12	69	44	11	8	6	69
	В	6	3	5	3	4	5	5	11	20	19	2	2	20
	С	-	1	10	7	3	16	14	14	23	11	5	-	23
	D	-	2	-	-	2	1	9	17	8	2	1	5	17
Goosander	А	-	-	5	-	-	-	-	-	-	-	-	-	5
	В	7	1	4	-	-	-	-	-	-	-	-	-	7
	С	-	-	-	-	-	-	-	-	1	-	-	-	1
	D	-	-	1	-	-	-	-	-	-	-	-	-	1
Greylag goose	А	-	-	-	-	-	-	1	51	-	-	-	-	51
3	В	-	-	1	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	1	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Goldeneye	Α	-	-	-	-	2	4	4	7	3	-	-	-	7
	В	-	-	-	-	1	1	1	2	1	2	-	-	2
	С	-	-	-	-	-	-	-	2	-	-	-	-	2
	D	-	-	-	-	-	-	1	2	3	-	-	-	3
Long-tailed duck	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	1	-	-	1	1	-	-	-	1
	D	-	-	-	-	-	-	-	3	-	-	-	-	-
Mallard	А	5	-	-	1	40	5	15	4	1	-	-	2	40
	В	3	-	-	-	7	33	37	4	2	2	-	-	37
	С	-	-	-	-	-	-	16	10	10	2	2	-	16

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Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
	D	-	-	-	-	1	6	4	4	1	3	2	2	6
Pink-footed goose	Α	-	-	-	-	5	5	38	220	-	-	9	-	220
goose	В	-	-	-	-	68	62	-	-	-	-	-	-	68
	С	-	-	-	-	17	-	-	-	-	-	-	-	17
	D	-	-	-	-	-	-	-	-	-	-	-	-	
Red-breasted	Α	-	-	5	-	2	2	3	3	5	2	4	-	5
merganser	В	-	-	-	1	4	2	2	3	5	-	-	-	5
	С	-	-	-	3	4	2	2	3	-	4	-	-	4
	D	-	-	-	-	1	4	1	2	3	3	-	-	4
Teal	Α	-	-	-	2	-	-	-	-	-	-	2	5	5
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	8	-	-	-	-	-	-	-	-	-	-	8
	D	-	-	-	-	-	-	3	-	-	-	-	-	3
Wigeon	Α	-	-	-	23	-	-	3	10	13	-	-	-	23
	В	-	-	-	-	-	-	-	17	5	3	-	-	17
	С	-	12	-	9	-	-	3	5	12	-	-	-	12
	D	-	-	4	-	12	56	40	56	48	7	-	-	56
Whooper	Α	-	-	7	-	-	-	-	-	-	-	-	-	7
swan	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Shelduck	А	-	-	-	-	-	2	-	2	3	6	8	16	16
	В	-	-	-	-	2	-	-	4	4	4	6	15	15
	С	-	-	-	-	-	-	-	3	2	-	1	-	3

Species	Sector	Jul' 20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
	D	-	-	-	-	-	-	-	2	1	3	2	-	3

Wading Birds

- 66. None of the wading birds recorded in the Survey Area exceeded the 1% threshold of national importance. Of the waders recorded in the Survey Area, purple sandpiper had the highest proportion of the Great Britain population with 0.31% (Peak count of 31 birds recorded in Sector B).
- Oystercatcher was the most abundant and regularly present species throughout the Survey Area with birds recorded on almost every month of the survey programme and in all four survey sectors. Numbers typically ranged between approximately 10 and 60 individuals. The peak count was 87 individuals (September 2020 Sector D). Given the consistent occurrence of the species throughout the year in all survey sectors, the data indicate that the Survey Area is of notable importance to this species.
- Turnstones were regularly present in all sectors throughout the passage and winter months. Numbers were variable, but moderate counts of over 20 individuals were occasionally recorded in Sectors A and D. By comparison, Sectors B and C supported no more than 13 birds. Given the regular occurrence of the species during passage and winter months, the data indicate that the Survey Area is of local importance to this species.
- 69. Curlew occurred regularly throughout the Survey Area in all sectors in moderate numbers. Birds were also recorded inland on adjacent fields, notably to the north-west of Skateraw Harbour. Given the abundance of the species, the data indicate that the Survey Area is of local importance to curlew.
- Dunlin also occurred throughout the Survey Area but were rarely recorded in Sector D. Numbers recorded in Sector B and C were moderate with peak counts of 23 in Sector B (February 2021) and 28 in Sector C (January 2021). Higher counts were occasionally recorded in Sector A with counts of 271 in December and 89 in March 2021.
- 71. Redshank occurred throughout the Survey Area but as with curlew, were rarely recorded in Sector C. Moderate counts were recorded in the other sectors with a peak count of 52 in Sector B (April 2021).
- 72. Ringed plover were recorded in every month in Sector C in moderate numbers (peak count 62 in October 2020). In Sectors A, C and D however they were only recorded occasionally in low numbers.
- 73. Greenshank, purple sandpiper, bar-tailed godwit, grey plover, knot, lapwing and golden plover were also recorded in the Survey Area. However, these species were recorded infrequently, albeit occasional larger numbers were recorded of purple sandpiper (31 Sector A February 2021), grey plover (23 Sector A, December 2020), knot (117 Sector A, March 2021, and golden plover (350 and 180 Sector November 2020 and January 2021). The SNCB interim guidance (SNCBs, 2017) defines displacement as affecting both birds on the water *and* in flight, therefore, the mean seasonal peaks were calculated from monthly population estimates for all birds present within the assessment boundaries. The monthly population estimates for each species in the Development Array (apportioned for unidentified birds), from which the mean-peaks have been calculated, can be found in Annex A. The monthly apportioned population

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estimates for each species in the Development Array plus 2 km buffer, from which the mean-peaks have been calculated, can be found in Annex B.

Table 3: Monthly Counts and Overall Peak Counts of Wading Birds Recorded within Each Survey Sector over the Survey Programme.

Species	Sector	Jul' 20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr. 21	May' 21	Jun' 21	Peak
Bar-tailed godwit	Α	-	-	5	7	2	4	-	2	-	11	-	-	11
godwii	В	-	-	12	-	-	-	1	-	-	-	-	-	12
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Curlew	Α	-	1	60	46	10	48	18	7	12	4	1	12	60
	В	18	-	12	21	3	35	23	19	1	6	-	-	35
	С	-	6	4	1	2	1	2	2	3	11	-	-	11
	D	7	-	3	2	1	1	49	22	36	3	2	1	49
Dunlin	Α	-	4	-	5	1	271	1	79	89	8	-	8	271
	В	-	-	-	-	17	2	5	23	21	-	1	-	23
	С	-	2	23	2	9	1	28	5	-	-	-	-	28
	D	-	-	-	-	-	1	-	-	-	-	-	-	1
Greenshank	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	1	-	-	-	-	1	-	-	-		1
Golden	А	-	-	-	-	-	-	-	-	-	-	-	-	-
plover	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	350	-	180	-	-	-	-	-	350

Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec'20	Jan'21	Feb' 21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
Grey Plover	Α	-	-	-	6	2	23	19	10	11	-	-	-	23
	В	-	-	-	1	-	-	4	3	10	-	-	-	10
	С	-	-	1	-	-	-	-	-	-	-	-	-	1
	D	-	-	3	-	-	2	-	-	-	-	-	-	3
Knot	Α	-	1	-	3	-	-	-	-	117	39	-	-	117
	В	-	2	-	1	-	-	-	-	3	-	-	-	3
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Lapwing	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	4	-	-	-	-	-	-	4
Oyster-	Α	-	-	19	16	24	30	58	16	28	10	10	8	58
catcher	В	16	44	66	69	43	57	64	24	35	47	30	8	69
	С	6	18	9	27	65	31	29	38	34	14	8	6	65
	D	26	8	87	15	54	49	33	39	48	58	43	43	87
Purple	Α	-	-	-	3	2	1	-	3	-	-		-	3
sandpiper	В	-	-	-	-	-	5	-	31	3	9	-	-	31
	С	-	-	-	-	-	-	6	-	-	-	-	-	6
	D	-	-	-	-	5	15	16	12	2	-	-	-	16
Redshank	А	-	1	6	10	37	9	8	4	1	3	-	-	37
	В	4	26	34	50	23	26	22	28	31	52	-	-	52
	С	-	-	-	-	3	-	5	-	1	1	-	-	5
	D	-	-	7	-	5	12	10	26	4	6	1	-	26

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Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb'21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
Ringed plover	Α	-	3	-	-	-	-	-	3	4	6	4	25	25
_	В	-	-	-	-	-	-	-	-	1	1	-	1	1
_	С	11	8	15	62	50	41	42	25	4	12	1	1	62
	D	-	-	4	-	2	-	-	-	-	-	-	-	4
Sanderling	Α	-	7	-	-	-	-	-	-	-	-	-	30	30
_	В	-	-	-	-	-	-	-	-	-	-	-	-	
	С	-	-	-	-	-	12	12	17	-	-	-	-	17
	D	-	-	-	-	-	-	-	-	-	-	-	-	
Turnstone	Α	-	23	17	32	24	8	8	16	12	4	-	-	32
_	В	-	10	2	4	10	4	13	-	5	-	-	-	13
	С	-	-	-	-	10	-	-	5	-	-	1	-	10
	D	-	-	-	-	49	27	15	31	23	-	2	-	49
Whimbrel	Α	-	-	-	-	-	-	-	-	-	-	-	4	4
_	В	-	-	-	-	-	-	-	-	-	-	-	3	3
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	1	1

Divers and Grebes

- 74. Red-throated divers were recorded frequently throughout the Survey Area during the autumn passage and early winter months. Although numbers were low, with an overall peak count of just nine individuals (December 2020, Sector C), this species does not typically occur in large aggregations during the non-breeding season. Birds were generally recorded between 0-1km from the shore. Despite its low abundance, the frequent occurrence of the species suggests that the nearshore coastal waters of the Survey Area are of local importance to red-throated divers.
- 75. One Slavonian grebe was recorded in March 2021 in Sector A. However, a single individual constitutes more than 1 per cent of the designated population of the Firth of Forth and the Outer Firth of Forth and St Andrews Bay Complex SPAs (84 and 30 individuals respectively) and therefore the data suggest that the nearshore coastal waters of the Survey Area are of local importance for this species.

- 76. Red-necked grebe were recorded in the Survey Area. However, only one individual was recorded in Sector D in November 2020 and therefore the data suggest the nearshore coastal waters of the Survey Area are of local importance for this species.
- 77. Great northern divers were recorded occasionally in low numbers with a peak count of two in Sector D in December 2020. The majority of birds were recorded in the southern spur of the offshore export cable corridor.

Table 4: Monthly Counts and Overall Peak Counts of Divers and Grebes Recorded within Each Survey Sector over the Survey Programme

Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak
Great northern	Α	-	-	-	-	-	-	1	-	-	-	-	-	1
diver	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	1	1	1	-	-	1	-	1
	D					1		1	1	2	2	1	-	2
Red- throated	Α	-	1	1	6	1	5	-	4	2	6	4	1	6
diver	В	-	-	1	3	5	-	2	1	1	1	1	-	5
	С	-	-	5	4	6	9	4	7	2	3	-	-	9
	D	-	-	1	3	5	2	4	3	6	-	3	1	6
Red- necked	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
grebe	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-		-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	1	-	-	-	-	-	-	-	1
Slavonian grebe	Α	-	-	-	-	-	-	-	-	1	-	-	-	1
grebe	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-

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Gulls and Terns

- 78. Herring gulls were the most abundant and regularly present gull species recorded throughout the Survey Area, being present on every survey in all four survey sectors. Numbers were consistently higher in Sector D, with regular counts of over 100 birds and an overall peak of 719 individuals (March 2021). The overall peak of 719 individuals was below the 1% threshold of national importance, which is set at 7,300 birds for herring gulls. Counts of over 100 birds were recorded in all sectors with peaks of 533 in Sector A (April 2021), 113 in Sector B (April 2021) and 167 in Sector C (May 2021). Birds were recorded in all three distance bands from the shore, although most birds were recorded in the shallow nearshore waters between 0-500m. Given the consistent occurrence and general high abundance of the species throughout the year, the data indicate the Survey Area is locally important to this species.
- 79. Black-headed gulls were also regularly present throughout the year with a peak count of 265 in Sector C (October 2020). Birds were mostly recorded out to 1km from the shore, although were mainly recorded in the shallow nearshore waters between 0-500m. Given the regular occurrence of the species throughout the year, and high abundance, the data suggest the Survey Area is of local importance to this species.
- 80. Common gulls were also regularly recorded throughout the year. However, the species was generally present in low abundance, with fewer than 20 individuals except for Sector D where considerably larger counts were recorded with a peak of 565 (December 2020).
- 81. Great black-backed gulls were also recorded in the Survey Area throughout the year with numbers ranging from fewer than 10 individuals to a peak of 35 in Sector B (November 2020).
- 82. Lesser black-backed gulls were rarely recorded within the Survey Area. A peak number of five individuals were recorded in Sector D (July 2020 and March 2021). Consequently, the data indicate that the Survey Area is of low importance for this species.
- 83. Kittiwake were regularly present within the Survey Area during the breeding season in all sectors. Numbers greatly differed and ranged from one to the overall peak of 1,035 in Sector D (September 2020). Consequently, the data indicate the Survey Area is of local importance for this species.
- 84. Sandwich terns were regularly present throughout the Survey Area during the breeding and post-breeding seasons in all four survey sectors although the species was represented by fewer than 20 individuals. The majority were recorded within 500m from the shore, indicating shallow nearshore waters are of local importance for this species at this time of year.
- 85. Common terns were rarely recorded within the Survey Area, with two or fewer individuals present. Consequently, the data suggest the Survey Area is of negligible importance for this species.
- 86. Individual counts of both Mediterranean gull (September 2020 Sector C) and Iceland gull (February 2021– Sector C) were recorded in the Survey area, indicating the Survey Area is also of negligible importance for these species.

Table 5: Monthly Counts and Overall Peak Counts of Gulls and Terns Recorded withinEach Survey Sector over the Survey Programme.

Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr'21	May 21	Jun' 21	Peak
Black-headed gull	Α	7	16	24	52	63	8	53	9	6	-	-	-	63
guii	В	35	68	68	62	31	2	17	6	-	1	1	-	68
	С	6	54	29	265	74	1	22	-	2	7	12	-	265
	D	16	9	95	118	301	69	8	11	175	-	5	-	301
Common gull	Α	1	-	10	12	16	11	9	10	3	17	2	-	16
	В	-	1	2	30	4	-	3	4	3	12	3	1	30
	С	-	11	1	26	3	4	1	1	1	15	5	-	26
	D	-	2	3	128	188	565	22	38	335	66	5	-	565
Great black-	Α	7	16	10	23	29	5	5	10	5	21	1	5	29
backed gull	В	4	11	5	5	35	4	2	6	2	17	3	2	35
	С	5	5	6	10	13	1	8	2	3	3	6	3	13
	D	6	19	11	1	7	5	8	3	2	2	2	2	19
Herring gull	Α	19	12	411	119	137	83	278	120	62	533	191	34	411
	В	17	15	47	23	53	21	7	45	37	113	73	6	113
	С	24	128	54	67	128	13	43	23	54	50	167	4	167
	D	207	595	496	486	86	109	68	72	719	147	266	41	719
Kittiwake	Α	7	46	103	6	2	-	-	-	-	2	1	7	113
	В	1	83	606	6	-	-	-	-	-	-	1	-	606
	С	2	119	381	56	-	-	-	1	-	3	6	45	381
	D	6	88	1035	215	1	-	-	-	-	1	1	42	1035
Lesser black-	Α	-	-	-	2	-	-	-	-	-	-	-		2
backed gull	В	1	-	-	-	-	-	-	-	1	-	-	3	3
	С	-	1	1	-	-	-	-	-	-	-	-		1
	D	5	-	-	-	-	-	-	-	5	-	-	3	5
Iceland gull	Α	-	-	-	-	-	-	-	-	-	-	_	-	-
	В	-	-	-	-	-	-	-	-	-	-	-	-	-

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Species	Sector	Jul'20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak
	С	-	-	-	-	-	-	-	1	-	-	-	-	1
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Mediterranean	Α	-	-	-	-	-	-	-	-	-	-	-	-	-
gull	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	1	-	-	-	-	-	-	-	-	-	1
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Common tern	Α	-	2	1	-	-	-	-	-	-	-	-	-	2
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	1	2	2
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Sandwich tern	Α	3	5	-	-	-	-	-	-	-	-	2	3	5
	В	1	4	1	-	-	-	-	-	-	-	-	2	4
	С	1	4	-	-	-	-	-	-	-		6	2	6
	D	18	-	1	-	-	-	-	-	-	-	2	3	18

Other Seabirds

87. Cormorants were regularly present within the Survey Area throughout the year in low to moderate numbers. A peak count of 31 individuals was recorded in Sector B (January 2021) but most other counts were considerably lower. The majority of birds recorded were within the 0-500m distance band indicating that the shallow nearshore waters of the Survey Area are favoured by this species. Despite the species' reasonably low abundance, the regular occurrence of cormorants throughout the year suggests that the nearshore coastal waters of the Survey Area are of local importance for the species. Random resampling of the dataset using size of the Development Array area was used to explore the distribution of the data and whether there was evidence of it being used preferentially to other equivalently sized areas. The number of observations counted out of 863 samples of the dataset, showed that the proposed Development Array area had a higher count than 94% of the samples. However, this resampling does not account for proximity to colony or landmasses. Annex E details analysis of GPS tracks of gannet tracked from Bass rock in the Forth and Tay. It was found that of the 682 birds tracked, only 26.2% of those individuals entered the development area, and of those only 52.5% (94 birds) engaged in any foraging activities (see table 3.3). Figure 3.3 illustrates the locations of predicted foraging behaviour (as identified by hidden Markov modelling) and that due to the large home ranges (median 3,909 km2), most foraging activity occurs outside the development site.

- 88. Shags were present in the Survey Area throughout the year, although numbers were generally low. Typically, there were no more than 11 individuals recorded. A peak count of 21 was recorded in Sector C (April 2021) however the majority of other months had much lower counts. As with cormorants, the majority of shags were observed within 0-500m from the shore. In general, the data suggest the Survey Area is of local importance for shags.
- 89. Guillemots were regularly recorded within the Survey Area throughout the year. Typically, numbers were low at under 40 individuals, however occasional higher numbers were recorded with a peak count of 730 in Sector D (September 2021) suggesting the Survey Area is of greater importance for this species at this time of year.
- 90. Razorbills were also regularly recorded within the Survey Area throughout the year with numbers ranging from one to a peak count of 734 in Sector D (September 2020). With four sectors recording more than 100 birds, the data suggest that the Survey area is of local importance to the species, with peak numbers typically in September.
- Gannets were regularly present in the Survey Area throughout the year with large counts recorded on a regular basis. A peak of 978 birds was recorded in Sector D (September 2020). The majority of birds were observed in flight between 1km and 1.5km offshore, indicating the deeper waters were regularly used than shallower nearshore waters
- 92. Fulmar were recorded regularly in the breeding season in low numbers with a peak count of 19 in Sector C (January 2021) suggesting the Survey Area is of low importance for this species.
- 93. Low numbers of Manx shearwater, puffin, Artic skua, great skua and long-tailed skua were recorded on surveys, indicating the Survey Area is of low importance for these species.

Table 6: Monthly Counts and Overall Peak Counts of Seabirds Recorded within Each Survey Sector over the Survey Programme

Species	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar'21	Apr' 21	May' 21	Jun' 21	Peak
Cormorant	Α	1	2	11	6	6	9	5	7	7	4	2	2	11
	В	6	5	30	16	21	18	31	16	10	6	4	6	31
	С	7	10	6	2	9	3	8	3	-	7	5	3	10
	D	3	-	19	4	7	10	10	5	1	2	7	6	19
Fulmar	Α	-	7	-	-	-	-	-	-	-	1	2	3	7
	В	-	17	-	-	-	-	-	3	-	-	1	2	17
	С	1	14	-	1	-	12	19	-	6	2	5	1	19
	D	-	17	-	-	-	3	3	4	1	6	1	6	17
Gannet	Α	212	368	603	258	16	-	-	5	107	63	83	40	603
	В	57	290	477	179	20	-	-	4	1	58	110	96	477

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Species	Sector	Jul' 20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak
	С	145	225	626	806	5	2	1	15	74	82	114	105	806
	D	207	156	978	134	1	4	3	3	59	56	56	84	978
Guillemot	Α	1	2	311	21	11	4	1	1	-	-	-	53	311
	В	-	12	412	35	7	2	-	1	-	-	1	52	412
	С	-	171	24	9	3	1	2	3	-	18	13	83	171
	D	-	156	730	2	4	-	1	2	3	8	4	91	730
Razorbill	A	-	-	250	18	2	6	-	2	2	-	5	-	250
	В	-	2	116	29	4	3	1	1	1	-	-	2	116
	С	-	106	19	4	8	2	2	6	28	9	19	4	106
	D	-	127	734	-	1	3	3	1	5	7	3	6	734
Shag	А	1	2	8	6	2	2	3	3	4	5	1	5	8
	В	3	4	17	3	12	9	1	5	3	4	2	1	17
	С	4	9	4	8	4	4	4	4	5	21	1	-	21
	D	1	3	5	2	7	3	8	6	4	3	3	4	8
Manx shearwater	A	3	-	-	-	-	-	-	-	-	-	-	-	3
	В	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	19	-	-	-	-	-	-	-	-	-	-	19
	D	-	-	-	-	-	-	-	-	-	-	-	2	2
Puffin	Α	-	-	-	-	-	-	-	-	-	-	-	5	5
	B	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	1	4	4
Arctic skua	A	-	-	-	-	-	-	-	-	-	-	-	-	-
	В	-	3	-	-	-	-	-	-	-	-	-	-	3
	С	1	-	-	-	-	-	-	-	-	-	-	1	1
	D	-	-	-	-	-	-	-	-	-	-	-	-	-
Great skua	Α	-	-	2-	-	-	-	-	-	-	-	-	-	-

Species	Sector	Jul' 20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec'20	Jan' 21	Feb'21	Mar' 21	Apr' 21	May' 21	Jun' 21	Peak	
	В	-	4	-	-	-	-	-	-	-	-	-	-	-	
	С	-	1	-	1	-	-	-	-	-	-	-	-	-	
	D	-	-	3	-	-	-	-	-	-	-	-	-	-	•

1.4. COMPARISON OF SURVEY AND WEBS DATA

- 94. The high tide WeBS data, which cover the period 2014 2018 (Skateraw to Dunglass corresponds to Sectors A and B) and 2015 2020 (East Barns to Skateraw corresponds to Sectors B and C), included the following information:
 - Five-year average monthly counts for each species;
 - Five-year peak monthly counts for each species;
 - Five-year peak counts for both autumn and winter and the month in which they were recorded in; and
 - Details of the international and national importance of the sectors for each species.
- 95. No low tide count data were available for the area.
- WeBS count data were obtained from the BTO for the most recent high tide datasets gathered from the survey area which most closely corresponded to Survey Areas 1 and 2. These are the East Barns to Skateraw and the Skateraw to Dunglass count sectors. East Barns to Skateraw data were collected between 2015/2016-2019/20 however the most recent Skateraw to Dunglass data collected was in 2017/18 so data used is between 2014/2015 2017/2018.
- Table 7 to Table 15 present the monthly and overall five year mean peak counts from the relevant count sectors. It is important to note that these count sectors extend further than the intertidal and nearshore survey count sectors (see Figure 4) and therefore are likely to include a higher number of species and records. These should be read in comparison with Table 2 to Table 6 in Section
- The WeBS data lists 24 species for the East Barns to Skateraw count sector and 26 species for Skateraw to Dunglass. This is lower than the number recorded during the 2020 2021 bird surveys. However, the additional species are all represented in very low numbers in the survey data, suggesting that the Survey Area is of negligible importance for them. It also reflects in some instances, the slightly larger offshore extent of the Survey Area.
- 99. Counts within the Skateraw to Dunglass sector were also only conducted between November and January inclusive.

Waterfowl

00. Larger peak counts of wigeon (146 - December), common scoter (70 - September) and mallard (47 - December) were recorded in the WeBS sectors. This corresponds with the survey data (wigeon - 84, March 2021, common scoter - 47, June 2021 and mallard - 48 November 2020).

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- 101. As with the intertidal and nearshore bird survey data, eider were recorded regularly but in relatively small numbers with a peak of 25 in January.
- 102. Shelduck were recorded regularly in small numbers within the breeding season which also corresponds with the survey data collected over 2020 2021.
- 103. Goldeneye, goosander, red-breasted merganser and teal also occurred within the WeBS sector, although all were recorded rarely and/or in very small numbers. This corresponds with the intertidal and nearshore survey data which showed low numbers of goldeneye and red-breasted merganser and occasional records of goosander and teal.

Table 7: Monthly Five-year Peak Mean Counts of Waterfowl Recorded within the WeBS High Tide Count Sector – East Barns to Skateraw

Species	la C	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Wigeon	0	0	0	0	0	7	6	0	20	0	0	0	20
Eider	0	21	14	1	1	1	3	0	16	4	10	12	21
Goldeneye	0	0	0	0	0	1	2	2	0	0	0	0	2
Goosander	0	10	0	2	0	0	0	0	0	0	0	13	13
Mallard	5	1	27	7	6	47	26	14	7	0	0	15	47
Red-breasted Merganser	0	0	0	0	0	2	0	0	0	0	0	0	2
Shelduck	0	5	0	0	0	0	0	2	2	1	9	14	14

Table 8: Monthly Five-year Peak Mean Counts of Waterfowl Recorded within the WeBS High Tide Count Sector – Skateraw to Dunglass (N/C = no count)

Species	Juc	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Wigeon	N/C	N/C	N/C	N/C	0	146	106	N/C	N/C	N/C	N/C	N/C	146
Eider	N/C	N/C	N/C	N/C	11	4	25	N/C	N/C	N/C	N/C	N/C	25

Goldeneye	N/C	N/C	N/C	N/C	0	0	2	N/C	N/C	N/C	N/C	N/C	2
Mallard	N/C	N/C	N/C	N/C	11	10	9	N/C	N/C	N/C	N/C	N/C	11
Red-breasted merganser	N/C	N/C	N/C	N/C	0	1	0	N/C	N/C	N/C	N/C	N/C	1
Teal	N/C	N/C	N/C	N/C	0	7	0	N/C	N/C	N/C	N/C	N/C	7
Common scoter	N/C	N/C	N/C	N/C	19	70	40	N/C	N/C	N/C	N/C	N/C	70

Wading Birds

- 104. Oystercatcher was the most abundant and consistently present wading bird species within the WeBS sectors, as was found during the intertidal and nearshore bird surveys. Monthly mean peak counts typically range between approximately 17 and 138 individuals. This corresponds very closely with the combined sector counts for the intertidal and nearshore bird Survey Area as a whole and supports the conclusion that the coastal habitats of the Survey Area are of low to moderate importance for this species. Indeed, the peak count of 138 individuals was well below the 1% threshold of national importance, which is 2,900 individuals.
- 105. Turnstones also occur within the WeBS sectors throughout most of the year with monthly mean peak counts ranging between lows of fewer than 10 individuals to the highest counts of between 50 and the peak of 95 birds. This also corresponds very well with the combined counts for intertidal and nearshore bird Survey Area as a whole and supports the conclusion that the coastal habitats of the Survey Area are of low to moderate importance for turnstone. The WeBS five-year peak mean count of 95 birds represented only 0.23% of the Great Britain population. The 1% threshold of national importance is set at 400 individuals.
- 106. Curlew, ringed plover, dunlin and redshank all occur within the WeBS sectors for much of the year, particularly the non-breeding season, but in relatively high numbers with peak counts of 58, 83, 114 and 138 birds respectively. This corresponds reasonably well with the combined counts for the intertidal and nearshore bird Survey Area as a whole and supports the conclusion that the Survey Area is of low to moderate importance for these species. All four species had five-year peak mean counts well below the 1% threshold of national importance.
- 107. Grey plover, purple sandpiper, sanderling and bar-tailed godwit regularly occur within the WeBS sectors. However, numbers are generally low with peak counts of 28, 6, 19 and 12 birds respectively. This corresponds reasonably well with the combined counts for the intertidal and nearshore bird Survey Area as a whole and supports the conclusion that the Survey Area is of low importance for these species. The WeBS five-year peak mean counts for grey plover, purple sandpiper, sanderling and bar-tailed godwit were below the 1% threshold of national importance.
- 108. Knot and golden plover were recorded occasionally and in small numbers in the WeBS sectors. Although the number of counts corresponds well with the survey data, occasional larger counts were recorded during the 2020-2021 surveys. The WeBS five-year peak mean counts for knot and golden plover were below the 1% threshold of national importance.
- 109. Whimbrel, snipe and woodcock were recorded rarely in small numbers on WeBS counts. This corresponds well with the intertidal and nearshore survey data.

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Table 9: Monthly Five-year Peak Mean Counts of Wading Birds Recorded within the WeBS High Tide Count Sector - East Barns to Skateraw

Species	luC	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Peak
Bar-tailed godwit	0	0	2	12	2	6	0	0	0	0	0	0	12
Curlew	9	13	18	34	10	24	18	8	58	0	6	12	58
Dunlin	0	114	68	38	47	80	87	22	35	0	4	24	114
Golden plover	0	0	0	0	0	0	1	0	6	0	0	0	6
Grey plover	0	0	0	4	0	2	28	3	6	0	0	0	28
Knot	0	0	0	0	0	0	0	0	0	0	0	4	4
Oystercatcher	36	78	70	113	102	135	138	93	70	17	60	62	138
Purple sandpiper	0	0	0	0	6	5	5	0	2	0	0	0	6
Redshank	12	8	67	49	127	138	55	95	77	4	1	0	138
Ringed plover	5	123	55	0	0	0	0	0	4	0	10	11	123
Sanderling	0	0	3	0	8	8	18	1	19	0	0	0	19
Snipe	0	0	1	0	0	0	0	0	0	0	0	0	1
Turnstone	2	17	40	60	95	53	50	26	38	0	11	0	95
Whimbrel	0	2	0	0	0	0	0	0	0	0	0	0	2

Table 10: Monthly Five-year Peak Mean Counts of Wading Birds Recorded within the WeBS High Tide Count Sector - Skateraw to Dunglass

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Peak
Curlew	N/C	N/C	N/C	N/C	14	12	6	N/C	N/C	N/C	N/C	N/C	14
Dunlin	N/C	N/C	N/C	N/C	1	3	0	N/C	N/C	N/C	N/C	N/C	3
Golden plover	N/C	N/C	N/C	N/C	0	7	29	N/C	N/C	N/C	N/C	N/C	29
Oystercatcher	N/C	N/C	N/C	N/C	107	68	57	N/C	N/C	N/C	N/C	N/C	107
Purple sandpiper	N/C	N/C	N/C	N/C	4	14	2	N/C	N/C	N/C	N/C	N/C	14
Redshank	N/C	N/C	N/C	N/C	14	19	14	N/C	N/C	N/C	N/C	N/C	19
Ringed plover	N/C	N/C	N/C	N/C	49	3	2	N/C	N/C	N/C	N/C	N/C	49
Sanderling	N/C	N/C	N/C	N/C	4	0	0	N/C	N/C	N/C	N/C	N/C	4
Turnstone	N/C	N/C	N/C	N/C	2	9	2	N/C	N/C	N/C	N/C	N/C	9
Woodcock	N/C	N/C	N/C	N/C	0	0	1	N/C	N/C	N/C	N/C	N/C	1

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Divers and Grebes

110. Red-throated divers were only recorded in November and January with no counts conducted between February and October and therefore no comparison was possible with the 2020 – 2021 survey data.

Table 11: Monthly Five-year Peak Mean Counts of Divers and Grebes Recorded within the WeBS High Tide Count Sector - Skateraw to Dunglass

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Red-throated diver	N/C	N/C	N/C	N/C	1	0	3	N/C	N/C	N/C	N/C	N/C	3

Gulls and Terns

111. With only one month of counts included in the WeBS data, no comparison was possible for gulls and terns with the 2020 – 2021 survey data.

Table 12: Monthly Five-year Peak Mean Counts of Gulls and Terns Recorded within the WeBS High Tide Count Sector - East Barns to Skateraw

Species	Jul	Aug	deS	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Sandwich tern	N/ C	N/C	2	N/C	2								

Table 13: Monthly Five-year Peak Mean Counts of Gulls and Terns Recorded within the WeBS High Tide Count Sector - Skateraw to Dunglass

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Peak
Black-headed gull	N/C	N/C	N/C	N/C	20	N/C	20						
Common gull	N/C	N/C	N/C	N/C	88	N/C	88						
Great black-backed gull	N/C	N/C	N/C	N/C	23	N/C	23						
Herring gull	N/C	N/C	N/C	N/C	282	N/C	282						
Lesser black-backed gull	N/C	N/C	N/C	N/C	6	N/C	6						





Other Seabirds

- 112. Cormorants occur within the WeBS sectors throughout the year with larger numbers recorded within the Skateraw to Dunglass Sector. Although these counts are much lower than numbers recorded within the 2020 2021 surveys, it is important to remember that the Survey Area covers a larger offshore area than the WeBS count sectors.
- 113. Shags were only counted between November and January so no full comparison can be made, however similar numbers were recorded during the 2020 2021 surveys.
- 114. There were no records of other seabirds in the WeBS data as these species are not assessed by WeBS.

Table 14: Monthly Five-year Peak Mean Counts of Seabirds Recorded within the WeBS High Tide Count Sector - East Barns to Skateraw

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Cormorant	0	0	6	3	0	0	0	1	1	0	2	2	6

Table 15: Monthly Five-year Peak Mean Counts of Seabirds Recorded within the WeBS High Tide Count Sector - Skateraw to Dunglass.

Species	Inc	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Peak
Cormorant	N/C	N/C	N/C	N/C	15	17	9	N/C	N/C	N/C	N/C	N/C	17
Shag	N/C	N/C	N/C	N/C	18	6	13	N/C	N/C	N/C	N/C	N/C	18

Overview

115. Overall, the WeBS data suggest that the coastal habitats of the Survey Area support a similar diversity and abundance of waterbird species to that recorded by the 2020-2021 intertidal and nearshore bird surveys. Therefore, the intertidal and nearshore bird survey data are considered to provide a comprehensive and robust baseline, identifying the diversity and abundance of the birds occurring within the Survey Area.

- 116. The characterisation of bird abundance and distribution for this section of the export cable corridor (beyond 1.5km of the shoreline) used a combination of:
 - Desk study of pre-existing published data, notably Waggit et al. (2019)⁴, Wakefield et al. (2017)⁵, Cleasby et al. (2020)⁶ and European Seabird at Sea (ESAS) data;
 - Datasets used in the designation of the Outer Firth of Forth and St. Andrews Bay Complex SPA provided by the Joint Nature Conservation Committee (JNCC) and NatureScot; and
 - Aerial survey data for the section falling within the 16km aerial survey buffer (see Figure 1), including 'hot and cold spot' mapping completed by RPS using a 14km buffer during the design process for Berwick Bank.
- 117. In addition, consideration was given to contextual data, notably bathymetry, fish spawning grounds and benthic habitats, as potential influences on bird distribution and abundance.
- 118. For ease of reference, available datasets were reviewed using the online web portal 'Osprey Online' that has been developed as part of RPS's input into the Berwick Bank project.
- 119. The results of the desk study review characterising bird interests of the export cable corridor are given in Table 16.

Table 16: Characterisation Export Cable Corridor Bird Interest for Qualifying Species of the Outer Firth of Forth and St. Andrews Bay Complex SPA

Species	Summary Description of Presence Along Export Cable Corridor (From Nearshore to the Proposed Berwick Bank Wind Farm)	Qualifying Season
Red-throated diver	Review of data from desk study and survey data sources showed that this species has no significant densities present along the majority of the export export cable corridor during any season. Higher densities of this species are recorded in nearshore areas in this SPA during the non-breeding season including further into the Firth of Forth in shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	Non-breeding
Slavonian grebe	As above	Non-breeding
Little gull	As above.	Non-breeding

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^{1.5.} CHARACTERISATION OF THE EXPORT CABLE CORRIDOR BEYOND THE NEARSHORE ENVIRONMENT TO THE BERWICK BANK WIND FARM

⁴ Waggitt, J. J., Evans, P. G. H., Andrade, J., Banks, A. N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C. J., Durinck, J., Felce, T., Fijn, R. C., Garcia-Baron, I., Garthe, S., Geelhoed, S. C. V., Gilles, A., Goodhall, M., Haelters, J., Hamilton, S. and Hiddink, J. G. (2020). Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), 253-269.

⁵ Wakefield, E., Owen, E., Baer, J., Carroll, M., Daunt, F., Dodd, S., Green, J., Guildford, T., Mavor, R., Miller, P., Newell, M., Newton, S., Robertson, G., Shoji, A., Soanes, L., Votier, S., Wanless, S. and Bolton, M. (2017) Breeding density, fine-scale tracking, and large-scale modelling reveal the regional distribution of four seabird species. Ecological Applications, 27(7), 2017, pp. 2074–2091

⁶ Cleasby, I., E., Owen, E., Wilson, L., Wakefield, E., O'Connell, P. and Bolton, M. (2020) identifying Important atsea areas for seabirds using species distribution models and hot spot mapping. Biological Conservation, 241 (2020), 108375.





Species	Summary Description of Presence Along Export Cable Corridor (From Nearshore to the Proposed Berwick Bank Wind Farm)	Qualifying Season
Common tern	Desk study and survey data sources reviewed show densities to be low along the export cable corridor during the breeding season.	Breeding
Arctic tern	Desk study and survey data sources reviewed show densities to be low along the export cable corridor during the breeding season . Higher densities of this species were recorded in nearshore areas in this SPA during the breeding season, including further into the Firth of Forth in shallower waters.	Breeding
	There are however no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	
Common eider	Review of data from desk study and survey data sources showed that this species has no significant densities present along the export cable corridor during the non-breeding season. Higher densities of this species were recorded in nearshore areas in this SPA during the non-breeding season, including further into the Firth of Forth in shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	Non-breeding
Long-tailed duck	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the export cable corridor during any season.	Non-breeding
Common scoter	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the cable corridor during the non-breeding season. Higher densities of this species are recorded in nearshore areas in this SPA during the non-breeding season, including further into the Firth of Forth in shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	Non-breeding
Velvet scoter	As above.	Non-breeding
Goldeneye	As above.	Non-breeding
Red-breasted merganser	As above.	Non-breeding
Northern gannet	The desk study and survey data sources reviewed indicate this species can occur in localised moderate densities in the breeding season, notably associated with foraging activity. These higher density areas are small scale, localised and temporary and could potentially occur at any point along the cable corridor. However, these short-lived localised aggregations do not represent significant sensitivities along the export cable corridor, given their temporary and transient nature. Furthermore, the distribution of sustained large scale higher density areas identified from the	Non-breeding

Species	Summary Description of Presence Along Export Cable Corridor (From Nearshore to the Proposed Berwick Bank Wind Farm)	Qualifying Season
	Berwick Bank aerial surveys do not coincide with the export cable corridor.	
Manx shearwater	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the cable corridor during any season. Higher densities of this species are recorded in nearshore areas in this SPA in the breeding season, including further into the Firth of Forth in shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	Breeding
European shag	As above.	Breeding
		Non-breedin
Black-legged kittiwake	The desk study and survey data sources reviewed indicate this species can occur in localised moderate densities in the breeding	Breeding
	season, notably associated with foraging activity. These higher density areas are small scale, localised and temporary and could potentially occur at any point along the cable corridor. However, these short-lived localised aggregations do not represent significant sensitivities along the export cable corridor, given the temporary and transient nature of the foraging aggregations. Furthermore, the distribution of sustained large scale higher density areas identified from the Berwick Bank aerial surveys do not coincide with the export cable corridor.	Non-breeding
Common guillemot	The desk study and survey data sources reviewed indicate this species can occur in moderate to high densities in the breeding	Breeding
	and post-breeding seasons, with the latter period resulting in peak densities. However, the distribution of sustained large scale higher density areas identified from the Berwick Bank aerial surveys do not coincide with the export cable corridor.	Non-breeding
Atlantic puffin	The desk study and survey data sources reviewed indicate this species can occur in moderate densities in the breeding season, associated with colonies on the Forth Islands. These higher density areas coincide with the south-west half of the offshore export cable corridor, and densities to the north-east decline towards the proposed Berwick Bank Wind Farm. There are however no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline during the breeding season. Outside the breeding season, densities are low along the whole export cable corridor.	Breeding
Black-headed gull	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the export cable corridor during any season. Higher densities of this species are recorded in nearshore areas in this SPA during the non-breeding season, including further into the Firth of Forth in	Non-breeding

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Species	Summary Description of Presence Along Export Cable Corridor (From Nearshore to the Proposed Berwick Bank Wind Farm)	Qualifying Season
	shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	
Common gull	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the export cable corridor during any season.	Non-breeding
Razorbill	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the export cable corridor during any season. The distribution of sustained large scale higher densities areas identified from the Berwick Bank aerial survey do not coincide with the export cable corridor.	Non-breeding
Herring gull	No indication from the desk study or survey data sources reviewed that this species has significant densities present along the export	Breeding
	cable corridor during any season. Higher densities of this species are recorded in nearshore areas in this SPA all year round, including further into the Firth of Forth in shallower waters but there are no sensitivities expected from this species from the export cable corridor beyond 1.5km from the shoreline.	Non-breeding

1.6. SUMMARY OF SURVEY RESULTS OF THE INTERTIDAL AND NEARSHORE HABITATS SPECIFICALLY IN RELATION TO OUTER FIRTH OF FORTH AND ST. ANDREWS BAY COMPLEX SPA

120. This section considers the importance of the intertidal and nearshore habitats of the Survey Area for qualifying bird species associated with the designated sites within the Firth of Forth (as introduced in Section 1.1). Only the Outer Firth of Forth and St. Andrews Bay Complex SPA overlaps with the export cable corridor. Indeed, the nearshore boundary of the Outer Firth of Forth and St Andrews Bay Complex SPA follows the Mean Low Water Springs (MLWS) mark. The export cable corridor therefore passes through the SPA, and the cable landfall is immediately adjacent at the MLWS mark. Other SPAs located within the Firth of Forth were outside the export cable corridor and thus not considered for determining the relative importance of the Survey Area in the context of the local SPAs. However, for true seabird species (e.g., gannet) which forage at some distances from their colonies in summer, we used the latest SPAs colony size (i.e., no. of pairs or individuals) from adjacent SPAS as a true reflection of the population size susceptible to use the export cable corridor. The survey data for the species of the Outer Firth of Forth and St. Andrews Bay Complex SPA are discussed with an associated table which presents the monthly counts and overall peak counts for each species in each survey sector (Table 17). This table also shows

what proportion the overall peak counts represent, compared with the various SPA species latest population estimates, as provided in Table A1, Appendix 1. These representative proportions allow the relative importance of each count sector for individual SPA qualifying species to be identified for each season. A critical threshold of 1% of species' qualifying populations was used to determine whether the particular sectors and/or the wider Survey Area were of regional importance for species designated in the Outer Firth of Forth and St. Andrews Bay Complex SPA. Sectors of greatest importance for SPA qualifying species, and intertidal and nearshore waterbirds in general, could then be identified, allowing a confident interpretation of the value of specific habitats within the study area.

Outer Firth of Forth and St. Andrews Bay Complex SPA

121. Table 17 shows the significance of the survey results for qualifying populations of the Outer Firth of Forth and St. Andrews Bay Complex SPA. For true seabird species such as gannet, guillemot, kittiwake and razorbill, the significance of the survey results was shown in the context of the latest breeding populations from adjacent SPAs. For example, the relative importance of each sector for gannet was calculated using the Forth Island SPA colony of Bass Rock (75,259 pairs in 2014). For guillemot, kittiwake and razorbill, the breeding population size is derived from the latest colony counts at the Forth Islands SPA, the Fowlsheugh SPA, and the St Abb's Head to Fast Castle SPA. For guillemot and kittiwake, we used non-breeding population size derived from Furness, 2015⁷; non-breeding population size included adult and immature birds from the Forth Islands SPA, the Fowlsheugh SPA, and the St Abb's Head to Fast Castle SPA, given that individuals from these SPAs are expected to be present in the North Sea during the non-breeding season.

Table 17: Importance of Intertidal and Nearshore Habitats for Qualifying Species of the Outer Firth of Forth and St. Andrews Bay Complex SPA

Species (& SPA Population)	Sector	Jul' 20	Aug' 20	Sep' 20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak	% SPA Population
Red	Α	-	1	1	6	1	5	-	4	2	6	4	1	6	0.71
throated diver (851)	В	-	-	1	3	5	-	2	1	1	1	1	-	5	0.59
	С	-	-	5	4	6	9	4	7	2	3	-	-	9	1.06
	D	-	-	1	3	5	2	4	3	6	-	3	1	6	0.71
Slavonian	Α	-	-	-	-	-	-	-	-	1	-	-	-	1	3.33
grebe (30)	В	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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⁷ Furness, R.W. 2015. Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.





Species (& SPA Population)	Sector	Jul' 20	Aug'20	Sep' 20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak	% SPA Population
Little gull (126)	/	-	-	-	-	-	-	-	-	-				-	-
Common	Α	-	2	1	-	-	-	-	-	-	-	-	-	2	0.11
tern (890 pairs)	В	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	1	2	2	0.11
	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arctic tern (540 pairs)	/	-	-	-	-	-	-	-	-	-				-	-
Eider	Α	15	3	2	1	6	12	12	69	44	11	8	6	69	0.32
(21,546)	В	6	3	5	3	4	5	5	11	20	19	2	2	20	0.09
	С	-	1	10	7	3	16	14	14	23	11	5	-	23	0.11
	D	-	2	-	-	2	1	9	17	8	2	1	5	17	0.08
Long-tailed duck	Α	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(1,948)	В	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	1	-	-	1	1	-	-	-	1	0.05
	D	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Common scoter	Α	-	40	36	-	-	5	-	-	-	-	-	-	40	0.86
(4,677)	В	-	7	-	1	-	-	-	-	-	-	-	-	7	0.15
	С	-	8	-	3	8	-	-	-	-	-	47	-	47	1.00
	D	-	-	3	20	5	-	-	-	-	-	1	-	20	0.43
Velvet scoter (775)	/	-	-	-	-	-	-	-	-		-	-		-	-
Goldeneye	Α	-	-	-	-	2	4	4	7	3	-	-	-	7	1.19
(589)	В	-	-	-	-	1	1	1	2	1	2	-	-	2	0.34
	С	-	-	-	-	-	-	-	2	-	-	-	-	2	0.34
	D	-	-	-	-	-	-	1	2	3	-	-	-	3	0.51
Red-	Α	-	-	5	-	2	2	3	3	5	2	4	-	5	1.16
breasted	В	-	-	-	1	4	2	2	3	5	-	-	-	5	1.16

Species (& SPA Population)	Sector	Jul' 20	Aug' 20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak	% SPA Population
merganser	С	-	-	-	3	4	2	2	3	-	4	-	-	4	0.93
(431)	D	-	-	-	-	1	4	1	2	3	3	-	-	4	0.93
¹ Gannet	Α	212	368	603	258	16	-	-	5	107	63	83	40	603	0.40
(10,945)	В	57	290	477	179	20	-	-	4	1	58	110	96	477	0.32
	С	145	225	626	806	5	2	1	15	74	82	114	105	806	0.41
	D	207	156	978	134	1	4	3	3	59	56	56	84	978	0.65
Manx	Α	3	-	-	-	-	-	-	-	-	-	-	-	3	0.34
shearwater (2,885)	В	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	19	-	-	-	-	-	-	-	-	-	-	19	2.15
	D	-	-	-	-	-	-	-	-	-	-	-	2	2	0.23
Shag (breeding	Α	1	2	8	6	2	2	3	3	4	5	1	5	8	0.21(b), 0.33(nb)
2,400, non- breeding 2,426)	В	3	4	17	3	12	9	1	5	3	4	2	1	17	0.17 (b), 0.70(nb)
	С	4	9	4	8	4	4	4	4	5	21	1	-	21	0.88(b), 0.33 (nb)
	D	1	3	5	2	7	3	8	6	4	3	3	4	8	0.17(b), 0.33 (nb)
² Kittiwake (breeding	Α	7	46	103	6	2	-	-	-	-	2	1	7	103	0.01(b), 0.34 (nb)
44,910,020, non- breeding	В	1	83	606	6	-	-	-	-	-	-	1	-	606	0.00(b), 2.01 (nb)
30,159)	С	2	119	381	56	-	-	-	1	-	3	6	45	381	0.10(b), 1.26 (nb)
	D	6	88	1035	215	1	-	-	-	-	1	1	42	1035	0.09(b), 3.43 (nb)
³ Guillemot (breeding	Α	1	2	311	21	11	4	1	1	-	-	-	53	311	0.19(b), 0.16 (nb)
28,123, non- breeding 21,968)	В	-	12	412	35	7	2	-	1	-	-	1	52	412	0.18(b), 0.22 (nb)
	С	-	171	24	9	3	1	2	3	-	18	13	83	171	0.61(b), 0.09 (nb)

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Species (& SPA Population)	Sector	Jul' 20	Aug'20	Sep'20	Oct' 20	Nov' 20	Dec' 20	Jan' 21	Feb' 21	Mar' 21	Apr' 21	May 21	Jun' 21	Peak	% SPA Population
	D	-	156	730	2	4	-	1	2	3	8	4	91	730	0.55(b), 0.39 (nb)
Puffin (61,086)	Α	-	-	-	-	-	-	-	-	-	-	-	5	5	0.02
	В	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	С	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-	-	1	4	4	0.01
Black- headed gull (26,835)	Α	7	16	24	52	63	8	53	9	6	-	-	-	63	0.10
	В	35	68	68	62	31	2	17	6	-	1	1	-	68	0.25
	С	6	54	29	265	74	1	22	-	2	7	12	-	265	0.99
	D	16	9	95	118	301	69	8	11	175	-	5	-	301	1.12
Common gull (14,650)	Α	1	-	10	12	16	11	9	10	3	17	2	-	16	0.06
	В	-	1	2	30	4	-	3	4	3	12	3	1	30	0.20
	С	-	11	1	26	3	4	1	1	1	15	5	-	26	0.18
	D	-	2	3	128	188	565	22	38	335	66	5	-	565	3.86
Herring gull (breeding 3,040, non- breeding 12, 310)	Α	19	12	411	119	137	83	278	120	62	533	191	34	411	17.53(b), 3.34 (nb)
	В	17	15	47	23	53	21	7	45	37	113	73	6	113	3.72(b), 0.43 (nb)
	С	24	128	54	67	128	13	43	23	54	50	167	4	167	5.49(b),1.04 (nb)
	D	207	595	496	486	86	109	68	72	719	147	266	41	719	23.65(b),4.06 (nb)
⁴ Razorbill (5,841)	Α	-	-	250	18	2	6	-	2	2	-	5	-	250	8.22
	В	-	2	116	29	4	3	1	1	1	-	-	2	116	1.99
	С	-	106	19	4	8	2	2	6	28	9	19	4	106	1.81
	D	-	127	734	-	1	3	3	1	5	7	3	6	734	12.57

¹ Gannet breeding population size derived from the latest breeding count at Forth Islands SPA (75,259 pairs in 2014)

1.7. SUMMARY AND CONCLUSIONS

- 122. The intertidal and nearshore bird survey data demonstrate that the Survey Area supports a diversity of bird species typical of coastal areas in the Firth of Forth, including waterfowl (predominantly seaducks), wading birds, divers, grebes and other seabirds.
- 123. The comparative WeBS data corresponded relatively closely with the intertidal and nearshore bird survey data. This demonstrated that the survey data were a robust representation of the diversity and abundance of the birds which typically occur within the Survey Area.
- 124. Of the qualifying species of SPAs, Ramsar and SSSIs associated with the Firth of Forth, the intertidal shore and nearshore waters of the Survey Area are typically of local importance for the majority of these birds. Higher numbers were recorded (i.e. approximately at or above 1% of the designated populations) however and Table 18 shows the species which had significant proportions of the Outer Firth of Forth and St. Andrews Bay Complex SPA populations present within the Survey Area. The table also presents the frequency in which they occurred in such numbers during the periods for which they are designated (i.e. regularly, occasionally or rarely).

Table 18: Summary List of SPA Qualifying Species Recorded in Significant Numbers (i.e. > than one per cent) Relative to the Outer Firth of Forth and St. Andrews Bay Complex SPA

Outer Firth of Forth and St. Andrews Bay Complex SPA

Occasionally:

Herring gull (breeding and non-breeding)

Kittiwake (non-breeding)

Rarely:

Common scoter

Goldeneye

Black-headed gull

Slavonian Grebe

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² Kittiwake breeding population size derived from the latest breeding counts at Forth Islands SPA (3,514 pairs), Fowlsheugh SPA (14,039 pairs), and St Abb's Head to Fast Castle SPA (4,902 pairs).

³ Guillemot breeding population size derived from the latest breeding counts at Forth Islands SPA (28,786 individuals), Fowlsheugh SPA (55,507 individuals), and St Abb's Head to Fast Castle (36,206 individuals).

⁴ Razorbill breeding population size derived from the latest breeding counts at Forth Islands SPA (9,144 individuals), Fowlsheugh SPA (13,872 individuals), and St Abb's Head to Fast Castle (4,428 individuals).





Red-breasted merganser

Notes: * Species associated with the:

Outer Firth of Forth and St. Andrews Bay Complex SPA is designated for its important populations during the breeding and non-breeding seasons (depending on the species).

'Regularly' is broadly taken to refer to species which were present in significant proportions of their associated SPA population on most of the surveys undertaken during the period for which the species is designated.

'Occasionally' is broadly taken to refer to species which were present in significant proportions of their associated SPA population on fewer than half of the surveys undertaken during the period for which the species is designated.

'Rarely' is broadly taken to refer to species which were present in significant proportions of their associated SPA population on just one or two of the surveys undertaken during the period for which the species is designated.

Of the qualifying species of the Outer Firth of Forth and St. Andrews Bay Complex, the only species occurring in any notable numbers in the section of the offshore export cable corridor from nearshore to the proposed Berwick Bank Wind Farm were seabirds, notably guillemot, puffin and kittiwake. These species were both prevalent in the breeding season, and the former in the post-breeding period as well. Even despite the relatively high densities at these times of the year, these are not considered significant constraints for the cable laying process, with the risk of disturbance being mitigated through adoption of a suitable Vessel Management Plan. Kittiwake were also present in significant numbers during the non-breeding season. However, the numbers of birds calculated as a proportion of the adjacent SPAs population might be over-estimated using this approach. Indeed, kittiwake from colonies located in the North-East Atlantic might also overwinter in the area.

Overall, the baseline data on which to base an assessment of the export cable's effects on birds is robust. Taking account of standard mitigation approaches such as deployment of an Ecological Clerk of Works and adoption of a suitable Vessel Management Plan, it is envisaged that predicted residual effects are unlikely to present an obstacle to consent.



ANNEX A QUALIFYING SPECIES ASSOCIATED WITH THE OUTER FIRTH OF FORTH AND ST. ANDREWS BAY COMPLEX SPA

Table A1: Qualifying Species of the Outer Firth of Forth and St. Andrews Bay Complex SPA.

Species	Qualifying Population*	Qualifying Season		
Red-throated diver	851	Non-breeding		
Slavonian grebe	30	Non-breeding		
Little gull	126	Non-breeding		
Common tern	890 pairs	Breeding		
Arctic tern	540 pairs	Breeding		
Common eider	21,546	Non-breeding		
Long-tailed duck	1,948	Non-breeding		
Common scoter	4,677	Non-breeding		
Velvet scoter	775	Non-breeding		
Goldeneye	589	Non-breeding		
Red-breasted merganser	431	Non-breeding		
Northern gannet	10,945	Non-breeding		
Manx shearwater	2,885	Breeding		
European shag	2,400	Breeding		
	2,426	Non-breeding		
Black-legged kittiwake	12,020	Breeding		
	3191	Non-breeding		
Common guillemot	28,123	Breeding		
	21,968	Non-breeding		
Atlantic puffin	61,086	Breeding		
Black-headed gull	26,835	Non-breeding		
Common gull	14,650	Non-breeding		
Razorbill	5,841	Non-breeding		

Species	Qualifying Population*	Qualifying Season		
Herring gull	3,040	Breeding		
	12,310	Non-breeding		

Note:

*SPA Qualifying Populations based on Outer Firth of Forth and St. Andrew's Bay Complex citation (2020)

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ANNEX B FIGURES





























































































































