Appendix 6.2: Terrestrial Ornithology Survey Report

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Muir Mhòr Offshore Wind Farm Limited

Muir Mhòr Offshore Wind Farm: Onshore Transmission Works

Appendix 6.2: Terrestrial Ornithology Survey Report

Draft report
Prepared by LUC
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Muir Mhòr Offshore Wind Farm Limited

Muir Mhòr Offshore Wind Farm: Onshore Transmission Works

Technical Appendix 6.2: Ornithology Survey Report

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Chapter 1
Introduction

1.1 This appendix details the results of ornithology surveys undertaken by LUC at the site of onshore works associated with the proposed Muir Mhòr Offshore Wind Farm, hereafter referred to as 'the Proposed Development'. The wind farm is planned to be approximately 60 km offshore to the east of Peterhead, Aberdeenshire, Scotland. The associated onshore works include the landfall zone at Lunderton Bay, 2 km north of Peterhead (adjacent to Peterhead Golf Course), a sub-station compound at Westerton of Barnyards 2.1 km north-west of Peterhead, and an underground cabling route extending from the landfall point to the site of the proposed SSEN Netherton Hub (400kV Substation), near Nether Kimundy, 2.5 km south-east of Longside, Aberdeenshire.

1.2 This appendix has been written to support **Chapter 6: Terrestrial Ornithology** of the Environmental Impact Assessment Report ('EIA Report') and should be read in conjunction with this chapter and **Chapter 5: Terrestrial Ecology** of the EIA Report.

Supporting Documents

1.3 This appendix supports the OIA in addition to the following appendices:

- **Appendix 6.1: Desk Study and Legal Context**

1.4 This appendix is supported by the following figures which can be found in **Volume 2** of the EIA report:

- **Figure 6.1: Ornithology Survey: 20km Study Area and Sites Designated for Ornithological Interest Area;**
- **Figure 6.2: Landfall Zone Intertidal Area Breeding and Wintering bird Activity;**
- **Figure 6.3: Non-breeding season Survey Results (Cable Corridor Zone and Substation Zone); and**
- **Figure 6.4: Breeding season Survey Results (Cable Corridor Zone and Substation Zone).**

Terminology and Survey Areas

1.5 The following terminology is used throughout this appendix:

- **Site**
  - The area defined by the red line application boundary within which all infrastructure associated with the onshore works will be located, as shown in **Figure 6.3 and 6.4**.
- **Proposed Development**
  - Comprises the onshore components of the Muir Mhòr Offshore Wind Farm that are landward of the Mean Low Water Springs (MLWS) mark.
- **Development Zones**
  - **'Landfall Zone':** The area above MLWS where the offshore export cables will be brought onshore.
  - **'Cable Corridor Zone A':** The area within which electrical cables (up to 275 kV) are proposed to be located, from the Landfall Zone to the Substation Zone.
  - **'Cable Corridor Zone B':** The area within which electrical cables (up to 400 kV) are proposed to be located, from the Substation Zone to their anticipated grid connection point at the SSEN Netherton Hub substation.
  - **'Substation Zone':** The area within which the Proposed Development substation is proposed to be located.
- **Breeding bird Survey Area**

- The area to 500 m of the red-line boundary in which breeding bird (and non-breeding bird) surveys were undertaken in line with good practice guidelines for all ornithological features surveyed. This comprised all land within the red-line boundary (as shown in **Volume 2**, **Figure 6.2-Figure 6-4**).

Chapter 2
Methods

Desk Study

2.1 A desk study was undertaken to inform the ornithological surveys and receptors. An account of the method adopted, and findings, is provided in **Appendix 6.1**, which also sets out the legislative provisions afforded to protected habitats.

Field Survey

Overview

2.2 Surveys were carried out between 20 October 2022 and 31 May 2024, representing 1 year and 8 months of ornithological data collection across the Proposed Development.

2.3 Surveys were undertaken to collect data on the baseline bird community at the site of the Proposed Development and within appropriate buffers surrounding the Site (**Volume 2**: **Figures 6.2, 6.3 and 6.4**) in the non-breeding and breeding seasons, and aimed to establish:

- the composition of breeding bird community;
- the occurrence and status of wintering birds; and
- The level of usage of the landfall point by waterbirds.

2.4 These were carried out with reference to the status of bird species designated as qualifying features of the SPAs with potential connectivity to the Proposed Development.

2.5 Surveys focussed on collecting information on the presence, abundance, distribution and flight activity of breeding and wintering birds of conservation concern. These are species listed on Annex 1 of the EU Bird Directive, species listed on Schedule 1 of the Wildlife and Countryside Act (1981) (WCA), and species on the Red List of Birds of Conservation Concern (BoCC) (Stanbury et al. 2021)[1].

Baseline Data Collection

Survey Periods

2.6 Inter-tidal surveys at proposed landfall point locations commenced on 20th October 2022 until 13th September 2023. Inter-tidal surveys continued at the preferred landfall point only (at Lunderton Bay, adjacent to Peterhead Golf Course) until 13th March 2024, forming an 18-month survey effort at the landfall point.

2.7 Wintering bird surveys of proposed sub-station locations commenced on 27th September 2023 and ceased on 13th March 2024.

2.8 Surveys of the cable corridor zones were undertaken in July 2023, and again in April and May 2024, inclusive of proposed sub-station sites.

[1] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.

Survey Areas

2.1 Some birds can range over wide areas as such surveys to characterise a site's baseline bird community extended to habitats at ecologically appropriate distances from the Proposed Development. These distances are species-specific and took account of the likely distances over which individuals may be affected by the presence of the Proposed Development.

2.2 The ornithology survey areas were defined by the site boundary of the Proposed Development, with some survey areas modified by early iterations of sub-station and cable corridor layout.

2.3 The final ornithology Study Areas differ at parts, compared to the original survey areas, and reflect buffers around the infrastructure of the Proposed Development, with buffer size dependant on the survey method, species or species group (**Volume 2: Figures 6.2, 6.3 and 6.4**).

2.4 The sub-station site was confirmed only after the winter surveys had been completed. As such, complete coverage of the substation site had not been carried out. However, habitat which was surveyed was continuous throughout the site (agricultural land with hedgerows) and usage by foraging geese is not thought to be different to that which was surveyed. The majority of the search area does lie within the 500 m buffer of the cable corridor zones.

2.5 Ornithology Study Areas were as follows:

- Landfall assessment area – 500 m buffer area from the high-water mark of the proposed cabling point at Lunderton Bay (including landfall zone);
- Cabling route assessment area – the proposed corridor of the underground cable corridor zones A and B with a 500 m buffer around the entire route; and
- Site of the proposed substation – inclusive of a 500 m buffer around the sub-station zone.

Survey personnel

2.6 Surveys were undertaken by Jonathan Daisley (JND), Darren Wilson (DW), Andrew Matthews (AM), Sean Kerr (SK), Michal Ostalowski (MO), and Victoria Curley (VC). All are experienced surveyors and had received appropriate training in the field survey methods being used.

Field Surveys

Inter-tidal surveys

2.7 Landfall points were initially proposed at eight potential locations in October 2022 which had been further reduced to three potential locations near Peterhead in April 2023: i) Sandford Bay; ii) Lunderton Bay; iii) and St. Fergus Links. All three sites were surveyed for a full year, being visited once per calendar month, with the exception of Lunderton Bay (as the preferred landfall point) which was surveyed for an additional six months.

2.8 The methods used were based upon the waterfowl on non-estuarine coastlines surveys as outlined in Gilbert et al[2]. The landfall point together with a 500 m disturbance buffer was walked by the surveyor with suitable vantage points being selected, where available. The area was scanned with binoculars (8x30 and above magnification) and/or 'a scope. A count total for each species was made across the site and associated buffer. The count total of resting, feeding and 'loafing' birds within the study area together with birds flushed away from study area was made (the surveyor would make suitable effort not to disturb any birds, however). Birds flying over from one point to another (e.g. commuting to a roosting/feeding site) were not placed in this total, however birds recorded flying as part of hunting were added to the total. Target bird species groups recorded include wildfowl (ducks, geese & swans); gulls & terns; divers and waders together with raptors and other notable species.

2.9 Where disturbance was noted, this was recorded as to whether 'natural' (i.e. due to the presence of a predator) or whether man-made, including dog-walking.

[2] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird monitoring methods. A manual of techniques for key UK species. RSPB, Sandy, Bedfordshire

2.10 Survey was carried out in suitable weather conditions, where visibility was, generally, not affected by fog or heavy rain and also not in the presence of high winds (i.e. greater than Beaufort force 5) **(Annex B).**

2.11 Survey timing was carried out in relation to tide times. Namely, counts were carried out targeting low and high tides at each landfall site. Where survey occurred closer to high tide than low tide, the count was described as a high tide count. High tide counts focussed more on roosting birds, low tide counts on birds foraging on the shoreline. An equal number of high and low tide surveys were carried out between October 2022 and September 2023. A maximum of 2 hours was spent at any landfall site, once per month (**Table 3.1**).

Table 3.1: Landfall point Survey effort

Survey Date	Surveyor	Time of survey		Tide
		Start	**End**	
20/10/2022	JND	11:55	13:45	High
23/11/2023	DW	12:00	13:10	High
14/12/2022	AM	11:05	13:05	Low
11/01/2023	SK	12:15	13:15	High
20/02/2023	AM	10:30	12:30	High
15/03/2023	DW	10:55	12:30	Low
13/04/2023	SK	12:10	13:45	Low
11/05/2023	DW	10:30	12:45	Low
13/06/2023	VC	15:45	17:30	Low
19/07/2023	DW	13:00	14:30	High
09/08/2023	AM	09:40	11:40	Low
13/09/2023	DW	12:45	14:30	High
11/10/2023	AM	13:45	15:45	Low
16/11/2023	SK	12:45	14:45	High
14/12/2023	VC	13:30	15:30	High
19/01/2024	DW	13:50	15:45	Low
07/02/2024	AM	13:50	15:50	Low
13/03/2024	DW	12:05	14:05	High

Wintering wildfowl surveys

2.12 Surveys targeting qualifying features of the Loch of Strathbeg SPA i.e. wildfowl such as pink-footed and barnacle geese (as well as other species including greylag goose and whooper swan) were conducted in the area of potential sub-station locations over the non-breeding season (September 2023 – March 2024).

2.13 Potential substations were surveyed up to 500 m from the defined development area and were walked over to assess how the area was being used by foraging wintering geese.

2.14 Two surveys were undertaken per month, usually within a day of each other, but at different times of the day to take into consideration variation in foraging activity of geese throughout the day.

2.15 All wildfowl species present within this area during the survey visits were recorded, as well as the presence of goose droppings indicative of recent foraging activity, where access was available.

2.16 A total of more than 45 hours of these targeted winter walkovers were undertaken between September 2023 and March 2024 (**Table 3.2**).

Table 3.2: Winter walkover survey effort

Date	Surveyor	Start	Finish	Duration
27/09/23	DW	13:00	16:25	3.33
28/09/23	DW	09:00	12:40	3.53
10/10/23	AM	13:40	17:40	4
11/10/23	AM	09:00	12:05	3.08
15/11/23	SK	13:25	15:30	1.92
16/11/23	SK	08:30	11:30	3
13/12/23	VC	12:00	15:30	3.5
14/12/23	VC	09:00	12:30	3.5
18/01/24	DW	13:05	16:05	3
19/01/24	DW	09:30	13:10	3.67
06/02/24	AM	12:50	16:40	3.83
07/02/24	AM	09:10	12:55	3.75
12/03/24	DW	13:30	16:20	2.84
13/03/24	DW	08:40	11:45	3.08

Cabling route surveys

2.17 Due to undergrounding of the planned cabling route (cable corridor zones A and B), flight activity surveys were deemed unnecessary as collision risk was not a factor. Surveys undertaken were proportional to the proposed works.

2.18 Surveys of the cabling route were concerned with breeding birds and SPA species within the area. All areas within the cabling route corridor were visited to assess how the area was used by breeding birds, in particular, herring gull (designated breeding species of Buchan Ness to Collieston Coast SPA).

2.19 All suitable, accessible open habitat and hedgerows were walked over and checked for presence of species of concern and activity of which was recorded.

2.20 All survey data was collected on GIS-enabled field tablets to increase accuracy and facilitate robust interpretation. The methods are outlined below.

2.21 Analysis of the recorded mapped data was undertaken together with maximum count data to produce final distribution maps of all birds throughout the BBS area. The following criteria were used to establish whether birds were breeding:

2.22 For all birds:

- Presence of nest, eggs and/or chicks;
- Alarm calling indicative of nest, young or territory;
- Displaying or in song-flight;
- Performing a distraction display;
- Birds aggressively defending territories; and
- Birds seen carrying food to nest or young.

2.23 For all raptors:

- If a pair was attached to a territory.

2.24 For all passerines:

- Birds singing or alarm calling.

2.25 All other behaviour was considered as being indicative of non-breeding activities.

2.26 A total of 23 hours and 10 minutes of walkover were undertaken during the breeding season (**Table 3.3**).

Table 3.3: Breeding season survey effort of cabling route

Date	Surveyor	Start	Finish	Duration
18/06/23	DW/JND	10:30	16:30	6:00
19/06/23	DW/JND	09:00	14:00	5:00
30/04/24	DW	14:00	17:01	3:02
01/05/24	DW	10:05	13:10	3:08
30/05/24	DW	13:20	16:20	3:00
31/05/24	DW	09:20	12:20	3:00

Chapter 3
Baseline Results

Desk Study

3.1 A desk study was undertaken to inform the ornithological. An account of the methods adopted, and findings, is provided in **Appendix 6.1** which also sets out the legislative provisions afforded to birds.

Field Study

Proposed Development

3.2 The Site is located to the north-west of Peterhead within the Aberdeenshire Council administrative area and covers an area of approximately 521 hectares (ha). The location of the Site is shown in **Figure 6.1**.

3.3 The onshore aspects of the Proposed Development will include a landfall location, onshore cable corridor (split into two zones, A and B) and onshore substation. The ongoing working assumption is that the connection to the grid will be made at a proposed new 400 kV substation being brought forward by SSEN, known as the SSEN Netherton Hub, located west of Peterhead.

Site Overview

3.4 For habitats associated with the Proposed Development refer Appendix 5.2 Habitat and Vegetation.

Landfall Zone

Intertidal Survey Results

3.5 A total of 31 species were recorded over the 18-month survey programme at Lunderton Bay (October 2022 - March 2024), nine of which were designated species of the surrounding SPAs (**Volume 2, Figure 6.2**).

3.6 Qualifying species with potential connectivity of the SPAs which were recorded at the proposed landfall zone are discussed below. A full list of species recorded, including maximum counts of each, by month can be found in **Annex A.**

3.7 Disturbance to birds was recorded at each of the proposed landfall points. At Lunderton Bay, the preferred landfall point, disturbance events were recorded on three of the 18 survey visits: a variety of species in November 2023 were flushed by dog walkers (including 11 redshank and 17 herring gull); 60 redshank flushed by a surveyor in February 2023, and 80 herring gull were flushed by a dog walker in March 2023.

Non-breeding Season

Eider

3.8 Eider (Amber-listed in BoCC) is a designated non-breeding species of the Ythan Estuary, Sands of Forvie, and Meikle Loch SPA.

3.9 At Lunderton Bay, Eider were recorded in December 2022, January, February, March, and November 2023, as well as in February 2024 as part of non-breeding season counts. The birds were recorded feeding and loafing in this area and were seen roosting on one occasion. Maximum count at high tide was 53 in January 2023, and 45 at low tide in December 2022. Eider were noted to have bred approximately 1 km south of the 500 m buffer at the landfall point here, at the rock platform at Craigewan. A female was sighted roosting here with 4 young ducklings in June 2023.

Goldeneye

3.10 Goldeneye (Red-listed in BoCC) are a designated non-breeding species of the Loch of Strathbeg SPA.

3.11 At Lunderton Bay, goldeneye were recorded in September and October 2024 as part of non-breeding season counts. The birds were feeding here on both occasions. Maximum count at low tide was 4 in September 2023, and 2 at high tide in October.

Pink-footed Goose

3.12 Pink-footed goose (Amber-listed in BoCC) are a designated non-breeding species of both the Loch of Strathbeg SPA, and the Ythan Estuary, Sands of Forvie, and Meikle Loch SPA.

3.13 This species was recorded as a single flock of 4 birds was recorded within the survey area at Lunderton Bay in February 2024.

Redshank

3.14 Redshank (Amber-listed in BoCC) are a designated non-breeding species of the Ythan Estuary, Sands of Forvie, and Meikle Loch SPA.

3.15 At Lunderton Bay, redshank were recorded in November and December 2022, and February and December 2023 as part of non-breeding season counts. The birds were usually recorded feeding but were also seen to be loafing on one occasion. Maximum count at high tide was 20 in December 2023, and 3 at low tide in December 2022.

Teal

3.16 Teal (Amber-listed in BoCC) are a designated non-breeding species of the Loch of Strathbeg SPA.

3.17 Teal were recorded at Lunderton Bay, on only one occasion, which was a record of 4 birds, at high tide, in September 2023.

Breeding Season

Guillemot

3.18 Guillemot (Amber-listed in BoCC) are a designated breeding species of the Buchan Ness to Collieston Coast SPA.

3.19 No records were made for guillemot at Lunderton Bay during the breeding season with 12 birds recorded offshore in February 2023.

Herring Gull

3.20 Herring gull (Red-listed in BoCC) are a designated breeding species of the Buchan Ness to Collieston Coast SPA.

3.21 At Lunderton Bay, herring gull were recorded on every visit as part of breeding season counts. Birds mostly used this area for roosting but were also recorded feeding here on three occasions during the breeding season. True maximum counts were in the non-breeding season for this species with 34 birds at low tide in November 2022, and 144 birds at high tide in October 2023. During the breeding season, maximum count at low tide was 48 birds in May 2023, and 7 birds at high tide in July 2023.

Kittiwake

3.22 Kittiwake (Red-listed in BoCC) are a designated breeding species of the Buchan Ness to Collieston Coast SPA.

3.23 At Lunderton Bay, kittiwake were recorded in April 2023 only, where they were seen to be feeding over the sea with the 500 m survey buffer. This record was made at low tide, at consisted of 33 birds.

Sandwich Tern

3.24 Sandwich tern (Annex 1; amber-listed in BoCC) designated breeding species of both the Ythan Estuary, Sands of Forvie, and Meikle Loch SPA, and the Loch of Strathbeg SPA.

3.25 At Lunderton Bay, sandwich tern was recorded in June, July, and August 2023. They were usually observed feeding but were only loafing on one occasion. Maximum count at low tide was 26 birds in June 2023, and a single bird at high tide in July. The true maximum count for high tide was made out with the breeding season, with 5 birds recorded in September

Shag

3.26 Shag (Amber-listed in BoCC) are a designated breeding species of the Buchan Ness to Collieston Coast SPA.

3.27 At Lunderton Bay, shag were recorded in April, July, and August 2023. The birds were always noted to be feeding in the area. True maximum counts were made in non-breeding season, with 350 birds at low tide in March 2023, and 59 birds at high tide in January 2023. During the breeding season, low tide maximum count was 109 in April 2023, and four for high tide in July.

Cable Corridor Zones and Substation

Non-breeding Season

Wildfowl

3.28 Pink-footed goose (designated non-breeding species of Loch of Strathbeg SPA) was recorded on eight occasions in flight over the site. Flock size ranged from one to 1800 geese. No pink-footed geese were recorded on the ground, or actively using the site, at the time wintering surveys took place. A Wildlife and Wetlands Trust study[3] showed that pink-footed geese utilised areas of the cabling route, namely areas surrounding Peterhead Golf Course (i.e. the landfall zone overlapping with Cable Corridor zone A), and in the south-west section of the route, near the proposed SSEN Netherton Hub (cable corridor zone B).

3.29 Greylag goose (Amber-listed in BoCC) was recorded on three occasions in flight over the site. Flock size ranged from 20 to 30 geese. A preferred foraging site was noted during winter survey effort, but this lies approximately 1.1 km west of the 500 m buffer around the proposed route.

3.30 Two whooper swan were recorded on one occasion feeding in a field out with the 500 m cabling route survey buffer.

3.31 Teal were also recorded around the same area as greylags were recorded foraging, at a small pond approximately 400 m south of Longside.

3.32 Mallard (Amber-listed in BoCC) were recorded flying over the site on occasion. No interaction with the survey buffer was recorded with mallard on the ground. All mallard records made were ultimately out with the 500 m survey buffer.

3.33 Results from the non-breeding season are shown in **Volume 2, Figure 8.3**.

Raptors

3.34 Raptor sightings were fairly limited, in agreement with data obtained from the RSPB and NBN.

3.35 A ringtail (either a juvenile or adult female) hen harrier (Schedule 1; Annex 1; Red-listed in BoCC) was recorded on one occasion during non-breeding season surveys. This individual was seen to be hunting low over agricultural land at the terminus of Cable Corridor Zone B, just south of the proposed SSEN Netherton hub.

3.36 Short-eared owl (Annex 1; Amber-listed in BoCC) was flushed during non-breeding surveys from a fence line near the Formartine and Buchan Way, within the 500 m survey buffer. This individual after leaving its perch was observed hunting before leaving the area.

3.37 Buzzard (*Buteo buteo*) and kestrel (*Falco tinnunculus*) were recorded occasionally within the survey buffer.

[3] Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

Waders

3.38 Snipe (*Gallinago gallinago,* Amber-listed in BoCC) were recorded on 4 occasions within the survey buffer for the cabling route. These were usually individuals flushed from the ground or verges. On one occasion a small flock of 10 individuals were observed feeding in a field before flying off.

3.39 Lapwing were recorded frequently during non-breeding season surveys in flight. Flocks were also observed on the ground roosting, with flock size ranging between 14 and 65 birds. These records were ultimately out with the survey buffer, with the closest record being 100 m away.

3.40 Curlew (*Numenius Arquata,* Red-listed in BoCC) were recorded occasionally in flight over the site. Curlew were also recorded approximately 100 m out with the survey buffer feeding in a field on four occasions.

Passerines

3.41 Corn bunting (*Emberiza calandra,* Red-listed in BoCC) were noted as present on three occasions during non-breeding surveys. These birds were always recorded as individuals and were either perched or heard calling.

3.42 Tree sparrow (*Passer montanus,* Red-listed in BoCC) was observed on five occasions, perched in trees or hedgerows during non-breeding season surveys. These birds were of single birds on three occasionas, whilst a flock of 60, and a flock of 31 were recorded on the other two instances.

Other species

3.43 Grey Heron (*Ardea cinerea*) was recorded occasionally, usually near small streams.

3.44 Golden plover (*Pluvialis apricaria*, Annex 1) was observed in flight over the site on one occasion.

3.45 Herring gull were observed frequently roosting or feeding in fields in a range of flock sizes, usually in mixed flocks with other gulls including black-headed gull, lesser black-backed gull, common gull, and occasionally, great black-backed gull.

Breeding Season

Herring Gull

3.46 The only designated breeding SPA species making use of the land of the cabling route during the breeding season, herring gull were recorded on five occasions during the breeding season. Two of these records are ultimately out with the 500 m survey buffer for the cabling route. Of the three records made within the cabling route survey buffer, two of these were flocks of 60 and 144 birds which were seen foraging, attracted by a farmer turning up the soil, while the remaining sighting was of an individual loafing in field.

3.47 No breeding evidence was recorded for this species during the surveys.

Passerines

3.48 Yellowhammer (*Emberiza citronella,* Red-listed in BoCC) was recorded frequently, usually found in hedgerows. Males and females were observed, sometimes alone and sometimes as pairs. Males were note on several occasions to be singing. A female was noted to be alarm calling within 500 m of the substation in a hawthorn hedgerow. With this evidence taken into account, yellowhammer can be confirmed to have bred on site.

3.49 Tree sparrow was also recorded frequently, usually in small groups. Birds were noted to call frequently and alarmed when surveyors were nearby. It is probable that this species bred on or adjacent to the site.

3.50 Corn bunting was recorded on one occasion during the breeding season in the substation area and was of a single bird calling. Due to the surrounding habitat, it is possible corn bunting bred on or adjacent to the site adjacent to the substation zone. Surveys in the cable route corridor suggest that a further pair was present in the south-west of the RLB.

3.51 Linnet (BoCC Red-list) was recorded during surveys. However, no birds were recorded as singing from a perch and as such no confirmed breeding was noted.

3.52 Reed bunting (*Emberiza schoeniclus*, Amber-listed in BoCC) was recorded on several occasions, with most records of singing males. It is probable that this species bred on or adjacent to the site.

Other Species

3.53 An oystercatcher (*Haematopus ostralegus,* Amber-listed in BoCC) was recorded approximately 700 m east of the site of the proposed substation and was roosting in a pasture field.

3.54 Lapwing were noted twice in the south-west of the route, as individual birds in both instances. The birds were recorded calling and flying low to the ground over agricultural land.

3.55 Curlew were recorded on two occasions, both as individual birds. Both records observed birds calling within thick vegetation. It is possible that this species bred on or adjacent to the site.

3.56 Results relating to the breeding season are shown in **Volume 2, Figure 6.2-6.4.4**.

Chapter 4
Discussion and Interpretation

Desk Study

4.1 A desk study was undertaken to inform the ornithological assessment. An account of the methods adopted, and findings, is provided in **Appendix 6.1** which also sets out the legislative provisions afforded to birds.

4.2 The desk study recorded no statutory or non-statutory sites within the survey area (to 500 m of the Proposed Development RLB).

4.3 The following designated sites, with potential connectivity to the Proposed Development due to the foraging ranges of their qualifying features, are present however:

- Loch of Strathbeg SPA/Ramsar/SSSI;
- Buchan Ness to Collieston Coast SPA (within which lies Bullers of Buchan Coast SSSI); and
- Ythan esturary, sands of Forvie and Meikle loch SPA.

4.4 Buchan Ness to Collieston Coast SPA which lies 5.5 km south-east of the site and is designated for its breeding seabird assemblage including fulmar (*Fulmarus glacialis*), guillemot (*Uria aalge*), herring gull (*Larus argentatus*), kittiwake (*Rissa tridactyla*), and shag (*Gulosus aristotelis*).

4.5 The Loch of Strathbeg SPA, which is also a RAMSAR site, lies approximately 8 km to the north-northwest of the site at its closest point. The Loch of Strathbeg SPA is designated for a variety of non-breeding/ wintering species including goldeneye (*Bucephala clangula*), greylag goose (*Anser anser*), pink-footed goose (*Anser brachyrhynchus*), sandwich tern (*Thalasseus sandvicensis*), barnacle goose (*Branta leucopsis*- Svalbard population), teal (*Anas crecca*), and whooper swan (*Cygnus cygnus*) as well as a wider waterfowl assemblage.

4.6 Approximately 14 km south-southeast of proposed development at its closest point, lies the Ythan Estuary, Sands of Forvie, and Meikle Loch SPA, which is designated for breeding common tern (*Sterna hirundo*), little tern (*Sterna albifrons*), and sandwich tern. This SPA is also designated for non-breeding species including eider (*Somateria mollissima*), lapwing (*Vanellus vanellus*), pink-footed goose, redshank (*Tringa totanus*), and its waterfowl assemblage.

SSSIs in the surrounding area, which are designated for ornithological features, are the Loch of Strathbeg SSSI designated for its breeding bird assemblage and overlaps with the Loch of Strathbeg SPA. Bullers of Buchan Coast SSSI comprises the cliffs which lie within the Buchan Ness to Collieston Coast SPA and are designated for breeding guillemot and kittiwake

4.7 The field study surveys were carried out with reference to those species and species' groups.

Field Study

Designated sites

4.8 A number of species which can be linked to SPAs by core foraging ranges (connectivity) were recorded during surveys (refer **Table 4.1** below. Of these, shag, Sandwich tern and goldeneye had maximum counts during the surveys which were of more than 1% of their respective SPA designated populations:

- Shag (Buchan Ness and Collieston Coast SPA)
- Sandwich tern (Buchan Ness and Collieston Coast SPA and Loch of Strathbeg SPA)
- Goldeneye (Loch of Strathbeg SPA)

Table 4.1: Summary data

Species	Population	Numbers recorded on surveys	Discussion
Designated Sites			
Buchan Ness & Collieston Coast SPA			
Herring gull	4,292 pairs	48 in breeding season	
Shag	1,045 pairs	104	Shag were recorded during the breeding season surveys for the Landfall Zone. Up to 104 birds were present at the start of the breeding season (5% of the SPA population). Shag were noted as feeding within 500 m of the shoreline. Birds can forage to 17 km distant from their colonies, however average foraging distance is 5.9 km.
Guillemot	8,640 pairs	0 in breeding season 12 in non-breeding season	Guillemot forage considerable distances out to sea and away from the colony (on average 24 km, but distances to 200 km from the nesting site recorded). Birds were recorded at Lunderton Bay only out with the breeding season when <0.1% of SPA population was recorded.
Black-legged kittiwake	30,452 pairs	33	Black-legged kittiwake forage to 80 km from their colony. A maximum count of < 0.1% of the SPA population was recorded during landfall surveys
Loch of Strathbeg SPA/Ramsar/SSSI			
Sandwich tern	280 pairs	26	Sandwich tern were recorded foraging offshore at the landfall zone. Sandwich tern forage up to 49 km from their nesting sites. Maximum count was 5% of the SPA population within survey area.
Pink-footed goose	27,500 individuals	4	Core foraging range of pink-footed geese is from 15-20 km from their (SPA) roost sites. Therefore, potential connectivity is present for the species to the Proposed development. No foraging birds were encountered within the substation footprint. A foraging flock of 4 pink-footed geese only, was recorded within the survey area. Flight activity was recorded over the survey area; however, no collision risk is present for the Proposed Development. Flock size ranged from one to 1800 geese. Significantly less than 1% of the SPA population recorded using the Site.
Greylag goose	5,565 individuals	0 (flight only)	Core foraging range of greylag geese is from 15-20 km from their roost sites. Therefore, potential connectivity is present for the species to the Proposed development. No core foraging sites are present (Mitchell, 2012) with

Species	Population	Numbers recorded on surveys	Discussion
			numbers of the species considerably reduced from the early 1990's. Greylag goose (Amber-listed in BoCC) was recorded in flight over the site, only. Preferred foraging site over 1.5 km west of the proposed cabling route. Significantly less than 1% of the SPA population recorded during surveys.
Whooper swan	245 individuals	2	Recorded out with the 500 m cabling route survey buffer only. The core foraging range of the species is considered as 5 km- with the birds recorded during the surveys not associated with the SPA population. Significantly less than 1% of the SPA population recorded during surveys.
Goldeneye	150 individuals	4	Recorded offshore from the landfall point only, August and October recorded max counts of 4 individuals foraging. These birds are likely part of the NW European population that over-winters across the UK, including along the coastline. The numbers recorded would be 3% of the Loch of Strathbeg SPA population, however the distance from the SPA roost to the landfall site makes this unclear as to whether they are SPA birds.
Ythan estuary, Sands of Forvie and Meikle Loch			
Pink-footed goose	17,213 individuals	4	As per Loch of Strathbeg
Sandwich tern	1125 pairs	26	As per Loch of Strathbeg; maximum count c. 1% of the SPA population.
Schedule 1/Annex 1 species			
Hen harrier	c. 500 pairs	1 non-breeding record	A single hen harrier was recorded during surveys. No suitable breeding habitat is present for the species within the development zones. Significantly less than 1% of the national population recorded using the Site.
Red-throated diver	17,000 (UK wintering population)	Max. 12 offshore	Red-throated diver was recorded in the non-breeding season only, with up to 12 birds present offshore from the Landfall zone. Significantly less than 1% of the national population recorded in the survey area.
Kingfisher	230-450 pairs	Desk record only	Kingfisher is known to use the River Ugie for foraging during the winter months. The Schedule 1 species does not breed locally, however, and with no records of the species during surveys. A single desk study record in the last 10 years was to the south of the RLB (a breeding-season record). Significantly less than 1% of the national population recorded in the survey area

Species	Population	Numbers recorded on surveys	Discussion
Short-eared owl	620 pairs	Desk record only	The east coast of Scotland provides suitable non-breeding foraging and roosting habitat for short-eared owl. It is likely that the RLB is used on occasion by the species.
Common scoter	80 pairs; 30,000 wintering	Max. count 27	Common scoter spend the non-breeding season foraging offshore, congregating in flocks of up to several hundred birds in suitable foraging areas. The max count represents significantly less than 1% of the Scottish wintering population. These birds may represent birds flocking before heading inland to breeding sites, potentially in Scotland or out with in Northern Europe.
Velvet scoter	3,500 wintering	1 record	A single record of velvet scoter was recorded during the landfall/intertidal surveys.
Long-tailed duck	15,000 wintering	Max. count 18	As the scoter species, long-tailed duck forage along the north UK coast associating with clam beds and amphipod concentrations. The max count of 18 birds represents significantly less than 1% of the UK population.
Birds of Conservation Concern (Red-list)			
Landfall zone			
Arctic skua	785 pairs	Max. count 1	Arctic skua was recorded during landfall zone surveys chasing Sandwich terns on 2 occasions. The bird, likely non-breeding individual(s), represents significantly less than 1% of the Scottish breeding population.
Ringed plover	4,500-5,000 pairs	Max. count 32	The maximum count of roosting ringed plover represents c. 1% of the National population of the species. No breeding was suspected to have occurred, however, the beach at Lunderton with a high-water line close to the dunes.
Cable Corridors			
Curlew	58,000 pairs	1 pair in RLB Max. count 10	Curlew were recorded at the landfall zone during the non-breeding season. A single pair were present within the cable corridor and thought to be breeding. The local area is not considered to be of high value for the species (BTO data), however (sensitivity rating of 1 of 5) and as such the RLB does not represent important habitat.
Lapwing	50,000 pairs	1-2 pairs within RLB	Lapwing were recorded within the Cable corridor with up to 2 pairs breeding in agricultural fields. BTO sensitivity mapping shows much of the RLB as being of average (sensitivity rating 3 of 5) or good (rating 4 of 5) habitat suitability for the species. The 2 pairs

Species	Population	Numbers recorded on surveys	Discussion
			represent significantly less than 1% of the Scottish population.
Tree sparrow	4,600-8,1000 pairs	3 pairs in RLB	Tree sparrow was recorded as a breeding bird within the cable corridor zones of the Proposed Development. 3 pairs represent significantly less than 1% of the national population.
House sparrow	600,000-900,000 pairs	Present in RLB	House sparrow breeding in the RLB generally associated with farmsteads and neighbouring hedgerows in the local area.
Yellowhammer	140,000 pairs	>5 pairs in RLB	Yellowhammer were recorded as breeding within the cabling corridor zones and substation zone of the Proposed Development. With 5+ territories recorded this represents significantly less than 1% of the Scottish population of the species.
Corn bunting	800 pairs	1 pair in RLB	At least 1 pair was present within Cable Corridor zone B at the south-west of the RLB. Birds were also recorded in the non-breeding season here. The north-east of Scotland is a stronghold of the species, with the RLB (corridors and substation) potentially holding c. 0.5% of the Scottish population of the species.
Linnet	70,000-90,000 pairs	Present in RLB	Linnet likely breeding in RLB of cable corridors, although not confirmed.
Substation zone			
Yellowhammer	140,000 pairs	1 pair	1 pair present in the substation zone only.
Corn bunting	800 pairs	1 pair	1 pair present in the substation zone only

Schedule 1/Annex 1 species

4.9 Two Schedule 1/Annex 1 species were recorded during surveys with a further two noted from desk studies. The Site appears to be of limited importance for all Schedule1/Annex 1 species.

Birds of Conservation Concern (BoCC)

4.10 A number of BoCC Red-list species were recorded. Of these, curlew, lapwing, corn bunting, tree sparrow and yellowhammer were recorded as breeding within the proposed development RLB including within the substation area. Habitat loss, including the removal of existing hedgerows during construction, as well as the increase in associated disturbance, will potentially lead to the loss of all breeding territories within the RLB in the short-term, at least.

Annex A: Intertidal Survey Tables

Bird survey results – Lunderton Bay (max. counts across all low and high tides and max. count per month)

Lunderton Bay	Max Count High Tide	Max Count Low Tide	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Arctic skua[4]	1	1										1	1							
Arctic Tern		10											10							
Black-headed gull	13	7		13		3					1				7					
Cormorant	1	7							7		1				1				1	
Common gull	31	131			6	4	31		57	11	6				17	8	2		131	
Curlew		10											2		10					1
Common scoter		27							27	18										
Dunlin	48																48			
Eider	53	45			45	53	34	5	17	9	2					18			14	
Great black-backed gull	7	8			2	7	1	8			1		1					1		

[4] BoCC red-list species

Lunderton Bay	Max Count High Tide	Max Count Low Tide	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Guillemot[5]	12					7	12									2		2		
Gannet	9	46			4				46			3	15	9						
Goldeneye	2	4											4	2	4					
Grey Heron		1									1									
Herring gull	34	144		34		9	9	80	6	48	12	7	1		144	21		3	2	4
Kittiwake		33							33											
Long-tailed duck	18	3					18									3			2	
Great northern Diver	2															2				
Oystercatcher	6	4		6				2			4							1		
Pink-footed Goose		4																	4	
Razorbill	34	60				3	34	60	44				21	12	8	6			1	8
Red-throated diver[6]	12	6				2	12	6	2							1			1	1

[5] Qualifying species that form part of a Designated site
[6] **Schedule 1 species**

Lunderton Bay	Max Count High Tide	Max Count Low Tide	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Redshank	20	3		15	3		4										20			3
Red-breasted merganser	1															1				
Ringed plover	32	14		16	2					14						23	32	1		
Shag	59	350			80	59	16	350	104			4	57		7	6				11
Sanderling	9	12								12						9	3			
Teal	4													4						
Sandwich Tern	5	26									26	1	13	5						
Turnstone	10			10													3			
Velvet Scoter		1						1												

Annex B: Weather Tables

Weather recorded during intertidal surveys

Site	Session Date	Visibility	Wind Force	Wind Direction	Precipitation	Tide Survey	Tide time
Lunderton Bay	20/10/2022	>5 km	2	E	light rain	High	10:47
Lunderton Bay	23/11/2023	>5 km	3	S		High	11:01
Lunderton Bay	14/12/2022	>5 km	3	NW		Low	10:06
Lunderton Bay	11/01/2023	>2 km	4	NE	light rain	High	15:13
Lunderton Bay	20/02/2023	>5 km	2	W		High	13:35
Lunderton Bay	15/03/2023	>5 km	2	S		Low	11:51
Lunderton Bay	13/04/2023	>2 km	3	ENE		Low	12:21
Lunderton Bay	11/05/2023	>0.5 km	1	NNE		Low	11:44
Lunderton Bay	13/06/2023	>5 km				Low	16:06
Lunderton Bay	19/07/2023	>5 km	3	NNE		High	15:08
Lunderton Bay	09/08/2023	>5 km	5	NW		Low	13:44
Lunderton Bay	13/09/2023	>5 km	3	SE		High	13:19
Lunderton Bay	11/10/2023	>5 km	6	W		Low	17:25
Lunderton Bay	16/11/2023	>2 km	2	NNW		High	14:25
Lunderton Bay	14/12/2023	>5 km	3	WSW		High	13:32
Lunderton Bay	19/01/2024	>5 km	2	SW		Low	12:59
Lunderton Bay	07/02/2024	>5 km	1	W		Low	16:57
Lunderton Bay	13/03/2024	>5 km	2	SW		High	14:52

A.1 Weather recorded during cabling route walkover survey sessions (*Precipitation codes: 0 – dry; 1 – intermittent light rain; 2 intermittent heavy rain; 3 – continuous light rain; 4 – continuous heavy rain; S – snow; H – hail)

Session Date	Cloud cover (10ths)	Cloud height (m)	Wind force	Wind direction	Visibility (km)	Precipitation*	Surveyor
27/09/2023	10	600	4	SSE	5	0	DW
28/09/2023	2	700	1	SW	5	0	DW
10/10/2023	7	1000	5	S	5	2	AM
11/10/2023	1	1500	6	W	5	0	AM
15/11/2023	8	1200	3	NW	5	0	SK
16/11/2023	7	1000	2	W	5	0	SK
13/12/2024	3	1000	2	ESE	5	0	VC
14/12/2024	1	1500	3	SW	5	0	VC
18/01/2024	10	600	2	SW	3	1S	DW
19/01/2024	2	1000	1	WNW	5	0	DW
06/02/2024	7	800	6	WNW	5	1	AM
07/02/2024	4	1000	4	W	5	1S	AM
12/03/2024	10	900	1	SE	5	0	DW
13/03/2024	9	1200	3	SE	5	0	DW
30/04/2024	10	800	3	SE	5	0	DW
01/05/2024	10	700	2	SSE	5	0	DW
30/05/2024	9	800	5	WSW	5	0	DW
31/05/2024	4	1100	3	NW	5	0	DW