7 Ornithology

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7 Ornithology

7.1 Executive Summary

Following consultation with Nature Scotland, a suite of ornithological surveys was adopted for the purposes of assessing the avian baseline conditions for the Proposed Development. The surveys included: vantage point surveys, breeding bird surveys, breeding seabird surveys and storm petrel surveys, all undertaken between April 2019 and August 2020.

Three species of high conservation value; raptor and owl, and two species of common raptor were registered during the full year of vantage point surveys. None were assessed as breeding within the site or within the 2 km survey area. Ten species of wildfowl and divers were recorded during the non-breeding season, while only two species were noted during the breeding season red-throated diver and greylag goose with only greylag goose confirmed as breeding. Three species of gull were recorded as breeding on the island with a further two species recorded during both the non-breeding seasons. Ten species of waders were recorded, six were recorded as breeding. Storm petrels were recorded as breeding within stone structures and boulder piles in both 2019 and 2020 predominantly located within a stone dyke running around the northern perimeter of the island. Small numbers of Arctic tern and a single great skua territory were recorded during surveys while black guillemot, fulmar and shag were abundant on the cliffs and boulders around the island fringes.

Although the levels of recorded flight activity are considered to be low or moderate, for the purposes of completeness, collision risk modelling was undertaken for greylag goose, red-throated diver, great skua, lapwing, oystercatcher, golden plover and curlew. Night-time flight activity surveys were undertaken for storm petrel but due to the low levels of flight activity at collision risk height no analysis was undertaken for this species.

An assessment of ornithology effects arising from the construction and operation of the Proposed Development was undertaken, based on the current proposed layout and turbine dimensions. Through a standardised evaluation method, Important Ornithological Features were identified and brought forward for assessment. Important Ornithological Features taken forward for further consideration include one designated site (Mill Loch Site of Special Scientific Interest (SSSI)) and 13 species and species groups (greylag goose, red-throated diver, lapwing, oystercatcher, redshank, golden plover, ringed plover, curlew, great skua, Arctic tern, black guillemot, shag and gull species).

In line with guidelines, the impact assessment process assumes the application of standard mitigation measures. With these in place, predicted effects were considered to be barely perceptible and therefore not significant for all Important Ornithological Features. With further specific mitigation detailed, residual effects for construction and operation phases are considered to have barely perceptible adverse significance, i.e. not significant whereas proposed enhancement measures proposed for breeding storm petrels is predicted to have a long-term significant beneficial effect on the breeding population.

Likely cumulative effects of nearby operational developments, as well as those currently consented or at application stage of planning, were also considered and no significant cumulative effects are anticipated as a result of the Proposed Development.

7.2 Introduction

Scope of Study

7.2.1 This chapter considers and provides an assessment of the likely effects of the Proposed Development on the ornithological interests covering both the area of the island of Faray above Mean Low Water (MLW), i.e. 'the site', and the surrounding area. The Proposed Development also covers an area below the MLW to the south-east of the island, this larger area is the 'Proposed Development boundary'.

7.2.2 This chapter presents the baseline ornithological interests and considers the likely impacts of the Proposed Development on notable species, while focusing on Important Ornithological Features (IOFs).

7.2.3 Likely ornithological effects of the Proposed Development are outlined and an assessment is provided based on the value of the receptor and the magnitude of the impact giving the significance of the effect. Where appropriate, mitigation measures to enhance, prevent, minimise or control identified ornithological effects are presented and residual ornithological effects following the adoption of those measures are assessed.

7.2.4 This chapter (and its associated figures) is not intended to be read as a standalone assessment. As such, reference should be made to Technical Appendices 7.1 Avian Baseline Conditions, 7.2 Collision Risk Modelling and 7.3 Storm Petrel Report, as well as other chapters of this EIA Report as referenced appropriately.

7.2.5 Likely ornithological effects associated with the development of a wind farm can occur throughout the three main phases of a wind farm's lifespan (construction, operation and decommissioning) and may include: direct habitat loss and indirect effects on habitat quality, mortality from collision with turbines and disturbance and displacement effects.

Description of the Site

7.2.6 The site comprises the island of Faray, an uninhabited island to the north and west of Eday and south-southeast of Westray in the Orkney Islands. The smaller island Holm of Faray is immediately to the north. Faray is approximately 17 km northeast of Mainland Orkney, and approximately 25 km from Kirkwall.

7.2.7 The site comprises two hillocks with the southern-most forming approximately the central point of the island, rising to 32 m Above Ordnance Datum (AOD). Approximately 700 m to the north a second hill rises to 31 m AOD. The ground level falls away fairly gently from the two hills, the steepest slope being near the coast to the west of the southern hill. The coastline is generally defined by rocky cliffs with geos and caves, except on the west coast near the north of the island and on the far southeast coast, where there are stretches of beach.

7.2.8 A number of abandoned dwellings are present on the island, the majority of which have lost their roofing. The island is used by a crofter to graze sheep throughout the year.

Statement of Competence

7.2.9 The assessment has been carried out in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM) by Allan Taylor (BA (Hons), MSc. ACIEEM) and Richard King (BSc (Hons), MSc., MCIEEM), ecologists and ornithologists with over 20 combined years' experience.

7.3 Legislation, Policy and Guidelines

7.3.1 Relevant legislative and avian census documents have been taken into account as part of this ornithological assessment. Of particular relevance are:

- Council Directive 2009/147/EC on the conservation of wild birds (i.e. the "Birds Directive");

- The Ramsar Convention on Wetlands (1975);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Scottish Biodiversity Strategy, with Scottish priority species and habitats listed on the Scottish Biodiversity List (SBL), is also pertinent and is based on the former UK Biodiversity Action Plan (UK BAP), and regional biodiversity targets defined through the Orkney Local Biodiversity Action Plan (LBAP) (Orkney Islands Council, 2013); and
- Eaton *et al.* (2015), Birds of Conservation Concern (BoCC) 4: the Population Status of Birds in the United Kingdom, Channel Islands and the Isle of Man.

Planning Policy

7.3.2 Chapter 5 of this EIA Report sets out the planning policy framework that is relevant to the EIA process. The policies set out include those from the Orkney Local Development Plan (LDP) (2017), those relevant aspects of Scottish Planning Policy (SPP), Planning Advice Notes and other relevant guidance. In addition to policies within SPP and the LDP relevant to ornithology and nature conservation, regard has been had to the Planning Advice Note (PAN) 60: Planning for Natural Heritage (amended in 2008).

Best Practice Ornithological Guidance

7.3.3 As well as detailed consultation with NatureScot (NS), formerly Scottish Natural Heritage (SNH), current best practice guidance on assessing ornithological interests in relation to onshore wind farm developments was followed. A full description of relevant guidance is presented in Technical Appendix 7.1; however, of particular relevance to ornithology are:

- Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018);
- Guidelines for Environmental Impact Assessment (Institute of Environmental Management and Assessment (IEMA), 2005);
- Survey Methods for Use in Assessing the Impacts of Onshore Wind Farms on Bird Communities (SNH, 2017);
- Windfarms and Birds: Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000);
- Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model (SNH, 2018a);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band *et al*. 2007);
- Assessing Significance of Impacts from Onshore Windfarms on Birds outwith Designated Areas (SNH, 2018b);
- Assessing the Cumulative Impacts of Onshore Wind Farms on Birds (2018c);
- Assessing Connectivity with Special Protection Areas (2016); and
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012).

7.4 Consultation

7.4.1 Table 7.1 provides details of consultations undertaken with relevant regulatory bodies, together with action undertaken by the Applicant in response to consultation feedback.

Table 7.1 – Consultation Responses

Consultee	Consultation Response	Applicant Action
Orkney Islands Council (Case Officer: Environment) Scoping Opinion 26th April 2019	Several SSSIs and Special Protection Areas (SPA) for birds are located within foraging range of Faray. An assessment should be undertaken of the likely direct and indirect effects of the proposal on the qualifying interests of these sites. Mill Loch SSSI on the neighbouring island of Eday is designated for breeding Red-throated diver and this species may be particularly at risk of collision with rotating turbine blades, as they travel between their nesting sites and feeding areas in the marine environment.	All points noted and all designated sites are taken into account in the assessment.
	The assessment should address the effects of all stages of the proposal on the bird species of these sites, including collision risk. Vantage Point surveys should be undertaken in line with current guidance which may be accessed from the SNH website at www.nature.scot, and advice should be sought from SNH on the scope and frequency of these surveys, as well as potential vantage point locations. It should also consider the cumulative impact of the proposal with other wind turbine developments, including any wind energy proposals which are currently in the planning system. Information on the qualifying features of the relevant internationally and nationally designated sites is available from 'SiteLink' which may be accessed from the Scottish Natural Heritage website at https://sitelink.nature.scot/home.	All points noted and all survey were completed following the SNH wind farm guidance and JNCC seabird monitoring handbook. Consultation with SNH/NatureScot was ongoing throughout the duration of the survey period. All other wind farms in Orkney have been taken into consideration as part of the cumulative assessment.
	Ornithology We welcome the commitment to undertake a breeding bird survey which will include a survey of breeding storm petrel, with follow up studies of nocturnal flight activity where necessary.	No additional action required.
	Supporting seabird survey data is available from JNCC's National Seabird Census. Faray and Holm of Faray were last surveyed in 2018 (see count	All historic seabird was taken into consideration with the

Consultee	Consultation Response	Applicant Action
NatureScot Scoping Opinion 26th April 2019	results at http://jncc.defra.gov.uk/smp/sitesBrowser.aspx?siteID=93797). Further details regarding the distribution/breeding locations in 2018 may be available from the national census coordinator.	ornithological desk study completed for assessment.
	We welcome the proposed checks for breeding storm petrels, given the lack of survey data since they were last recorded breeding on Faray and Holm of Faray in 2000. The standard methods for assessing collision risk do not apply to storm petrels because of their nocturnal behaviour, but we would be happy to discuss the need for any further assessment that might be required should storm petrel breeding colonies or other significant activity be recorded. See additional advice below regarding the potential effect on birds of any lighting that may be required on the turbines for aviation safety.	Consultation regarding storm petrel activity surveys was completed in January and February 2020, with the detailed approach approved by NS by email on 19th February 2020 which included continuing nocturnal surveys at proposed turbine locations to best assess collision risk for this species.
NS phone conversation and email confirmation from Senior Casework Manager 20th December 2019	Following on going consultation and the provision of all of the first year's survey results NS were asked for clarification on whether it was considered necessary to undertake further survey for the site. Following discussions on the first year of survey results it was agreed that there was "no need for a second year of VP surveys, breeding seabird (except potentially storm petrel) and breeding bird walkover surveys." NS responded: *"Yes, that's right. Though the gaps in storm petrel data include potential deficiencies in the VP survey as well the breeding survey."*	A second year of storm petrel breeding survey and storm petrel activity surveys was completed, but in order to allow for comparison the callback survey in 2020 was completed using a standardised playback storm petrel call that was used during storm petrel breeding surveys on Mousa, Shetland.
RSPB Scoping Opinion 26th April 2019	Having examined the scoping report, we wish to reiterate comments made by SNH regarding the welcome inclusion of a survey of breeding storm petrels, with follow-up nocturnal flight activity where necessary. You may find the following links useful for determining monitoring methods for storm petrels: a paper evaluating the use of infrared video http://rdcu.be/xGKt; and a paper on the most recent surveys on Mousa, giving useful details on playback survey methodology http://www.seabirdgroup.org.uk/seabird-30-15.	All points noted.

Consultee	Consultation Response	Applicant Action
	On the survey effort point, we do not support the proposal to undertake only one years' worth of data collection. A lack of two years' worth of data will serve to increase any uncertainties in the assessment and devalue the robustness of its conclusions. As stated in the Scoping Report, there are a number of designated sites, including SPAs and pSPAs, within 20 km of Faray. Due consideration should be given to potential connectivity to these sites, particularly with regard to the collision risk impacts on their qualifying features and any in-combination impacts from other relevant developments.	See NS response (20th December 2019) above. The site comprises grazed grassland low level cliffs which provide good breeding habitat for typical coastal and grassland species in Orkney. No breeding habitat was recorded for other target species, including hen harrier, merlin and red-throated diver, on the site or within 2km of the site. A second year of data collection was completed for the key ornithological interest on the site with a second full storm petrel callback survey and a second season of nocturnal activity surveys.

7.5 Assessment Methodology and Significance Criteria

7.5.1 This section identifies the 'key ornithology and nature conservation issues' which have been considered as part of the Ornithological Impact Assessment, describes the methods used to establish baseline conditions and assess the magnitude and significance of the likely ornithological effects of the Proposed Development.

Design Iteration

7.5.2 The following assessment is based on the final site layout, which has undergone various iterations over an extended process that has taken into account for a variety of potential constraints. Ultimately, the final design (Figure 1.2) is one that has taken into consideration all of these constraints to lessen the potential for any impacts to be experienced by any single receptor across the variety of disciplines that have all provided input into the Proposed Development's final layout (further details on design iteration provided in Chapter 2). There will be a micro-siting allowance of up to 50 m in all directions in respect of each turbine and its associated infrastructure in order to address any potential difficulties which may arise in the event that preconstruction surveys identify ornithological (or other) constraints that could be avoided. The assessments within this chapter has taken considerations of this 50 m micro-siting and it does not alter the conclusions formed as to likely effects.

Desk Study

7.5.3 A desk study was undertaken of web-based resources to identify baseline data for the Proposed Development site and wider area. Where relevant, the desk study was supplemented through consultation with relevant non-statutory organisations for a 5 km radius of the Proposed Development. Further details on the desk study can be found in Appendix 7.1.

Site Scoping Visit

7.5.4 The scope of the ornithology surveys, including field survey methods and vantage point (VP) survey locations, were developed and agreed with NS, taking cognisance of current best practice guidance (SNH, 2017).

Field Studies

7.5.5 Ornithology field surveys for the Proposed Development were carried between April 2019 and March 2020 and in July 2020.

7.5.6 Surveys were carried out at a variety of times and in different weather conditions to ensure data were collected that were fully representative of a range of behaviour patterns.

7.5.7 SNH (2017) guidance indicates that wind farm assessments should focus on 'target species'. NS defines ornithological target species as:

- Those protected under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- Those listed on Annex 1 of the Council Directive 79/409/EEC on the Conservation of Wild Birds;
- Regularly occurring migratory species which are either rare, vulnerable or warrant species consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas in relation to the proposed wind farm; and
- Species occurring at the site in nationally or regionally important numbers.

7.5.8 NS guidance goes on to note that consideration should be given to species of local conservation concern (i.e. those listed in LBAPs), but that target species should be restricted to those likely to be affected by wind farms. Pre-scoping consultation with NS, combined with the results of the data study, identified that survey work to inform the assessment should account for the potential presence of 'scarce' diurnal raptors, geese and wading bird species within and adjacent to the site.

7.5.9 A summary of the ornithological methods adopted is provided in this chapter, however, please refer to Appendices 7.1, 7.2 and 7.3 for full details.

Study Area

7.5.10 Appropriate study areas (i.e. the 'Survey Area') for each specific survey were derived from a combination of the practicalities of the site being an island surrounded by open sea with difficult access and best practice guidance (SNH, 2017) and are provided below and shown in Figure 7.1:

- Flight activity VP surveys: the island of Faray above MLW plus up to 500 m within 2 km of VP location;
- Breeding bird walkover survey: the island of Faray above MLW plus areas visible on Holm of Faray to the north up to 500 m;
- Wintering bird survey: the island of Faray above MLW plus areas visible up to 500 m;
- Breeding seabird survey: the island of Faray above MLW plus areas visible on Holm of Faray; and
- Storm petrel callback survey: the island of Faray above MLW.

Vantage Point survey

7.5.11 NS guidance advises that VP locations should be selected to achieve maximum visibility from the minimum number of survey locations. An arc of up to 180 degrees extending to 2 km from the observer can be effectively surveyed from each VP (subject to topography, vegetative screening and any other constraints to effective survey). A minimum of 36 hours of survey effort should be completed at each VP during both the breeding season and winter periods, and the timing of VP watches should be varied to ensure that all times of day are appropriately covered.

7.5.12 Two VP's, facing north and south at the same location were initially selected following review of aerial imagery and Ordnance Survey maps, and then ground-truthed during an avian site scoping visit completed in April 2019. The selected VP location was approved through consultation with NS prior to the commencement of surveys in April 2019. The location of the VP and the respective viewsheds are presented in Figure 7.1.

7.5.13 VP surveys were completed between April 2019 and March 2020. A total of 36 hours was undertaken at each VP during the breeding season and 36 hours at each VP during the non-breeding season. VP watches were conducted for periods of no longer than 3 hours in a single watch. A minimum 30 minute break was observed between watches to allow the observer an adequate rest time between VP watches.

Breeding Bird Survey

7.5.14 A walkover technique based on the Brown and Shepherd method (1993) was employed and covered the site and where possible a further 500 m survey buffer. The method involved approaching within 100 m of all parts of the Survey Area to record the presence of waders. Four survey visits were conducted during the period mid-April to early July in 2019, with a minimum two week gap between each of the survey visits. NS guidance (SNH, 2017) recommends that four survey visits should be completed over the breeding season, based on recommendations set out in Calladine *et al*. (2009). The breeding bird Survey Area (Survey Buffer (500m)) is shown in Figure 7.1.

7.5.15 It should be noted that due to the fact the site is an island no dedicated breeding raptor surveys were undertaken as breeding raptors would have been located during the breeding bird walkover. This was further supplemented by a data request from the ORSG for up to 2 km from the site.

Nesting Seabird Survey

7.5.16 Full island counts covering both the cliffs and island top were undertaken for the following species:

- Skuas (Arctic skua (*Stercorarius parasiticus*) and Great skua (*Stercorarius skua*)) – single walkover survey, visit mid-June to count adult birds on territory;
- Gulls – single visit using vantage points to count adults on nests, late-May to Early June;
- Arctic tern (*Sterna paradisaea*) – weekly visits using vantage points to count incubating adults, mid-May to mid-June;
- Black guillemot (*Cepphus grylle*) – two walkover surveys to count pre-nesting adult breeding birds from the cliff tops, undertaken on 30th April and 1st May 2019;
- Fulmar (*Fulmarus glacialis*) – a full island census by boat of apparently occupied nests, on 28th June;
- Shag (*Phalacrocorax aristotelis*) – a full island census by boat of apparently occupied nests, 30th May; and
- Storm petrel (*Hydrobates pelagicus*) – a full island callback survey, undertaken in June 2019 and repeated July 2020.

Winter walkover surveys

7.5.17 A winter walkover survey was completed between February 2020 and March 2020 to identify winter roosting and foraging bird populations within the Survey Area. The surveys were carried out in line with methods detailed in Gilbert *et al.* (2011) and consisted of three survey visits.

Survey Limitations

7.5.18 Access to the site, being a rugged, uninhabited island without a working landing area, is heavily reliant on good weather meaning undertaking surveys was significantly more difficult than a typical mainland site. The difficulties in accessing the island and the requirement to leave the site before

dark and arrival in good visibility means the hourly spread of surveys (i.e. dawn and dusk surveys) was more difficult to achieve than normal. The lack of nocturnal species on the island (i.e. owls) means this is not seen as a significant limitation to the survey data.

7.5.19 In addition, ITPE made a commitment not to undertake surveys between mid-September and December in order to prevent any potential for disturbance to breeding grey seals (*Halichoerus grypus*), for which parts of the island and entire coastline are designated as a Special Area of Conservation (SAC). The protected areas of the SAC include the area around the landing jetty meaning landing on the island during the seal breeding season had the potential to create unnecessary disturbance to seals and was therefore avoided (please refer Chapter 8: Terrestrial Ecology and Chapter 16: Underwater Noise Assessment for more details on this marine mammal SAC).

7.5.20 The gap in nonbreeding season surveys was further exacerbated by continued difficult weather conditions with high winds and large swell meaning landing on the island for surveys was not possible in December or January. Some survey visits were then condensed into a shorter period in March which could not be spread any further due to the impending lockdown due to covid-19, which was imminent. Despite the lack of temporal spread of data it is deemed unlikely there was any significant flight activity on the island over the winter months that differed significantly from the data collected in February and March.

7.5.21 Storm petrel activity surveys planned for June 2020 were delayed due to the covid-19 lockdown and were undertaken at the first possible time period it was considered safe and pragmatic to do so. They were completed in the second week of July 2020. This delay in surveys was not considered to significantly impact on the survey results.

Evaluation Methods for Ornithological Features

7.5.22 Table 7.2 lists the criteria used to determine the value of ornithological features in a geographical context.

Table 7.2 – Geographical Evaluation Criteria

Scale of Ornithological Value	Criteria	Examples
International	Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species, of international importance. N.B. For designations, such as a Special Protection Area (SPA), this may also include off-site features on which the qualifying population(s) are considered, from the best available evidence, to depend.	International nature conservation areas: – Any Special Protected Area (SPA); – Any potential SPA (pSPA); and – Any Ramsar wetland. Significant numbers of a designated population outside the designated area. Any species listed on Annex 1 of the Birds Directive. A site supporting more than 1 % of the EU population of a species.
National (Scotland)	Nature conservation resource, i.e. site or population of species, of national importance.	National nature conservation areas:

Scale of Ornithological Value	Criteria	Examples
	NB. Includes designated sites but may also include off-site ornithological receptors on which the qualifying population(s) of designated sites are considered, from the best available evidence, to depend.	– Any Site of Special Scientific Interest (SSSI) or National Nature Reserve (NNR) designated for ornithological feature(s). – A site supporting more than 1 % of the UK population of a species. – Nationally important population / assemblage of a species listed on Schedule 1 of the WCA.
Council area (Orkney)	Nature conservation resource, i.e. nature conservation designation, habitat or species, of importance on a county scale.	Statutory and non-statutory nature conservation designations: – Any Local Nature Reserve (LNR); – Any Local Nature Conservation Site (LNCS); – Any Scottish Wildlife Trust (SWT) reserve; – A council-scale important population / area of a species listed on the Scottish Biodiversity List (SBL) (Scottish Government, 2013) as requiring conservation action. A county-scale important population/area of a species listed on the LBAP. A county-scale important population / assemblage of species listed on Schedule 1 of the WCA.
Local (i.e. within 2 km of the site)	Nature conservation resource, e.g. a habitat or species of importance in the context of the local district	A breeding population of a species or a viable area of a habitat that is listed in a Local BAP because of its rarity in the locality. An area supporting 0.05-0.5 % of the UK population of a species. Any species included on the Birds of Conservation Concern (BoCC) Red List (Eaton *et al.*, 2015). A council-scale important population of an amber-listed species on the BoCC. A breeding population of a species on the SBL. All breeding populations of Schedule 1 species not captured in higher scale categories.
Less than local	Unremarkable, common and widespread habitats and species of little/no intrinsic nature conservation value.	Common, widespread, agricultural and/or exotic species (such as escapees).

7.5.23 Where a feature qualifies under two or more criteria, the higher value is applied to the feature.

7.5.24 In the context of this chapter, any ornithological feature of local or higher value is considered an Important Ornithological Feature (IOF).

Impact Assessment Methods

7.5.25 The approach taken to completing the Ecological Impact Assessment (EcIA) follows the established CIEEM guidelines for ecological impact assessment (CIEEM, 2018) and considers the factors described below.

7.5.26 The approach to Impact Assessment in this chapter of the EIA report (and Chapter 8: Terrestrial Ecology) differs slightly from the other chapters in order to ensure compliance with the CIEEM guidelines (CIEEM 2018) which are the industry standard and considers the factors described below.

Ornithological Zone of Influence

7.5.27 The Ornithological Zone of Influence (OZoI) is defined as the area within which there may be ornithological features subject to effects from the Proposed Development. Such effects could be direct (e.g. habitat loss resulting from land-take or removal of a building occupied by breeding birds) or indirect (e.g. noise or visual disturbance causing a species to move out of the OZoI). The OZoI is determined through:

- review of the existing baseline conditions based on desk study results, field surveys and information supplied by consultees;
- identification of sensitivities of ornithological features, where known;
- the outline design of the Proposed Development and approach to construction; and
- through liaison with other technical specialists involved in the assessment, e.g. hydrologists and noise specialists.

7.5.28 In order to consider potential ornithological impacts to species at a wider geographical scale, and where reliable and robust data are available, consideration is made for each IOF at the Natural Heritage Zone (NHZ) level (i.e. NHZ2 – North Caithness and Orkney).

Temporal Scope

7.5.29 Likely impacts on ornithological features have been assessed in the context of how the predicted baseline conditions within the OZoI might change between the surveys and the start of construction.

Characterising Ornithological Impacts and Effects

7.5.30 In accordance with the CIEEM guidelines, the following definitions are used for the terms 'impact' and 'effect':

- Impact – Actions resulting in changes to an ornithological feature. For example, the construction activities of a development removing woodland; and
- Effect – Outcome to an ornithological feature from an impact. For example, the effects on a species population from loss of woodland.

7.5.31 In accordance with the CIEEM guidelines, when determining impacts on IOFs, reference is made to the following:

- Beneficial or adverse – i.e. whether the impact has a beneficial or adverse effect in terms of nature conservation objectives and policy;
- Magnitude – i.e. the size of an impact, in quantitative terms where possible;
- Extent – i.e. the area over which an impact occurs;
- Duration – i.e. the time for which an impact is expected to last;

- Timing and frequency – i.e. whether impacts occur during critical life stages or seasons; and
- Reversibility – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible.

7.5.32 Unless stated otherwise impacts assessed below are assumed to be adverse, reversible and last of the period of the phase of the development.

7.5.33 For the purposes of this assessment, the predicted impacts on an ornithological feature are categorised as 'no impact', 'barely perceptible', 'low', 'medium' or 'high', based on the definitions in Table 7.3.

Table 7.3 – Levels of impact

Level of impact	Definition
No impact	No detectable impacts on the ornithological resource, even in the immediate term.
Barely perceptible	Detectable impact but reversible within 12 months. Not expected to affect the conservation status of the nature conservation designation, habitat or species under consideration.
Low	Detectable impacts, and may be irreversible, but either of sufficiently small scale or of short-term duration to have no material impact on the conservation status of the nature conservation designation, habitat or species population.
Medium	Detectable impact on the status of the nature conservation designation, habitat or species population in the medium term but is reversible / replaceable given time, and not a threat to the long-term integrity of the feature.
High	Irreversible impact on the status of the nature conservation designation, habitat or species and likely to threaten the long-term integrity of the feature. Not reversible or replaceable. Will remain detectable in the medium and long-term.
The following definitions have been applied in respect to timescales: Immediate: Within approximately 12 months; Short term: Within approximately 1-5 years; Medium term: Within approximately 6-15 years; and Long term: More than 15 years.	

7.5.34 The magnitude of any impact on IOFs was categorised according to the criteria outlined in Table 7.3, which is based on a table presented in the CIEEM (2018) guidelines. The concept of integrity refers to coherence of ecological structure and function and includes both temporal and spatial considerations.

7.5.35 Both direct and indirect impacts are considered: direct ornithological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ornithological impacts are attributable to an action but affect ornithological resources through effects on an intermediary ecosystem, process or feature, e.g. fencing of a development site and subsequent lack of grazing may create suitable grassland for ground nesting birds.

7.5.36 The assessment is undertaken in relation to the baseline conditions that would be expected to occur if the Proposed Development were not to take place, and therefore may include possible predictions of future changes to baseline conditions, such as environmental trends and other completed or planned development. Both adverse and beneficial impacts are possible. It is important to appreciate that this approach is not a rigid framework for assessment and the assessment of impact categories is a matter of professional judgement.

Limitations to Assessment

7.5.37 The surveys were undertaken at appropriate times of year, under favourable survey conditions and with full access to the study area, though in order to prevent disturbance to breeding grey seals and then stormy weather conditions and covid-19 restrictions meant non-breeding season surveys were compressed into a smaller time period than planned. As such, no significant limitations were identified.

7.6 Baseline Conditions

Desk Study Results

Statutory Designated Sites

7.6.1 As summarised in Appendix 7.1 and displayed on Figure 7.2, three international, one proposed international and six national nature conservation designations occur within 10 km of the Proposed Development boundary.

7.6.2 The Calf of Eday SPA (also designated as a SSSI) lies 2.7 km north-east of the Proposed Development boundary and is designated for a seabird assemblage of international importance. The SSSI is additionally designated for its breeding population of cormorant (*Phalacrocorax carbo*).

7.6.3 The North Orkney proposed SPA (pSPA) lies 5.1 km south of the Proposed Development boundary with the primary reason for the proposed designation including breeding red-throated diver, non-breeding great northern diver (*Gavia immer*) and non-breeding slavonian grebe (*Podiceps auritus*). The numbers of migratory/non-breeding species are another primary reason for the proposed designation which include common eider (*Somateria mollissima*), shag, long-tailed duck (*Clangula hyemalis*), red-breasted merganser (*Mergus serrator*); and velvet scoter (*Melanitta fusca*). Following the precautionary principle, as a proposed designation (i.e. pSPA) this site is considered to be of International ornithological importance.

7.6.4 Rousay SPA (also designated as a SSSI) lies 6.1 km south-west of the Proposed Development boundary and is designated for a seabird assemblage of international importance as well as its breeding Arctic tern population. The SSSI is additionally designated for its breeding guillemot (*Uria aalge*) and kittiwake (*Rissa tridactyla*).

7.6.5 West of Westray SPA lies 9.8 km north-west of the Proposed Development boundary and is designated for a seabird assemblage of international importance as well as breeding populations of Arctic tern (*Stercorarius parasiticus*) and guillemot.

7.6.6 Doomy and Whitemaw Hill SSSI on Eday lies 2.5 km south-east of the Proposed Development boundary and is designated for breeding whimbrel (*Numenius phaeopus*) and Arctic skua. Mill Loch SSSI, also on Eday, lies 2.5 km east of the Proposed Development boundary of the site and is designated for its breeding red-throated diver (*Gavia stellata*).

Non-statutory Nature Conservation Designations

7.6.7 Two Local Nature Conservation Sites (LNCS) are located within 2 km of the Proposed Development boundary. At c.1.3 km east and on the west of Eday, Braehead is designated for nationally important upland heath, blanket bog and oligotrophic and dystrophic lake habitats (avian interests include red-throated diver and breeding waders). Resting Hill LNCS is c.1.7 km east of the Proposed Development boundary and adjacent to Braehead LNCS; it is designated for nationally important upland heath and blanket bog habitats (avian interests include Arctic skua, curlew, lapwing, snipe, skylark and twite) (OIC, 2017b). The coast of Faray and Holm of Faray are also part of an RSPB Important Bird Area (IBA).

7.6.8 In addition, the Onziebust RSPB reserve is located 7.2 km south-west of the Proposed Development boundary and is designated for its breeding corncrake (*Crex crex*), curlew (*Numenius arquata*), lapwing (*Vanellus vanellus*) and redshank (*Tringa totanus*).

JNCC seabird data

7.6.9 A total of 13 breeding species have been recorded on Faray including: Arctic skua, Arctic tern, black-headed gull (Choroicocephalus ridibundus), common gull (Larus canus), cormorant, fulmar, great black-backed gull (Larus marinus), herring gull (Larus argentatus), shag, storm petrel, lesser black-backed gull (Larus fuscus), great skua and black guillemot.

Orkney RSG data

7.6.10 No historical records of Schedule 1 breeding species, such as hen harrier, merlin or peregrine, were recorded within 2 km of the site in 2018 and 2019.

Field Survey Results and Receptor Evaluation

7.6.11 Full details of the field survey results are provided in Appendix 7.1 with a summary of relevant results used to inform the assessment of likely ornithological impacts provided below. Details of flight lines of target species are presented in Appendix 7.1 with details presented on Figures 7.3 to 7.14.

Waterfowl and Divers

Whooper Swan

7.6.12 Whooper swan (Cygnus cygnus) were recorded on a single occasion when two birds flew over the site on 19th March 2020. The fact that the observation was a single record indicates that the importance of the site for this species is Less than Local.

Greylag Goose

7.6.13 Greylag goose (*Anser anser*) were registered frequently during VP surveys between April 2019 and March 2020. A total of 42 flightlines were recorded during the VP surveys with a combined total of 233 birds and maximum count of 47 birds forming one skein was recorded on 26th July 2019. The total flight time recorded was 2,309 seconds of which 797 seconds was recorded below 10 m, the remaining 1,512 seconds was recorded at potential collision height (PCH) (see Figure 7.13). A single breeding record for greylag goose was recorded in the centre of the site (see Figure 7.14).

7.6.14 The presence of greylag geese on Orkney is complicated by an increasing feral population which remain on Orkney throughout the year and which are considered in some areas to be a pest species (due to their impact on agricultural crops) and, as such, their numbers are controlled under special licence issued through NatureScot.

7.6.15 Greylag goose was recorded utilising the Proposed Development as a feeding and roosting site and also utilising the airspace above the Proposed Development for commuting, with a total of 42 flights recorded, of which 32 flights were recorded in the winter months. The presence of greylag goose and the moderate usage of the site as a stopover/staging roost to access areas of higher value within the wider region increase the biodiversity value of the site. Consequently, the presence of wintering greylag goose indicates that the importance of the site for this species is considered to be of **Local** ornithological value

Pink-Footed Goose

7.6.16 Pink-footed goose (*Anser brachyrhynchus*) were only recorded on a single occasion from VP surveys when a single bird flew over the site on 20th March 2020. A single bird was recorded on the sea during the first winter walkover in February 2020. The fact that the observations were of two records of a single bird indicate that the importance of the site for this species is considered to be **Less than Local**.

Red-Throated Diver

7.6.17 Red-throated diver were recorded on nine occasions from VP surveys, with six flights recorded over the island during the breeding season in a route towards Eday to the east with a further three flights

over the sea recorded in the non-breeding season (see Figure 7.14). No breeding records were record for this species with the nearest suitable habitat over 2.5 km east of the site on Eday.

7.6.18 Red-throated diver is a Schedule 1, Annex 1, BoCC Red Listed, SBL and Orkney LBAP species, as well as considered to be a species at risk from wind farm developments (SNH, 2006) and is legally protected accordingly. Red-throated diver are a qualifying species of the North Orkney Proposed SPA which is located 5.1 km south of the site.

7.6.19 The fact that the site is being occasionally used by this species in small numbers means that it is considered to be of **Local** ornithological value.

Other Waterfowl and Divers

7.6.20 Eider, red-breasted merganser, long-tailed duck and great-northern diver, teal (*Anas crecca*) and wigeon (*Anas penelope*) were all recorded in small numbers in the sea around the site during the winter walkover survey. Of these species long-tailed duck, eider and great northern diver are qualifying species of the North Orkney pSPA which is located 5.1 km south of the site.

7.6.21 As these species are sea ducks or non-breeding divers, it is to be expected that they weren't recorded within the site boundary, however their presence in the sea directly adjacent to the site (during the winter months) does increase the biodiversity value of the local area., Given the pSPA is over 5 km from the site and the fact they were recorded in such low numbers, indicates that the importance of the site for other waterfowl and divers is considered to be of **Less than local** ornithological value.

Raptors

7.6.22 Three species of scarce raptors were recorded during surveys: hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*) and peregrine (*Falco peregrinus*). Two secondary species of raptor, kestrel (*Falco tinnunculus*) and sparrowhawk (*Accipter nisus*), were also recorded.

Hen Harrier

7.6.23 Seven flights of individual hen harrier were registered from VP surveys. The seven flights were recorded between 27th August 2019 and 20th March 2020, out with the breeding season for this species (see Figure 7.3). The total flight time recorded was 456 seconds of which just 65 seconds was recorded at PCH. The breeding bird surveys and desk study found no evidence of breeding activity within the Survey Area for this species.

7.6.24 In addition to being an Annex 1 and Schedule 1 listed species, hen harrier are also listed on the SBL and are BoCC Red list as well as considered to be a species at risk from wind farm developments (SNH, 2018b). As such, hen harrier receive protection at both an international and national level.

7.6.25 The low level of flight activity and the lack of breeding records within the Survey Area indicate that the birds were passing over the site to more suitable adjacent feeding grounds on Eday and Westray. The site comprises heavily grazed grassland fields which do not provide optimal foraging or any suitable breeding habitat for hen harrier and the level of activity within the airspace over the site (i.e. flight time recorded at PCH) is insufficient to allow a valid assessment of collision risk to be made. Given the suite of surveys completed throughout the year and the limited activity recorded by hen harrier, the Proposed Development site is not considered to support breeding hen harrier and the site is considered to be only occasionally used by this species.

7.6.26 Therefore, despite the conservation status of hen harrier, the importance of the site for this species is considered to be **Less than Local**.

Merlin

7.6.27 Four flights of individual merlin were recorded on March 19th and March 20th during the VP surveys and presumably the same bird was recorded on the third winter walkover conducted on March 21st. The total flight time was 92 seconds, all of which was recorded below PCH (see Figure 7.3).

7.6.28 The breeding bird walkover surveys and desk study found no evidence of merlin breeding activity within the Survey Area for this species.

7.6.29 In addition to being Annex 1 and Schedule 1 listed species, merlin are also listed on the SBL and are BoCC Red list as well as considered to be a species at risk from wind farm developments (SNH, 2018b). As such, merlin receive protection at both an international and national level, accordingly.

7.6.30 The low level of flight activity and the lack of breeding records within the site indicate that the record of a single bird is it using the site to forage during the non-breeding season on an occasional basis. The habitats within the site do not provide optimal foraging or suitable breeding habitat for merlin and the level of activity within the airspace over the site is insufficient to allow a valid assessment of collision risk to be made. Given the suite of surveys completed throughout the year and the limited activity recorded by merlin, the Proposed Development site is not considered to support breeding merlin and is only occasionally used by this species.

7.6.31 Therefore, despite the international status of merlin, the importance of the site for this species is considered to be **Less than Local**.

Peregrine

7.6.32 Three flights of individual peregrine were recorded in March during the VP surveys with the flight time totalling 479 seconds of which 469 was recorded at PCH (see Figure 7.3).

7.6.33 The breeding bird walkover surveys and desk study found no evidence of breeding activity within the Survey Area for this species.

7.6.34 In addition to being Annex 1 and Schedule 1 listed species, peregrine are also listed on the SBL and are BoCC Red list and as such, peregrine receive protection at both an international and national level, accordingly.

7.6.35 The low level of flight activity and the lack of breeding records within the site indicate that the birds were passing over the site to adjacent feeding grounds. The presence of a high number of fulmar and the relatively low height of the cliffs on Faray mean that the habitats within the site do not provide optimal breeding habitat for peregrine and the level of activity within the airspace over the site is insufficient to allow a valid assessment of collision risk to be made. Given the suite of surveys completed throughout the year and the limited activity recorded by peregrine, the Proposed Development site is not considered to support breeding peregrine and is only occasionally used by this species.

7.6.36 Therefore, despite the international status of peregrine, the importance of the site for this species is considered to be **Less than Local**.

Common Raptors and Raven

Kestrel, sparrowhawk and raven

7.6.37 A single record of an individual kestrel and five records of sparrowhawk were recorded during the VP surveys. No evidence of breeding was noted for kestrel or sparrowhawk was recorded in the site, but a possible kestrel breeding attempt was recorded on the edge of the 2 km survey buffer during 2018 from the desk study (i.e. located off the island of Faray). Raven (*Corvus corax*) was commonly recorded within the site during both the VP surveys and the breeding bird survey. A single record of breeding raven was on cliffs in the site during breeding bird surveys. The fact that the observations were so infrequent means that the importance of the site for these three species is considered to be **Less than Local**.

Waders

Curlew

7.6.38 Curlew (*Numenius arquata*) were regularly recorded within the site between April 2019 and March 2020. A total of 24 flights were recorded during VP surveys, with a maximum number of four individuals recorded during a VP survey on 27th August (see Figure 7.4). No breeding territories were

identified within the Survey Area following the breeding bird survey. Small numbers of curlew were also recorded during winter walkover surveys with between eight and ten birds noted on each survey visit.

7.6.39 Curlew is BoCC red-listed, as well as an SBL and Orkney LBAP species and considered to be a species at risk from wind farm developments (SNH, 2018b), as a result of its declining population. The fact that the site is being regularly used by this species in small numbers means that it is considered to be of **Local** area ornithological value.

Dunlin

7.6.40 Dunlin (*Calidris alpina*) are an SBL and amber listed species, as well as a local priority species on the Orkney LBAP and were recorded once during the VP surveys. Dunlin were not recorded as a breeding species on the island. The limited and infrequent observations for this species indicate that the importance of the site for this species is considered to be **Less than Local**.

Golden Plover

7.6.41 Golden plover (*Pluvialis apricaria*) were recorded within the site on 21 occasions during VP surveys, with a total of 309 individuals registered. A total of three (one probable and two possible) golden plover breeding territories were recorded within the site boundary (Figure 7.5), which represents 0.2 % of the estimated NHZ2 Orkney and North Caithness (ONC) population (1,474 pairs) (Wilson *et al.*, 2015). Golden plover was also recorded in low numbers on the island top during each of the wintering bird survey visits.

7.6.42 Golden plover is an Annex 1 species and is legally protected accordingly. Golden plover is also an SBL and Orkney LBAP species as well as being considered to be a species at risk from wind farm developments (SNH, 2018b). The presence of breeding golden plover and the fact that the Proposed Development site is being used by golden plover in small numbers as a winter roost indicate that the importance of the site for this species is considered to be of **Local** ornithological value.

Lapwing

7.6.43 A total of 106 flights of lapwing were recorded during the VP surveys with a maximum number of 62 birds recorded during a single VP survey on 1st September 2019. Eleven potential lapwing territories (eight possible and three probable) were recorded within the Survey Area following the breeding bird walkover survey (see Figure 7.6), which represents 0.22 % of the estimated ONC population (estimated total of 5,000 pairs, Tait (2012)). In addition, low numbers were recorded during each visit of the winter walkover survey peaking at 12 on the first visit on 26th February 2020.

7.6.44 Lapwing are a BoCC Red List, SBL and Orkney LBAP species and numbers of this species are rapidly declining across Scotland and the UK as a whole and as such are considered to be a species of conservation concern. The presence of breeding lapwing and the fact that the Proposed Development site is being regularly used by lapwing, the importance of the site is considered to be of **Local** ornithological value for this species.

Oystercatcher

7.6.45 Oystercatcher (*Haematopus ostralegus*) were regularly recorded within the site between April 2019 and March 2020. A total of 47 flights were recorded during VP surveys, with a maximum number of nine individuals recorded on 25th July 2019. A total of 31 potential breeding territories (17 possible and 14 probable) were defined within the Survey Area, following the breeding bird survey (See Figure 7.7). Thirty-one breeding territories represents 0.31 % of the estimated ONC population (estimated at 10,000 pairs, Tait (2012)).

7.6.46 Oystercatcher are a BoCC Amber List and Orkney LBAP species. Due to the presence of multiple breeding territories, and the fact that the Proposed Development site is being regularly used by oystercatcher, the importance of the site is considered to be of **Local** ornithological value for this species.

Purple Sandpiper

7.6.47 Purple sandpiper (Calidris maritima) were recorded during all three visits of the winter walkover surveys with a peak count of 25 on March 21st 2020. The fact that the observations were so infrequent means that the importance of the site for this species is considered to be **Less than Local**.

Redshank

7.6.48 Redshank (*Tringa totanus*) was recorded utilising the site for breeding and foraging and also utilising the airspace above the site for commuting, with twelve flights totalling 15 individuals recorded throughout the VP survey period (see Figure 7.8). In addition, five (two possible and three probable) redshank breeding territories were recorded within the Survey Area. Redshank is BoCC amber listed as a result of its declining population. The presence of breeding redshank and the fact that redshank use the site and the airspace over the site is considered to increase the biodiversity at a local level the importance of the site is considered to be of **Local** ornithological value for this species.

Ringed Plover

7.6.49 Ringed plover (*Charadrius hiaticula*) was recorded utilising the site for breeding, foraging and also utilising the airspace above the site for commuting, with two flights totalling seven individuals recorded throughout the VP survey period, in addition three possible ringed plover breeding territories were recorded within the Survey Area (see Figure 7.8). Ringed plover is BoCC red listed as a result of its declining population. The presence of breeding ringed plover is considered to increase the biodiversity at a local level and therefore the importance of the site is considered to be of **Local** ornithological value for this species.

Snipe

7.6.50 Snipe (*Gallinago gallinago*) was recorded utilising the site for breeding and foraging as well as passing across the site, with ten flights totalling 15 individuals recorded throughout the VP survey period (see Figure 7.8). In addition, ten (eight possible and two probable) snipe breeding territories were recorded within the Survey Area, which represents 0.3 % of the estimated ONC population (3,326 pairs) (Wilson *et al.*, 2015) (see Figure 7.8). Snipe is an Orkney LBAP and BoCC amber-listed species as a result of its declining population. The presence of breeding snipe is considered to increase the biodiversity at a local level and therefore the importance of the site isconsidered to be of **Local** ornithological value for this species.

Turnstone

7.6.51 Turnstone (*Arenaria interpres*) were recorded four times from VP surveys and were not recorded as a breeding species on the island. Turnstone were recorded during all three visits of the winter walkover surveys with a peak count of 40 birds registered on February 26th 2020. The fact that the observations were so infrequent means that the importance of the site for this species is likely to be **Less than Local**.

Seabirds, Skuas and Gulls

Arctic skua

7.6.52 Arctic skua were recorded once from VP surveys and were not recorded as a breeding species within the study area. The fact that the observations were so infrequent means that the importance of the site for this species is likely to be **Less than Local**.

Arctic tern

7.6.53 Arctic tern was recorded on three occasions during VP surveys in the breeding season and three small colonies, totalling 15 incubating individuals, were noted with thirteen on the beach in the south of the site during the breeding bird walkover surveys (see Figure 7.14).

7.6.54 Arctic tern is an Annex 1 species and is legally protected accordingly. Arctic tern is also an SBL and Orkney LBAP species. The presence of breeding Arctic tern is considered to increase the biodiversity

at a local level and therefore the importance of the site is considered to be of **Local** Ornithological Value for this species.

Black guillemot

7.6.55 Black guillemot were not recorded during VP surveys however a full island survey registered black guillemot breeding around much of the island edges with a maximum count of 299 adults birds associated with the colony recorded within 300 m of the coastline on 30th April 2019.

7.6.56 Black guillemot is an Orkney LBAP and BoCC amber listed species as a result of its declining population. Black guillemot are a relatively common and widespread breeding species on Scotland's coasts and 299 breeding adults represents an estimated 0.8 % of the Scottish breeding population, with an estimated 18,750 breeding pairs in Scotland (Forester *et al.,* 2012). Forester *et al,* (2012) also state that areas of the highest densities of breeding black guillemot in Scotland include Holm of Papa Westray which lies approximately 15 km north of Faray.

7.6.57 The presence of black guillemot is considered to improve the biodiversity at a local level and is therefore the site is considered to be of **Local** ornithological value for this species.

Fulmar

7.6.58 Fulmar (*Fulmaris glacialis*) were recorded frequently during VP surveys and a full island survey recorded fulmar breeding around much of the island edges with a total of 472 adults on nests (AON's) recorded, of which 50 were recorded on Holm of Faray, during the cliff survey on 28th June 2019 (Figure 7.10). Fulmar is an Orkney LBAP species. Fulmar are a common and widespread breeding species on Scotland's coasts and 472 AON's represents 0.54% of the estimated Orkney breeding population with an estimated 88,560 AON's in Orkney in 1984/85 (Grey, 2002) and 0.1% of the estimated 486,000 AON's in Scotland (Forester *et al.,* 2012).

7.6.59 The presence of fulmar is considered to improve the biodiversity at a site level, although as they form only a small proportion of the national breeding population the site is considered to be of **Less than Local** ornithological value for the purposes of this assessment.

Great skua

7.6.60 Great skua were regularly recorded within the site between April 2019 and September 2019. A total of 26 flights were recorded during VP surveys, all of which consisted of individual birds. A single potential breeding territory was also defined within the Survey Area following the breeding bird survey (See Figure 7.14). One breeding territory represents 0.05 % of the estimated ONC population of 1,868 pairs (Wilson *et al.*, 2015).

7.6.61 Great skua are a BoCC Amber List and Orkney LBAP species. Due to the presence a breeding territory, and the fact that the Proposed Development site is being regularly used by great skua during the breeding season, the site is considered to be of **Local** ornithological value for this species.

Gulls

7.6.62 Common gull (*Larus canus*), great black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*) and lesser black-backed gull (*Larus fuscus*) were all commonly recorded during VP surveys and a single Iceland gull (*Larus glaucoides*) was also noted. Three species of gull were noted as breeding within the study area (See Figure 7.17), with common gull nesting predominantly on the island top (17 AON's). A total of great black-backed gull 32 AON's were recorded during breeding bird surveys, of which 18 were on the cliffs and 14 on the island top. A total of 96 herring gull AON's were recorded, 91 of which were located on the island top and five on cliffs.

7.6.63 An estimated 11,208 pair of common gulls (Tait, 2012), 1,712 pairs of great black-backed gulls and 3,455 pairs of herring gulls (Wilson et al., 2015) breed on Orkney meaning the colonies at the site consist of 0.18 %, 1.87 % and 2.78 % of the Orkney population, respectively. Scottish population estimates, taken from Birds of Scotland (Forrester et al., 2007), are 48,100 common gull, 14,800 great black-backed gull and 72, 100 herring gull meaning the Faray gull AON's constitute 0.04 %, 0.22 % and 0.13 %, respectively, of the breeding Scottish population.

7.6.64 All the four regularly recorded gull species are of conservation concern as a result of their inclusion in the BoCC red and amber lists. Flights of gulls through the Survey Area were commonly recorded from VP surveys and the site was observed to be used for both breeding common, great black-backed and herring gulls. Due to the presence of three species of breeding gull within the Survey Area, and one further gull species utilising the site, it is considered that their presence increases the biodiversity resource of the site and wider environs and therefore the site is considered to be of **Local** ornithological value for these species.

Shag

7.6.65 Shag were infrequently recorded during VP surveys however a full island survey recorded shags breeding around much of the island edges with a total of 162 AON's birds recorded on 30th May 2019 (See Figure 7.9).

7.6.66 Shag is an Orkney LBAP and BoCC red-listed species as a result of its declining population.

7.6.67 Shag are a relatively common and widespread breeding species on Scotland's coasts and 162 breeding pairs represents 0.5 % - 0.8 % of the estimated breeding species with an estimated 21,500-30,000 breeding pairs in Scotland (Forester *et al.,* 2012). The presence of shag is considered to improve the biodiversity at a local level and the site is therefore considered to be of **Local** ornithological value for this species.

Storm Petrel

7.6.68 Storm petrel were not recorded during diurnal VP surveys, which is as expected as they only return to and leave breeding grounds during the night. The targeted storm petrel surveys identified an estimated 91/87 (2019/2020 survey results) breeding locations throughout the island. The majority of the nest locations (>50 %) were found to be concentrated in the boulders making up both collapsed sections and standing sections of the dyke along the north of the island (see Confidential Figure 7.11).

7.6.69 Dedicated night-time surveys recorded low levels of flight activity over the island top, with returning birds flying low and directly to nest locations in order to avoid detection by predators (such as gulls and skuas). For further details of storm petrel survey methodology and survey results please refer to Appendix 7.3.

7.6.70 Storm petrel is an Annex 1 species and is legally protected accordingly. Storm petrel is also an SBL and Orkney LBAP species, as well as being BoCC Amber listed. A total of 91 Adults On Site (AOS) comprises 4.87 % of the estimated Orkney total (1,870) and 0.42 % of the estimated Scottish total AOS (21,730) as of survey 1999-2002 (Mitchel et al., 2004).

7.6.71 Given the high conservation value of storm petrel (i.e. it's Annex 1 species status), and its presence of approximately 5 % of Orkney's breeding population storm petrel the site is therefore considered to be of **Council** ornithological value for this species.

Other passerine species

7.6.72 A small number of species of conservation concern were recorded during the breeding bird walkover survey and included three BoCC red-listed species: skylark (*Alauda arvensis*), linnet (*Carduelis cannabina*) and twite (*Linaria flavirostris*). A further two BoCC amber-listed species were also recorded: meadow pipit (*Anthus petrosus*) and swallow (*Hirundo rustica*).

7.6.73 These species are typical of these habitats within Orkney. Although their presence does enrich the biodiversity of the local area, the site is considered to be of **Less than local** ornithological value for these common passerine species.

Likely future baseline without development

7.6.74 The forward baseline at the site in the case that the Proposed Development is not built is assumed to be very similar to the conditions outline in the section above. This assumes that there will be no change in the current land use of the island, being a sheep farm and being uninhabited and undisturbed throughout much of the year. The majority of ornithological species on the island rely

on the availability of food from within surrounding seas and beaches as well as grassland and cliffs to nest in or on. It is considered unlikely that there will be any significant change in the baseline conditions on the island in the coming years should the land use remain in its current state.

Summary of Evaluation of Recorded Features

Table 7.4 - Summary of Evaluation of Ornithological Features

Feature	Summary	Level of Importance
Designated Sites		
Doomy and Whitemaw Hill SSSI	Located 2.5 km south south-east of the Proposed Development boundary. Designated for breeding whimbrel and Arctic skua.	National
Mill Loch SSSI	Located 2.6 km east of the Proposed Development boundary. Designated for breeding red-throated diver.	National
Calf of Eday SPA	Located 2.7 km north-east of the Proposed Development boundary. Designated for a seabird assemblage of international importance.	International
Calf of Eday SSSI	Located 2.7 km north-east of the Proposed Development boundary. Designated for breeding cormorant.	National
North Orkney pSPA	Located 5 km south of the Proposed Development boundary. Annex I species are a primary reason for the proposed designation, including; breeding red-throated diver, non-breeding great northern diver and non-breeding Slavonian grebe. The numbers of migratory/non-breeding species are another primary reason for the proposed designation, including: non-breeding common eider, shag, long-tailed duck, red-breasted merganser and velvet scoter.	International
Rousay SPA	Located 6.1 km west south-west of the Proposed Development boundary. Designated for a seabird assemblage of international importance and breeding Arctic tern.	International
Rousay SSSI	Located 8.2 km west south-west of the Proposed Development boundary. Designated for a moorland breeding bird assemblage and breeding Arctic tern, Arctic skua and kittiwake.	National
West Westray SPA	Located 9.8 km west north-west of the Proposed Development boundary. Designated for a seabird assemblage of international importance and breeding Arctic tern and guillemot.	International

Feature		Summary	Level of Importance
Onziebust RSPB Reserve		Located 7.2 km south-west of the Proposed Development boundary. Designated for breeding corncrake, curlew, lapwing and redshank.	Council
Local Nature Conservation Sites / RSPB IBA		Two LNCS site within 2 km of the Proposed Development boundary and IBA which overlaps the site.	Council
Waterfowl and Divers			
Whooper Swan		Annex 1, Schedule 1, SBL, BoCC Amber and Orkney LBAP listed species. Recorded on one occasion in winter months.	Less than local
Greylag Goose		Frequently recorded in winter months, likely some naturalised birds. BoCC Amber listed species.	Local
Pink-footed Goose		Infrequently recorded in winter months in Proposed Development. BoCC amber listed.	Less than local
Red-throated diver		Infrequently recorded, not recorded as a breeding species. Annex 1, Schedule 1, BoCC Amber, Orkney LBAP listed and SBL species.	Local
Other Waterfowl and Divers	Eider	Recorded in sea directly adjacent to the site in winter months, possible breeding species.	Less than Local
	Great-northern diver	Recorded in sea directly adjacent to the site in winter months.	Less than Local
	Long-tailed duck	Recorded in sea directly adjacent to the site in winter months.	Less than Local
	Red-breasted merganser	Recorded in sea directly adjacent to the site in winter months.	Less than Local
	Teal	Frequently recorded, BoCC Amber listed species.	Less than Local
	Wigeon	Frequently recorded, BoCC Amber listed species.	Less than Local
Raptors			
Hen harrier		Recorded seven times in non-breeding season; Not recorded breeding within 2km of Proposed Development, Annex 1, Schedule 1, BoCC Amber and Orkney LBAP listed and SBL species.	Less than local
Merlin		Recorded four times on two days in March; No historic breeding within 2km of Proposed Development. Annex	Less than local

Feature	Summary	Level of Importance
	1, Schedule 1, BoCC Amber, Orkney LBAP listed and SBL species.	
Peregrine	Recorded three times. Schedule 1, Annex 1 and an SPL species.	Less than local
Common Raptors and Raven		
Raven	Commonly recorded, breeding on site.	Less than local
Kestrel	Infrequently recorded, BoCC Amber and Orkney LBAP listed species.	Less than local
Sparrowhawk	Infrequently recorded, BoCC Amber and Orkney LBAP listed species.	Less than local
Waders		
Curlew	Frequently recorded but not breeding in Proposed Development. SBL / BoCC Red Orkney LBAP listed. Designated species for RSPB site within 10 km of the site.	Local
Dunlin	Infrequently recorded during surveys. No breeding behaviour was observed for this species during the breeding bird survey. SBL, BoCC Amber and Orkney LBAP listed.	Less than local
Lapwing	Frequently recorded and breeding in Proposed Development. SBL / BoCC Red Orkney LBAP listed. Designated species for RSPB site within 10 km of the site.	Local
Oystercatcher	Frequently recorded and breeding in Proposed Development. BoCC Amber, Orkney LBAP listed.	Local
Golden plover	Frequently recorded, possible breeding in small numbers Proposed Development, Annex 1 species, BoCC Amber, Orkney LBAP listed.	Local
Redshank	Infrequently recorded and breeding in Proposed Development. BoCC Amber and and Orkney LBAP listed species. Designated species for RSPB site within 10 km of the site.	Local
Ringed plover	Breeding records in Proposed Development. BoCC Red and Orkney LBAP listed.	Local
Sanderling	BoCC Amber and Orkney LBAP listed species. Infrequently recorded, winter visitor.	Less than local

Feature	Summary	Level of Importance
Snipe	Infrequently recorded breeding records in Proposed Development. BoCC Amber and Orkney LBAP listed species.	Local
Turnstone	Infrequently recorded, winter visitor. Orkney LBAP listed species.	Less than local
Seabirds, Skuas and Gulls		
Arctic tern	Recorded breeding in Proposed Development; Annex 1, BoCC Red, Orkney LBAP listed and SBL species.	Local
Arctic skua	Infrequently recorded, BoCC Red and Orkney LBAP list species.	Less than local
Great skua	Frequently recorded in breeding season, probable breeding species, BoCC Amber list species.	Local
Common gull	Commonly recorded, Breeding records in Proposed Development BoCC Amber and Orkney LBAP listed species.	Local
Great black-backed gull	Commonly recorded, Breeding records in Proposed Development BoCC Amber, Orkney LBAP and SPL listed species.	Local
Herring gull	Commonly recorded, Breeding records in Proposed Development BoCC Red, Orkney LBAP and SPL listed species.	Local
Black Guillemot	Infrequently recorded, abundant breeding species, BoCC Amber and Orkney LBAP list species.	Local
Fulmar	Frequently recorded, common breeding species, BoCC Amber and Orkney LBAP list species.	Less than local
Shag	Commonly recorded, abundant breeding species, BoCC Red and Orkney LBAP list species.	Local
Storm Petrel	Recorded breeding throughout structures in Proposed Development; Annex 1, BoCC Amber, Orkney LBAP listed and SBL species.	Council
Other Passerine Species		
Five passerine species typically found in this habitat-type in Orkney	Commonly recorded species typical of the habitat, BoCC red and amber listed, Orkney LBAP and SBL species.	Less than local

7.7 Receptors Brought Forward for Assessment

7.7.1 As noted in Section 7.4, under Evaluation Methods for Ornithological Features, ornithological features of local and higher value are considered IOFs. Due to a range of factors, some of these IOFs can be scoped-out of further consideration:

- Designated sites:
  - North Orkney pSPA, Rousay SPA and SSSI and West Westray SPA are located between 5 km - 10 km from the Proposed Development. These distances are considered beyond potential connectivity given the qualifying features supported therein and not to be subject to impacts resulting from the Proposed Development and, therefore, not considered any further in this assessment.
  - Doomy and Whitemaw Hill SSSI is over 2.5 km away and designated for species that were only very infrequently recorded on the site, therein and not to be subject to impacts resulting from the Proposed Development and, therefore, not considered any further in this assessment.
  - Calf of Eday SPA and SSSI is located over 2.5 km away and designated for it's seabird assemblage (SPA qualifying feature) and breeding cormorant (SSSI qualifying feature) which were only recorded during VP surveys outside of the non-breeding season. Given the distance from the site and the limited records and seasonality of cormorant across the site, the Calf of Eday is considered beyond connective distance and, therefore, not considered any further in this assessment.
  - Onziebust RSPB Reserve is over 7 km from the Proposed Development. This distance is considered beyond potential connectivity given the qualifying features supported therein and not to be subject to impacts resulting from the Proposed Development and, therefore, not considered any further in this assessment.
  - Braehead and Resting Hill Local Nature Conservation Sites are between 1.3 km to 2 km from the Proposed Development and on a different island and given the distance means it is unlikely these local sites will be impacted by the Proposed Development.
- Species (scoped out of further assessment due to level of importance as described above and summarised in Table 7.4):
  - whooper swan;
  - pink-footed goose;
  - other waterfowl and divers;
  - hen harrier;
  - merlin;
  - peregrine;
  - common raptors and raven;
  - dunlin;
  - sanderling;
  - turnstone;
  - Arctic skua;

- fulmar; and
- other passerine species.

7.7.2 The remaining IOFs of Local value or higher, and therefore taken forward for further assessment, include:

- designated sites:
  - Mill Loch SSSI.
- Species/Species Groups:
  - greylag goose;
  - red-throated diver;
  - waders
    - curlew;
    - lapwing;
    - oystercatcher;
    - golden plover;
    - redshank;
    - ringed plover;
    - snipe;
  - arctic tern;
  - great skua;
  - black guillemot;
  - shag;
  - gull species (i.e. common gull, great black-backed gull and herring gull); and
  - storm petrel.

7.8 Identification and Evaluation of Key Impacts

Standard Mitigation

7.8.1 As previously noted, following CIEEM guidance (CIEEM, 2018), the assessment process assumes the application of standard mitigation measures. This section of the assessment details the mitigation measures that are recommended to ameliorate identified effects associated with the construction and operational phase of the Proposed Development. These measures are aimed to prevent, reduce or offset any likely significant effects of the Proposed Development on identified ornithological receptors. This approach is in accordance with best practice guidance and UK, Scottish and Local Government environmental, planning and sustainability policies.

7.8.2 The principles and objectives for mitigation associated with the Proposed Development have been developed through an iterative process with the Applicant's design team and through discussion with NS and other stakeholders.

7.8.3 Mitigation includes best practice methods and principles applied to the Proposed Development as a whole (generic measures) as well as site specific mitigation measures applied to individual locations (specific measures).

7.8.4 All ornithological mitigation will be incorporated into a Construction Environmental Management Plan (CEMP). This CEMP, to be confirmed, will outline all required mitigation and provide details on timelines for undertaking mitigation for each identified ornithological receptor. This CEMP will also outline a timetable of actions and form part of the contract documents to ensure delivery of mitigation specified in this chapter. In addition, the CEMP would incorporate the provision of an Ecological Clerk of Works (ECoW) to oversee the implementation of recommended mitigation.

Generic/Embedded Mitigation

7.8.5 In the event of consent the generic mitigation measures that apply to all ornithological receptors across the Proposed Development, and which are considered as embedded in the site development proposals and therefore assumed to be the case for the purposes of assessing potential impacts, are outlined below:

- Prior to any construction of the Proposed Development, the Applicant will undertake a series of pre-construction ornithological targeted checks to update the baseline information reported in this chapter. The full scope and requirements of the pre-construction checks will be agreed with the Planning Authority and involve engaging a Suitably Qualified Ecologist (SQE). The aim of these checks would be to provide up to date information on possible new breeding attempts for key target species, such as Schedule 1 raptors, in order to finalise the mitigation proposals. This would be in addition to completing a final check prior to construction for protected species (see Chapter 8: Terrestrial Ecology and Chapter 16: Underwater Noise Assessment of this EIA Report) and would be discussed and agreed with NS.
- Further to or incorporated into the update surveys above, protection of breeding bird nests from damage and/or destruction during the breeding season will need to be ensured. Wherever possible, all vegetation clearance will occur outside the bird (and seal) breeding season (i.e. between end of December – March, inclusive), to ensure that no active nests are damaged or destroyed by the proposed works. If work is required after March 31st, the SQE will search areas of clearance in advance of works and buffer active nests as appropriate. This would include any areas of clearance and vegetation removal for access tracks, compounds or turbine bases due to the populations of ground nesting birds on and around the site.
- Removing vegetation from working areas outside the breeding season in December and January, would also reduce the attractiveness of those areas to breeding birds the following season, which means that birds are less likely to breed in those areas.
- Avoidance of unnecessary disturbance to habitats by minimising the extent of ground clearance and other construction practices as far as practicable.
- An ecological toolbox talk with supporting literature will be given to all site personnel as part of site induction on the potential presence of ornithological species and any measures that need to be undertaken should such species be discovered during construction activities. The toolbox talk will also include the requirement to report and log any bird casualties (including due to the met-mast) at the Proposed Development during construction and operation of the site.

7.8.6 As part of the Proposed Development proposals it will be necessary to develop and implement a Site Restoration Plan (SRP) as part of the CEMP to ensure the regeneration of those areas of habitat that have been temporarily lost through construction works.

7.8.7 In order to facilitate restoration, disturbed ground will be restored as soon as practicably possible using materials removed during the construction of access tracks, excavation of cable trenches and turbine foundations. To achieve this, any excavated soil will need to be stored in such a manner that is suitable to facilitate retention of the seed bank. This will aid site restoration and help conserve the pre-construction floristic interests at the site.

7.8.8 Additional, specific mitigation measures are discussed in Section 7.10.

7.9 Likely Effects

Description of the Proposed Development

7.9.1 As described in Chapter 3, the Proposed Development will consist of six wind turbines with a maximum blade tip height of up to 149.9 m. The specific turbine manufacturer and model has not yet been selected, as this will be subject to a pre-commencement tendering exercise and will be confirmed post-consent.

7.9.2 The proposed final locations of the turbines have been defined, in order to enable the EIA report to fully describe the Proposed Development for which permission is being sought. The British National Grid coordinates denoting where each of the turbines are proposed to be located are listed in Chapter 3 and shown on Figure 1.2.

7.9.3 The main elements of the Proposed Development which have the potential to impact on IOFs, both during construction and operation are:

- Landing facility works (landing jetty construction and slipway upgrade; see below);
- Track construction, including bridging/culverting of two drainage ditches, mobile plant traffic movements and potential for dust generation;
- Temporary borrow pit operations, including potential for dust generation;
- Met mast installation;
- Turbine foundation creation (including excavation, pile-driving of anchors, etc.);
- Crane pad and permanent hardstanding construction;
- Cable-laying and grid connection infrastructure (including substation);
- Temporary lay-down and site compound areas;
- Temporary materials storage (soils and turves);
- Site water management; and
- Site restoration (track batters, compounds, etc.).

Construction Impacts

7.9.4 The above activities have the potential to cause the following construction impacts to the IOFs identified for the site:

- Direct loss of habitat.
- Direct loss of foraging habitat and/or breeding habitat for protected species.
- Indirect loss of foraging habitats and/or breeding habitat for species, through displacement.
- Disturbance and displacement to habitats and species (including noise, vibration, pollution), due to track and turbine base construction, as well as turbine erection, heavy machinery, noise and human activity on the site. Disturbance of ground vegetation and ground-nesting birds may affect a 5 m zone around all infrastructure.

Operational Impacts

7.9.5 The potential operational impacts have been identified as:

- Habitat change (modification) over time (N.B. operation phase drying of peaty or marshy substrates may affect up to 5m around cut track).
- Direct and indirect loss of foraging or breeding habitat due to displacement or avoidance.

- Mortality resulting from collision with turbines.
- Cumulative impacts of the Proposed Development in the context of other nearby wind farms (operational, consented and in planning).

Construction Effects

Designated Sites

Mill Loch SSSI

7.9.6 Impacts on habitats within designated sites have been considered unlikely given their distances from the site (see Chapter 8: Terrestrial Ecology). In addition, with the designated site on a different island any significant residual hydrological effects are unlikely to occur (see Chapter 11: Geology, Peat, Hydrology and Hydrogeology). Impacts are, therefore limited to those affecting populations of species qualifying as features of the designated site, namely red-throated diver. Impacts on this qualifying species during construction and operation phases of the Proposed Development are provided in the species accounts below.

Waterfowl and Divers

Greylag goose

7.9.7 The Proposed Development site is considered to be of Local importance for greylag goose. Greylag goose utilise the site as a breeding, foraging and roosting location and utilise the airspace above the Proposed Development site for commuting flights. Construction would lead to temporary disturbance effect as a result of an increase in noise and vibration. Construction activities would also lead to the displacement of the single breeding pair as well as foraging and roosting birds.

7.9.8 There is a large amount of similar habitat for roosting and foraging geese on the other sections of the island and all the surrounding islands in the local area, in particular on Holm of Faray and Westray to the north and on Eday to the east of the Proposed Development, so the temporary displacement of geese is not considered significant.

7.9.9 The effects on greylag goose during construction are considered to be immediate and temporary and a **barely perceptible** adverse impact and therefore not significant.

Red-throated diver

7.9.10 The Proposed Development site is considered to be of local area importance for red-throated diver. Red-throated diver use the sea around the island for foraging all year round and were recorded utilising the airspace above the Proposed Development occasionally while flying over the island, but no breeding territories were recorded within the study area. The nearest breeding habitat is located over 2 km east on Eday.

7.9.11 Given the lack of suitable breeding habitat within disturbance distance, the overall effects on red-throated diver during construction are considered to be temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Waders

Curlew

7.9.12 The Proposed Development site is considered to be of local area importance for curlew. Curlew were recorded using the Survey Area for foraging but no breeding territories were recorded within the study area.

7.9.13 Although no breeding territories were recorded for curlew on the island it is considered a possibility they could breed there in small numbers in future years, so likely impacts on curlew during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat

loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.14 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.1-7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified, then appropriate mitigation measures to protect nest sites will be implemented.

7.9.15 The overall effects on curlew during construction are considered to be temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Lapwing

7.9.16 The Proposed Development site is considered to be of Local importance for lapwing. Lapwing were recorded using the Survey Area for breeding, foraging and roosting with a total of 11 territories recorded within the Survey Area. Of the 11 territories recorded within the Survey Area, one was recorded upon the Proposed Development infrastructure and a further one within 50 m.

7.9.17 Potential impacts on lapwing during construction include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed or abandoned. Paragraph 7.8.5 – 7.8.8 outlines the proposed construction mitigation measures in order to ensure nest sites would be protected from construction-related disturbance.

7.9.18 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.19 The overall effects on lapwing during construction are considered to be temporary and of **low** adverse impact and therefore not significant effects at the local area scale.

Golden plover

7.9.20 Golden plover were recorded as possibly breeding within the Survey Area in low numbers (assessed as having one probable and two possible territories). Golden plover were also recorded in small numbers using the site for foraging and roosting throughout the year. The site contains limited suitable breeding habitat for this species and it is likely birds recorded in April were likely using the site as a stopover point before heading to suitable breeding grounds. Given the presence of only one probable and two possible breeding territories for this species, as well as more favourable breeding habitat being located outwith the site boundary, displacement effects are unlikely to be greater than the Local level importance.

7.9.21 Likely impacts on golden plover during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.22 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.23 The overall effects on golden plover during construction are considered to be temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Oystercatcher

7.9.24 The Proposed Development site is considered to be of Local importance for oystercatcher. Oystercatcher were recorded using the Survey Area for breeding, foraging and roosting with a total of 31 territories recorded within the Survey Area. Of the 31 territories recorded within the Survey Area, three were recorded upon the Proposed Development infrastructure and a further three within 50 m.

7.9.25 Likely impacts on oystercatcher during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.26 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. In the lead up to and during the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.27 Although there is some potential for the displacement of oystercatcher breeding territories during construction within the breeding season, the overall effects on oystercatcher during the construction phase are considered to be temporary in nature and of **low** adverse impact and therefore not significant at the local area scale.

Redshank

7.9.28 The Proposed Development site is considered to be of Local importance for redshank. Redshank were recorded using the Survey Area for breeding, foraging and roosting with a total of five territories recorded within the Survey Area. Two of the five breeding attempts registered following the breeding bird survey were recorded within 50 m of the Proposed Development infrastructure.

7.9.29 Likely impacts on redshank during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.30 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.31 The overall effects on redshank during construction are considered to be temporary and of **low** adverse impact and therefore not significant at the local area scale.

Ringed Plover

7.9.32 The Proposed Development site is considered to be of Local importance for ringed plover. Ringed plover were recorded using the Survey Area for breeding, foraging and roosting with a total of three territories recorded within the Survey Area. One of the two breeding attempts was recorded within 50 m of the Proposed Development infrastructure.

7.9.33 Likely impacts on ringed plover during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.34 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation

outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.35 The overall effects on ringed plover during construction are considered to be temporary and of **low** adverse impact and therefore **not significant** at the local area scale.

Snipe

7.9.36 The Proposed Development site is considered to be of Local importance for snipe. Snipe were recorded using the Survey Area for breeding, foraging and roosting with a total of ten territories recorded within the Survey Area. Of the ten territories recorded within the site, one was located within Proposed Development infrastructure and a further five within 50 m.

7.9.37 Likely impacts on snipe during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.38 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.39 The overall effects on snipe during construction are considered to be temporary and of **low** adverse impact and therefore not significant at the local area scale.

Seabirds, Skuas and Gulls

Arctic tern

7.9.40 The Proposed Development site is considered to be of Local importance for Arctic tern. Arctic tern were recorded as breeding within the Survey Area with a colony of 14 in the south-west of site and a smaller colony on three nests and single nest on beaches in the west and north of the site. The breeding locations are located over 200 m from the nearest site infrastructure.

7.9.41 Likely impacts on Arctic tern during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.42 Potential disturbance may result in displacement from the areas of land clearance and a wider area adjacent to it. Additionally, if the disturbance occurs during the breeding season this may result in the abandonment of nests or breeding territories. However, pre-construction checks and the ECoW will identify active nesting locations during any works taking place in the breeding season and implement appropriate mitigation measures to protect any nest sites.

7.9.43 The overall effects on Arctic tern during construction are considered to be temporary and of **low** adverse impact and therefore not significant at the local area scale.

Black guillemot

7.9.44 The Proposed Development site is considered to be of Local importance for black guillemot. Black guillemot were recorded as breeding around the island edges with a maximum total of 299 adult birds recorded around the island during surveys. Black guillemot breeding in crevises and boulder fields at the bases of cliffs which are located away from all the site infrastructure.

7.9.45 The breeding locations of this species are away from all site infrastructure and as such are unlikely to be disturbed meaning during construction effects are considered to temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Shag

7.9.46 The Proposed Development site is considered to be of Local importance for shag. Shag were recorded as breeding within the Survey Area with 162 AON's recorded on the cliffs around the island edges. The breeding locations are located at the base of cliffs in caves and on ledges and away from all the site infrastructure.

7.9.47 The breeding locations of this species are away from all site infrastructure and as such are unlikely to be disturbed meaning during construction effects are considered to temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Great skua

7.9.48 Great skua were recorded as possibly breeding within the Survey Area in very low numbers (assessed as having one probable territory). Great skua were also recorded in small numbers using the site for foraging and roosting throughout the breeding season. Great skua prefer open heather moorland for breeding and there is little of this optimal breeding habitat for this species within the site. Adjacent islands Eday and Westray have larger expanses of heather moorland that provide great skua their preferred breeding habitat. The probable breeding attempt from 2019 was located on top of proposed infrastructure, but given it was the only breeding pair on the island and that there is similar grassland habitat elsewhere on the island it is considered likely that this pair will relocate away from the disturbed area. Given the presence of only one probable breeding territory for this species, as well as more similar breeding habitat which is located within the site boundary, displacement effects are unlikely to be greater than the Local level importance.

7.9.49 Likely impacts on great skua during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.50 Potential disturbance during construction may result in displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories, as a result of disturbance the standard mitigation outlined in paragraphs in 7.8.5 – 7.8.8, including the pre-construction checks and the appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified then appropriate mitigation measures to protect nest sites will be implemented.

7.9.51 The overall effects on great skua during construction are considered to be temporary and of **barely perceptible** adverse impact and therefore not significant at the local area scale.

Gull species

7.9.52 The Proposed Development site is considered to be of Local importance for gulls. Great black-backed gull, herring gull and common gull were recorded as breeding within the Survey Area with colonies of each of the species on the island top as well as single birds scattered along the cliff tops around the site. There are three herring gull and one great black-backed gull within 100 m of turbines and no common gull territories. All three gull species were recorded flying over and roosting on the site in small numbers.

7.9.53 Likely impacts on gulls during construction would include potential mortality as a result of construction activities, temporary disturbance as a result of soil stripping and increased noise and vibration and temporary habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.

7.9.54 Potential disturbance may result in displacement from the areas of land clearance and a wider area adjacent to it. Additionally, if the disturbance occurs during the breeding season this may result in the abandonment of nests or breeding territories. However, pre-construction checks and the ECoW will identify active nesting locations during any works taking place in the breeding season and implement appropriate mitigation measures to protect any nest sites. Roosting gulls may be displaced during the non-breeding season. There is a large amount of similar habitat for roosting

gulls in the local area, in particular west and east of the Proposed Development, so the temporary displacement of gulls from this roost site is not considered significant.

7.9.55 The overall effects on gulls during construction are considered to be temporary and of **low** adverse impact and therefore not significant at the local area scale.

Storm petrel

7.9.56 Storm petrel were confirmed as breeding within boulders, walls and stone structures across the site with 91 AOS in 2019 and 87 AOS in 2020 (Confidential Figure 7.11). Storm petrel were also recorded flying to and from nest sites within the breeding season during night-time. No records of storm petrel were registered flying during daylight hours.

7.9.57 Likely impacts on storm petrel during construction are likely restricted to temporary disturbance as a result of soil stripping and increased noise and vibration. Storm petrel nest in burrows within structures so it is therefore considered that there would be only limited possibility of mortality if construction activities are undertaken during the bird breeding season when nests and chicks may be destroyed.

7.9.58 Storm petrels are unlikely to be affected in flight during construction as they fly during the hours of darkness and only between May and September meaning any overlap with construction activities are unlikely. The most likely impact on storm petrels during construction is potential disturbance on nesting birds in particular during initial sitting and incubation in June and July when they are present on nests during daylight hours and have been noted to be sensitive to vibrational disturbance (Watson *et al,* 2014).

7.9.59 Disturbance during the development of onshore wind farms on storm petrel (and other similar species) is not well documented and no recommended disturbance stand-off distance was recorded within the recommended disturbance guidance by Ruddock and Whitfield, 2007. The only Schedule 1 species in this document that also nest within structures similar to the storm petrels within the site is barn owl (*Tyto alba*) which are given the recommended disturbance distance of between 50-100 m for construction activity. Using barn owl as an example it was decided that a minimum stand-off distance of 100 m for storm petrel would also be pragmatic.

7.9.60 During the site design process, particular attention has been used in order to avoid storm petrel breeding locations using a minimum 100 m disturbance buffer around all breeding locations from both 2019 and 2020 callback surveys. A single nest site recorded in 2020 was located in direct proximity to an access track and within 50 m of the main junction of tracks which splits to turbines east, west and north on the site and it was not considered possible to redesign the infrastructure so as to avoid this location. Attempts to relocate this nesting location are described as part of the proposed mitigation measures presented in Section 7.10 paragraphs 7.10.2 – 7.10.12. Potential disturbance may result in the abandonment of nests or breeding territories while adult birds are preparing for and undertaking incubation with just the aforementioned single nest recorded within 100 m of site infrastructure.

7.9.61 Storm petrels are highly vulnerable to predation being a ground nesting species with bird species such as gulls and skuas likely to predate both birds and eggs whenever the chance arises. Storm petrels are more vulnerable to predation by brown rats (*Rattus norvegicus*). Brown rats are considered to be pivotal to storm petrel breeding success to the point that the occurrence of breeding colonies in the northern isles of Scotland rely on the absence of brown rats (de Leon et al., 2006). The construction of Proposed Development will involve an increase in boat traffic landing on the island and with larger vessels used to carry turbines and other construction materials. As such, there is the possibility that, without biosecurity measures in place, construction traffic could inadvertently transport invasive and/or problematic species onto the island, such rats and mice, increasing the potential for predation of storm petrel and their nests. If species such as brown rat are inadvertently introduced onto the island then it would be possible to eradicate them, although this would be dependent on early detection.

7.9.62 The overall effects on storm petrel during construction are considered to be short-term and of **medium** adverse impact and therefore not significant at the regional area scale.

7.9.63 Please note that an integral part of the Proposed Development's operation on Faray is to support future populations of storm petrel through the enhancement and monitoring of the main breeding colony structure for future generations. Details of the enhancement measures proposed are presented in Section 7.10 paragraphs 7.10.2 – 7.10.12.

Operation Effects

7.9.64 Effects of land take on birds (i.e. decreased resource availability) are considered to be limited given the small percentage (<5 %) of the site that will be occupied by the footprint of the Proposed Development (8.1 ha). There is the potential for a component of the Proposed Development infrastructure to be sited on, or close to, a specific type and area of habitat used by one or more bird species carried through in this assessment. That potential effect is assessed, where relevant, in the species text that follows.

7.9.65 The two main ways in which birds can be affected by operational wind farms are:

- through displacement due to ongoing disturbance caused by wind turbine structures (i.e. barrier effect) and associated equipment (and by periodic servicing of them); and
- potential mortality through collision with moving blades or associated infrastructure.

Displacement

7.9.66 A range of studies have concluded that most bird species are not significantly affected by operational wind farms (e.g. Vauk, 1990; Percival, 2005; Devereux *et al*., 2008; Winkelmann, 1994; Langston & Pullan, 2003; Hotker *et al*., 2006). This is reflected, in part, by NS guidance (SNH, 2017) on birds and wind farms which does not, for example, normally recommend surveys for breeding passerines. NS guidance, which is the UK standard, indicates that effort should focus on species and/or species groups that are thought to be susceptible to the effects of wind farms or highly protected species on which potential effects remain unclear.

7.9.67 Turbines may also present a barrier effect to the movement of birds across a site, restricting them from accessing wider areas. The effect this would have on a population is difficult to predict. If birds have to regularly fly over or around an array this may result in greater energy expenditure, while birds displaced into other, suboptimal habitats may experience reduced foraging potential. Such impacts could effectively limit birds being able to build energy reserves, potentially affecting survival and/or breeding success.

Waders

7.9.68 Of those species identified as IOFs that use the site and are carried forwards in this assessment wader species, golden plover, lapwing, oystercatcher, redshank, ringed plover and snipe have been assessed as breeding (including possibly, probably and confirmed territories) within the study area. As outlined in Table 7.4, the site is considered to be important for all these species at the Local level.

7.9.69 In addition to disturbance to birds during the construction phase, the operation of turbines and associated human activities for maintenance purposes also has the potential to disturb birds and displace them from the site. Existing information (e.g. de Lucas *et al*., 2007; Douglas *et al*., 2011; Haworth & Fielding, 2012) and reviews of effects (e.g. Madders & Whitfield, 2006; Hötker *et al*., 2006; Gove *et al*., 2013; Harrison *et al*., 2017) suggest that most birds are affected only slightly, if at all, although these effects require further study. Other studies involving long-term monitoring of golden plover (Fielding & Haworth 2010, 2012, 2013, Douglas *et al.,* 2011) and curlew (Whitfield *et al.*, 2010) found no evidence of displacement due to wind farm infrastructure for either species. In addition, in their study of the effects of wind turbines on the distribution of wintering farmland birds, Devereux *et al*. (2008) did not find any effect on four species groups (seed-eaters, corvids, gamebirds and Skylark), except for pheasant (*Phasianus colchicus*) an introduced species.

7.9.70 However, contradictorily in other studies, breeding birds have been found to be displaced within 300 m from a turbine (e.g. Gill *et al*., 1996; Percival, 1998; Hötker *et al*., 2006), with some studies suggesting some potential for partial displacement effects at greater distances (Pearce-Higgins *et*

al., 2009). Wind turbines might also displace birds from much larger areas if they act as a barrier to bird movements, or if availability of suitable habitat is restricted.

7.9.71 The evidence suggests that impacts vary between species and sites (Madders & Whitfield, 2006). There is potential for some disruption of feeding and nesting due to increased human activity for maintenance purposes, although this infrequent maintenance is unlikely to create any notable increase in disturbance as compared to current farming practices which sees activity of workers using quad bikes and other farm vehicles, which can be daily and involve workers living on the island with sheep dogs. There are limited pressures resulting from grazing livestock, only sheep are present on the island. Therefore, the overriding source of disturbance and displacement of birds during the operational period is considered to be the turbines operating (Pearce-Higgins *et al*., 2009).

7.9.72 On a precautionary basis, displacement effects on golden plover, lapwing, oystercatcher, ringed plover and redshank are likely to be limited to c.200 m around the proposed turbine locations. This distance is based on published disturbance distances for golden plover and lapwing (Yalden & Yalden, 1989, 1990; Hötker *et al*., 2005; Pearce-Higgins *et al.*, 2009) and extend to similar short sward nesting species, such as oystercatcher and redshank.

7.9.73 Any initial displacement of waders during the operational phase will likely lead to birds using other similar areas of breeding habitat within the site and wider areas including on Holm of Faray as well as Eday and Westray north and east of the site. Additionally, it is considered likely over time that the birds will habituate to the presence of the turbines and return to breeding locations close to the site infrastructure and a grazing management plan outlined in the additional mitigation (see Section 7.10) will provide improved breeding habitat in the southern and northern sections of the site, with low levels of disturbance from farming activities and reduced egg and chick loss due to trampling by sheep.

7.9.74 The overall displacement effects on breeding waders on the site (i.e. golden plover [one possible affected territory], lapwing [five], oystercatcher [nine], ringed plover [one], redshank [three] and snipe [nine] are therefore assessed to be significant at no more than the local level. Given the availability of suitable habitat (beyond the likely extent of displacement) within the site and wider area, and the likelihood (based on research referenced above) that population-level effects will not occur.

7.9.75 Given the availability of alternative breeding habitat directly adjacent within the site and islands in close proximity to the site and the proposed mitigation the effects on waders are of **low** adverse level of medium-term duration and the effects not significant.

Seabirds, Skuas and Gulls

7.9.76 Due to their adaptability to humans and the uniformity of the similar available habitat (almost the entirety of the site is made up grassland fields, grazed by sheep) away from the site infrastructure it is deemed likely that the gull species and the single great skua will relocate elsewhere on the island to breed. There is also similar habitat to the site north on the Holm of Faray and larger islands Eday to the east and Westray to the north.

7.9.77 Given the availability of alternative breeding habitat directly adjacent to the site, the ability of these species to habituate to humans and the proposed mitigation the effects on seabirds are of low adverse level and of short-term duration and the effects not significant.

Storm petrel

7.9.78 Due to the informed and iterative process employed while designing the Proposed Development, all infrastructure has been located over 100 m from breeding storm petrel burrows (with the exception of the single burrow found within the stone structure within 50 m of a main track junction which may need to be relocated depending on the timing of construction works, as discussed in Paragraph 7.9.60) and the proposed mitigation mean that there will be no further impacts of operational displacement during operation of the proposed Development. As such, no impact is predicted on this species as a result of the operation of the Proposed Development.

Collision

7.9.79 For the purposes of this Section of the ornithology EIA Report all collision risk modelling (CRM) and analyses were completed following best practice guidelines and recommended species-specific biometrics and avoidance rates (Band et al., 2007 and SNH 2000, 2010, 2013, 2017 and 2018a). Collision risk analysis was informed by the data obtained during the VP surveys and corresponding flight lines (Figure 7.4-7.13); full details of the calculations are provided in Technical Appendix 7.2.

Greylag goose

7.9.80 Data collated by Dürr (2019) indicate there have been 31 collisions of greylag goose with wind turbines recorded in Europe to date (latest update 09 January 2019). Of these, 16 have been in Germany, six in the Netherlands, four in Norway, three in Spain, one in Austria and one in Belgium. None have been reported in the UK.

7.9.81 With a total of 9,899 seconds recorded at collision height and a species-specific avoidance rate of 99.8 % it is predicted that 0.15 collisions will occur per annum. Although the Applicant is seeking planning permission in- perpetuity in order to create a figure for comparison with other wind farm sites and use in the cumulative assessment a figure for 25 years is used as the 'lifetime' of the Proposed Development this equates to 3.85 collisions potentially occurring. Mitchell *et al.* (2012) estimate that the wintering population of greylag geese on Orkney numbers approximately 70,000 (estimated at 10,000 of the naturalised population and 60,000 migratory Icelandic birds). The mortality predicted represents 0.0055 % of the winter greylag population and is therefore not considered to be significant.

7.9.82 Therefore, direct impacts on greylag goose as a result of turbine collision are of **barely perceptible** level and the effects not significant.

Curlew

7.9.83 There is very little publicly available literature on collision of curlew with turbines. NS have therefore accepted a default avoidance rate of 98% for this species. However, documented collisions in Europe (Dürr, 2019) are low in the context of species population level.

7.9.84 The CRM output predicted that 0.078 collisions will occur annually and that over 25 year of operation of the Proposed Development this equates to 1.94 collisions. The breeding curlew population on Orkney is an estimated 3,223 pairs, or 0.7 % of the UK total breeding population (Wilson *et al*., 2015). This is considered to be a very low collision rate (0.001 % of the Orkney population) and, as such, is not considered significant with respect to the local or Orkney population and is therefore not considered to be significant.

7.9.85 Therefore, impacts on curlew as a result of turbine collision are of **barely perceptible** level and the effects not significant.

Lapwing

7.9.86 There is very little publicly available literature on the collision of lapwing with onshore wind turbines. NS have therefore accepted a default avoidance rate of 98% for this species.

7.9.87 Following the CRM, it is estimated that 0.7 collisions will occur annually and that over 25 years of operation this may result in 17.5 collisions. The breeding lapwing population of Orkney is an estimated 5,000 pairs, or 0.7 % of the UK total breeding population. The CRM output represents 0.18 % of the Orkney population potentially colliding with turbines and is therefore not considered to be significant.

7.9.88 Therefore, collision impacts by lapwing are of **low** level and the effects not significant.

Golden plover

7.9.89 A total of 39 golden plover fatalities have been reported in Europe, according to Dürr (2019), none of which occurred in the UK. In the context of European breeding and wintering populations, this level of mortality is considered to be very low.

7.9.90 Although golden plover were assessed as holding three breeding territories within the study area (one probable and two possible territories) all of the flight time recorded at potential collision height for this species was registered during the winter non-breeding season (all flights are shown in Table A9, Technical Appendix 7.1). Five flights were recorded during the breeding season but all of these took place beneath potential collision height and so are not used for CRM purposes.

7.9.91 The CRM output predicted 0.49 collisions for golden plover occurring annually and over a notional 25 years of operation this equates to 12.1 collisions across the lifetime of the Proposed Development. The breeding golden plover population on Orkney is estimated at 1,474 breeding pairs (Wilson et al., 2015) and the wintering population is estimated at 10,000 birds meaning the mortality predicted represents 0.41 % of the breeding and 0.121 % of the wintering Orkney population and is therefore not considered to be significant.

7.9.92 Therefore, direct mortality impacts as a result of turbine collision are of **low** level and the effects not significant.

Oystercatcher

7.9.93 There is very little publicly available literature on collision of oystercatcher with wind turbines. NS have therefore accepted a default avoidance rate of 98 % for this species.

7.9.94 The CRM output predicts a collision rate of 0.19 collisions per annum, equating to 4.9 collisions over a notional 25 year operation of the Proposed Development. The oystercatcher breeding population on Orkney is estimated at 10,000 pairs. The CRM predicted collision rate represents 0.0245 % of the Orkney population colliding every 25 years and is therefore not considered to be significant.

7.9.95 Therefore, direct mortality impacts as a result of turbine collision are of **barely perceptible** level and the effects are not significant.

Snipe

7.9.96 Studies at four windfarms in Orkney recorded a total of 11 snipe carcasses between 2009 and 2018 (Upton, 2018). Wider studies that are publically available are limited and NS have accepted a default avoidance rate of 98 % for this species.

7.9.97 The CRM output predicts a collision rate of 0.14 collisions per annum, equating to 3.6 collisions over a notional 25 year operation of the Proposed Development. The snipe breeding population on Orkney is estimated at 3,326 pairs (Wilson et al., 2015). The CRM predicted collision rate represents 0.05 % of the Orkney population colliding every 25 years and is therefore not considered to be significant.

7.9.98 Therefore, direct mortality impacts as a result of turbine collision are of **barely perceptible** level and the effects are not significant.

Great skua

7.9.99 No collisions of great skua with wind turbines in Europe have been documented by Dürr (2019). Upton (2014c) suggest that the initial NS recommended avoidance rate of 98 % is a precautionary rate and that an avoidance figure of 99.5 % (as used in the CRM for great skua in this assessment) is more likely to be appropriate. This is supported through post construction carcass searching at the operational Burgar Hill wind farm, Hammars Hill wind farm and Hoy community turbine schemes (Upton, 2012b), which has resulted in no evidence of great skua collisions being found. Furthermore, Furness (2015) provides anecdotal evidence that great skua carcasses typically remain in-situ for long-periods due to an apparent reluctance of great skua to scavenge their kin (despite frequently scavenging carcasses of other species). Carcass searches are therefore likely to be a reliable monitoring method for this species, and the conclusions drawn by Upton (2014c) are considered to be robust.

7.9.100 The CRM provided an output of 0.03 collisions will occur during the breeding season, equating to 0.65 collisions over the notional 25 years of operation of the Proposed Development. The great skua breeding population on Orkney is estimated at 1,868 pairs (Wilson et al., 2015). The modelled

collision rate represents 0.0174 % of the Orkney population and is therefore not considered to be significant.

7.9.101 Therefore, direct mortality impacts as a result of turbine collision are of **barely perceptible** level and the effects not significant.

Red-throated diver

7.9.102 Dürr (2019) reports one documented collision for red-throated diver in Europe, occurring at Bremen, Germany. It is possible that the species' tendency to avoid wind farms (e.g. Halley & Hopshaug, 2007; Percival, 2014; Petersen, 2007; Topping and Petersen, 2011) precludes collision risk to some degree. Okill (1992) reports the discovery of a red-throated diver assumed to have been killed by flying into overhead wires, and Furness (2015) provides two further examples of birds reportedly flying into fences on Foula. Furness (2015) further suggests that red-throated diver may actively avoid turbines due to their vulnerability of colliding with objects that they cannot detect over distance, which, given the lack of breeding habitat for this species within the site and surrounding 2 km in all directions around the site, is of relevance to the Proposed Development. Post construction monitoring work by Upton (2012a; 2014a, 2014b) at Burgar Hill Wind Farm, Orkney, did not find any evidence of red-throated diver collision over eight breeding seasons of monitoring.

7.9.103 The diver flightlines during the breeding season all followed an east west axis over the island therefore CRM for this species used the linear rather than random model (See Appendix 7.2), and provided an output of 0.03 collisions per annum, equating to 0.82 collisions over a notional 25 year operation period of the Proposed Development. The red-throated diver breeding population on Orkney is estimated at 97 pairs (Wilson et al., 2015). The modelled collision rate over a 25 year period represents 0.42 % of the Orkney population and is therefore not considered to be significant.

7.9.104 Therefore, direct mortality impacts as a result of turbine collision are of **low** level and the effects not significant.

Storm Petrel

7.9.105 Night-time surveys did not identify any storm petrels flying at potential collision risk height at any of the six turbine locations, with all recorded flights at these locations noted as below 10 m in height. For this reason, CRM was not undertaken for storm petrel and the potential for this species colliding with wind turbines is considered to be **negligible** and not significant.

Decommissioning

7.9.106 The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan.

7.10 Additional Mitigation and Enhancement

7.10.1 In the event of consent and in addition to the provision of generic mitigation measures (see Section 7.8), the following specific measures are designed to avoid, reduce and enhance identified ornithological features on the site.

Storm Petrel

7.10.2 Specific mitigation for breeding storm petrel will focus on two approaches. Firstly, the prevention of increased predation and secondly through enhancement by creating a new, stable nesting structure within the vicinity of the largest colony with the aim of supporting the current population and increasing storm petrel breeding numbers.

Biosecurity

7.10.3 Storm petrel are highly vulnerable to predation being a ground nesting species, with opportunistic bird species such as gulls and skuas likely to predate both birds and eggs whenever the chance arises. However, storm petrel are considered more vulnerable to predation by brown rats (*Rattus norvegicus*) and the occurrence of breeding colonies in the northern isles of Scotland rely on the absence of brown rats (de Leon *et al.*, 2006). With this is in mind, it is critically important that during the construction and operation of the wind farm that strict biosecurity measures are put in place and followed to prevent the introduction of potential predators accessing the island and desecrating not only nesting storm petrel but other ground nesting birds across the island, such as waders, gulls and terns.

7.10.4 The RSPB have produced a series of biodiversity guidelines in order to prevent recolonization of the Shiant Isles by rodents and thus protecting burrow nesting birds, including puffin (Fratercula arctica) (Thomas and Varnham, 2016). Prior to the construction and operation of the wind farm a 'Biosecurity Plan' is required to be drafted and agreed with NatureScot and Orkney Islands Council and will be put in place to prevent rodents being introduced to the site.

7.10.5 The Biosecurity Plan will include consideration of the following:

- humane rodent traps on board vessels and around all landing areas;
- only run mooring lines if essential;
- all mooring ropes that are used to have mooring hoods and line guards;
- before unloading all packed gear to be thoroughly inspected for rodent evidence;
- all construction staff to be fully briefed by site ECoW to identify signs of rodent presence both on board vessels and on the site; and
- position the mooring so the boat stays in the water at low tide to prevent rodent access.

New Breeding Habitat

7.10.6 The main storm petrel breeding colony is located along the north-west corner of the island within a partially collapsed dry-stone dyke that shows signs of ongoing decay. In order to further support the storm petrel colony on the site, it is proposed that collapsed sections of the dyke are carefully re-built with suitable petrel breeding burrows located within.

7.10.7 Bolton *et al.* (2004) outline the use of plastic nest boxes for storm petrels in the Azores, where the provision of 115 plastic nest boxes covered with stones saw a 12 % increase in breeding numbers in the first year of occupation, increasing to 28 % in the second year. Bedolla-Guzman *et al*. (2016) outlined the use of a combination of wood and concrete nest boxes to create new breeding habitat for storm petrels off the coast of Mexico, although uptake was slow, evidence of successful breeding was recorded. Bolton (1996) outlined that nest uptake in artificial nests was not significantly different in artificial nests as compared to natural nest. Overall, 36 % of 81 boxes were used each year, with 26 nests on a boulder beach used more often than 55 nests in dry stone walls (46 % vs. 31-33 % respectively). The nests had a nesting chamber of 10 cm long, 15.2 cm diameter PVC piping, an observation chamber and a 6 cm diameter entrance tunnel. A relatively small section of wall can potentially house a large number of nest cavities, as demonstrated by a storm petrel wall on Skokholm Island off the southwest coast of Wales upon which an artificial nesting structure was erected approximately 10 m in length and was subsequently able to support 100 nesting storm petrel (The Wildlife Trust of South and West Wales, 2017).

7.10.8 It is proposed to build up sections of the dyke that have collapsed, or are showing signs of imminent collapse, being careful to leave parts that are still actively used by nesting petrels. Cavities within the wall will be water tight to keep dry and entrance holes will be small enough to allow access to smaller bird species (such as storm petrels) but restrict predation by larger species such as gulls, will be incorporated into the structure. The north of the island is both currently the preferred breeding location for petrels on the island and also well away from both proposed construction disturbance

and operational turbines. The new structure will be in the northwest of the island and will be installed ahead of the breeding season in April and prior to the commencement of construction of site infrastructure on the island top, if practical, it will be built 12 months (or more) ahead of construction to allow birds to familiarise themselves with the replacement structure for a full breeding season. The location of the newly created structure will be completed out with both the seal and bird breeding seasons (i.e. between the end of December and end of March) and created so not to modify areas already used by petrel or impinge on the seal breeding grounds. . If work is required after March 31st, the SQE will search areas of clearance in advance of works and buffer active nests as appropriate.

7.10.9 Possible locations for the new sections of petrel wall are shown in Figure 7.15. Proposed sections of wall are to be created while also ensuring a reasonable stand-off from the archaeologically protected chambered cairn also in the northern section of the site.

7.10.10 Artificial colonies such as this can be designed in such a manner as to enable easy access for monitoring breeding activity while also limiting potential for any disturbance. The monitoring of breeding success at the colony, with all nesting locations known and access for activities such as ringing chicks and an ongoing storm petrel monitoring program, would provide data needed to ensure the enhancement of the breeding colony habitat is successful. As such throughout construction and operation of the proposed wind farm development detailed monitoring of the colony will be undertaken.

7.10.11 A full monitoring program of storm petrel colony is proposed, focusing on the newly created nesting habitat with a yearly full island callback count to be completed in late June / July in each of the first five years following construction of the nest wall. This will be repeated every three years thereafter throughout the operation of the Proposed Development. Further monitoring will include a minimum of two visits a year for the first five years and again each three years thereafter for another five visits, throughout a total of 20 years of operation, for ringing and monitoring of the storm petrel on the island.

7.10.12 There is a single storm petrel nesting location in a boulder pile directly alongside the track in the south of the island. It is deemed highly unlikely that the development will in any practical way be able to avoid disturbance to this breeding location, pending what time of year construction commences. If disturbance to the nesting location is unavoidable then it is required to relocate (and rebuild or recreate if unable to move in complete condition) the boulder pile a minimum of 100 m away from site infrastructure and turbines (See Figure 7.15). In advance of being moved either whole or brick by brick the boulder pile will first be checked by an archaeologist. In addition to the relocation of the above nest, it is proposed to ensure the pointing and stone work within the small structure adjacent to the landing area is maintained in order to prevent the structure, which is currently assessed as unsuitable for breeding storm petrels, deteriorating and providing suitable habitat for breeding petrels. The maintenance of this structure will prevent colonisation by storm petrels in an area likely to be highly disturbed during both construction and operation of the wind farm and encourage newly colonising birds to use habitat elsewhere on the island away from site infrastructure, most notably the newly constructed 'stone petrel wall'.

Waders and other ground nesting species

7.10.13 The island is a working sheep farm and the entire island is grazed by sheep at certain times of year. The current grazing regime involves the use of temporary fencing to prevent sheep accessing certain areas around the island during lambing in particular the sections of higher cliffs, in order to prevent lambs falling over cliff edges. In order to provide areas of longer grassy sward and a mosaic of grassland swards on the island for the benefit of ground nesting birds it is proposed to extend these fenced off areas (using a combination of permanent or currently standing fencing and temporary fencing). Sheep will be excluded out of these fenced off areas (See Figure 7.15) between the start of April and the end of June to allow the completion of incubation of ground nesting species such as lapwing, snipe and oystercatcher. In agreement with the tenant, a total of 16.6 hectares will be included in the areas of restricted grazing and the variable sward heights in these areas will also provide good foraging areas for some wading species as well as cover for incubating and newly hatched birds.

7.11 Residual Effects

7.11.1 Following the application of mitigation measures, which include land management, residual effects of the Proposed Development on ornithological interest are as follows:

7.11.2 During the construction phase the following impacts may occur:

- Disturbance and displacement of wintering greylag goose, curlew, lapwing (potentially one displaced and up to 11 territories disturbed), golden plover (up to three territories disturbed), oystercatcher (three displaced and 31 territories disturbed), redshank (up to five territories disturbed), ringed plover (up to three territories disturbed), snipe (one displaced and up to 10 territories disturbed), great skua (one territory displaced), Arctic tern (up to 15 territories disturbed), storm petrel (one displaced) may occur but this will be minimised through the timing of the work and the use of buffered exclusion zones.

7.11.3 The proposed pre-construction surveys, the appointed ECoW and the adoption of grazing management measures will ensure that the death or injury of any bird is unlikely.

7.11.4 During the operation phase the following impacts could potentially occur due to the proximity of turbines:

- Displacement of lapwing (up to 5 territories within 200 m of proposed infrastructure), golden plover (up to a single territory within 200 m), oystercatcher (up to nine territories within 200 m), redshank (up to three territories within 200 m), ringed plover (single territory within 200 m), snipe (up to nine territories within 500 m), great skua (single territory within 200 m); and following mitigation measures no storm petrel nests will be disturbed.
- The potential for collision with turbines of greylag goose (one bird every 2,381 years), curlew (one bird every 2,132 years), lapwing (one bird every 140 years), golden plover (one bird every 277 years), great skua (one bird every 1,869 years), oystercatcher (one bird every 267 years) and red-throated diver (one bird every 30 years).

7.11.5 Given the implementation of the biosecurity measures and installation of nesting features within the rebuilt stone dyke on the north of the island (see paragraphs 7.10.2 – 7.10.12) there is a predicted long-term net gain for breeding storm petrel with the potential for breeding numbers to double on the island.

7.11.6 Given the grazing regime along both east and western edges of the site, both which supports good densities of ground nesting birds (see paragraph 7.10.13), it is considered that this will lead to a more favourable nesting habitat in these areas for waders and other ground nesting species. This is particularly attributed to the exclusion of sheep through the critical egg developmental and chick rearing stages which may lead to a net gain of successful fledgling rates for ground nesting species, such as lapwing, and potentially attract other species, such as curlew, to breed on the island.

7.11.7 Collision-related mortality is predicted to be very low for all species modelled and of a magnitude where it is expected that there will be no discernible population-level effect above natural mortality levels.

7.11.8 Taking into account the proposed mitigation measures, it is concluded that the Proposed Development will not have a significant adverse effect at greater than the Local level for any species using the site and immediate surrounding area. Following the successful implementation of the mitigation and enhancement measures outlined in this chapter, it is anticipated that there will be a high and significant beneficial impact on breeding storm petrel and a low and not significant beneficial impact on ground nesting waders.

7.11.9 Taking into account the proposed mitigation measures, it is concluded that the Proposed Development will not have a significant adverse effect on the integrity of any of the statutory designated sites identified as having potential connectivity with the Proposed Development.

7.11.10 There is an inherent level of uncertainty associated with ecological impact assessment (as acknowledged in CIEEM Guidance). However, post-construction monitoring (PCM) is proposed to assess the efficacy of the newly installed storm petrel breeding walls on an ongoing basis. This will consist of storm petrel monitoring across the first five then every three operational years up to 20 years (i.e. years 0, 1, 2, 3, 4 and every 3 years thereafter during 20 years of operation operation). Survey methods and timings may be adjusted across monitoring years according to each year's survey results, as well as informing other Habitat Management Plan (HMP) factors.

7.11.11 This assessment has fully considered the principles of and guidance provided by Scottish Planning Policy, the Nature Conservation (Scotland) Act 2004, the Orkney Local Development Plan 2017, and the Orkney LBAP. In particular, consideration has been given to international responsibilities and the protection of designated sites.

7.12 Cumulative Assessment

7.12.1 The cumulative assessment of effects on receptors takes into consideration other operational, under construction and in planning developments. The assessment does not include for developments at the scoping stage, in accordance with SPP and given the lack of detailed information on such proposed developments. The assessment takes into account all types of developments considered to be relevant in the context of the assessed impacts, not just wind farm developments.

7.12.2 The assessment of ornithological effects associated with the Proposed Development alone predicted no significant effects for every IOF due to the low suitability of habitat within the site, lack of breeding records and the relatively low activity levels of IOFs recorded during baseline surveys.

7.12.3 The Proposed Development lies within NHZ2 and so a qualitative cumulative assessment of the likely effects of local wind farm projects (due to the distance involved only the Orkney area of NHZ2 is considered) as shown in Table 7.5, on local IOF populations, is considered. There are approximately 500 single domestic scale turbines on Orkney and in NHZ2 which generally have no collision risk data and given the large number of those out of immediate vicinity of the site are not considered within this assessment.

7.12.4 For the purpose of this cumulative assessment it is considered that all other developments included in cumulative calculations remain as they were at installation and remain so for the assessment (25 year) period. As such, where appropriate the annual collision rates calculated for the Proposed Development are expanded to a 25 year equivalent in order to allow for comparisons between developments.

7.12.5 Collision risk modelling at the site identified negligible impacts from the results for all species, with the exception of red-throated diver where a total of 0.83 collisions were predicted over a 25 year operating period of the wind farm. This collision risk figure still predicts that impacts due to collision risk are low and are considered not to be significant. Storm petrel displacement and collision risk has not been considered on any other onshore wind farm developments on Orkney and are therefore not considered as part of the cumulative assessment.

7.12.6 The cumulative assessment therefore has been limited to disturbance-displacement of wader species and collision risk for red-throated diver, with negligible effects predicted for habitat loss associated with the Proposed Development.

Waders

7.12.7 Golden plover, lapwing, oystercatcher, redshank, ringed plover and snipe were all recorded breeding within the site and some habitat suitable for roosting or feeding may become unavailable due to displacement effects around turbines and other infrastructure. These wader species were recorded breeding within most local wind farm sites (see Table 7.5) and are relatively common breeding species in Orkney where suitable open habitats are present. A small number of breeding pairs of wader may be effected by displacement due to the construction and operation of wind farms, although in some cases, grazing management measures may help offset such losses of habitat.

7.12.8 Overall, the residual cumulative effect on the local golden plover, lapwing, oystercatcher, redshank, ringed plover and snipe population from operational displacement is classified as barely perceptible adverse and is not significant. This is also likely to be the level of significance for the contribution of wind farm projects within NHZ2 when scaled up to the relevant population (national/Scottish wintering or migrating populations).

Red-throated diver

7.12.9 An annual collision risk of 0.03 and a total figure of 0.83 over a 25 year period was predicted at the site. Other sites which performed collision risk for red-throated diver include Hammers Hill (estimated as 0.06 per annum), Evie (0.053 per annum) and Hoy (0.265 per annum). While low numbers of red-throated divers were recorded at other wind farm sites there were not sufficient data to undertake CRM (see Table 7.5). The combined estimated annual collision risk for all Orkney wind farms is therefore 0.408 with a cumulative total of 10.2 birds over a period of 25 years. The breeding population on Orkney is estimated at 97 pairs (Wilson et al., 2015). The annual collision risk modelled represents 0.21 % (5.25 % over a 25 year period) of the Orkney population and is therefore classified as barely perceptible adverse and not considered to be significant at the NHZ level.

Table 7.5 – Cumulative Assessment of Likely Ornithological Effects: Wind Farm Development in Orkney (including single turbine developments within 2 km)

Site Name	Distance from Proposed Development	Stage	Details / Description of Significant Residual Effects
Hammars Hill, Evie	19 km south-west.	Installed	At about 2 km there are up to twelve pairs of Red-throated divers. Waders were recorded breeding within the site including (Oystercatcher: 9, Lapwing: 7, Golden Plover: 1, Snipe: 10, Curlew: 12, Redshank: 5; and Short-eared owl: 1). Collison Risk Modelling (CRM) was undertaken for red-throated diver which was assessed as having an annual collision risk at 95 % avoidance of 0.29, at 97.5% 0.15 and at 99% of 0.06.
Holodyke Wind Turbine, Birsay	25 km south-west	Operational	SNH request for ornithology assessment (due to potential impacts on hen harrier, short-eared owl and red-throated diver), no details of ornithology data found on Planning Portal but as the site was approved impacts on ornithology are assumed to be acceptable.
Hesta Head, South Ronaldsay	47 km south	Approved	Golden plovers were seen relatively frequently during the spring and autumn passage periods, sizeable flocks were occasional, foraging in the general area with up to 350 present on 7 April 2011 and 16 April 2011 and 260 on 11 December 2015. Otherwise the records were occasional to frequent between late September and early May and appeared to relate to local movements of 1–50 birds, in various directions over and past the Proposed Development, often at risk height. Other listed species observed at the proposed development include; Greylag goose, Oystercatcher, Lapwing, Redshank and Curlew. The surveys for breeding birds in 2011 found two pairs of redshank and five pairs of curlew within the Survey Area, although it seemed likely that up to seven or eight pairs of curlews may have been present. No snipe were confirmed as breeding in 2011, but in 2016 up to two were seen drumming. No CRM was undertaken for red-throated diver, only a single flight was recorded off-shore from the development.
Bu arm Repowering, Stronsay	16.6 km south-east	Installed	It was assessed that four species were at risk from collision with turbine (red-throated diver, golden plover, dunlin and arctic skua). No CRM details were available.

Site Name	Distance from Proposed Development	Stage	Details / Description of Significant Residual Effects
Hammers Hill Extension	20 km south-west	Application	Hen harrier, red-throated diver, greylag goose, short-owl and golden plover were frequently observed from VP watches. Breeding bird surveys identified oystercatcher (18), greylag goose (2), ringed plover (1), red grouse (1), lapwing (2), arctic skua (1–2), snipe (2), great skua (1–2), curlew (11), common gull (5), dunlin (1) and redshank (3) territories. CRM was undertaken for greylag goose, golden plover, hen harrier as well as red-throated diver which was assessed as having an annual collision risk at 955 avoidance of 0.266, at 97.5 % 0.1333 and at 99 % of 0.053.
Work Farm, St Ola	23 km south-west	Approved	No collision risk modelling was undertaken. Ornithology surveys identified both breeding and wintering greylag geese and golden plover in the vicinity of the site. A desk study outlined the presence of wintering wading birds in the vicinity, most notably golden plover and redshank. Small numbers of breeding curlew, lapwing and oystercatcher breed in the local area.
Gallowhill	12.5 km north-west	Installed	No evidence of ornithology surveys or collision risk modelling available of the Planning Portal.
Burgar Hill, Evie	21 km south-west	Installed	As Evie wind farm. (No detailed ornithology results were detected for later turbine applications but red-throated diver were noted breeding in the vicinity of one site)
Spurness Wind Farm, Sanday	7 km east south-east	Installed	Surveys undertaken by RSPB at the site identified breeding gulls, Arctic tern, Arctic skua and fulmar. No collision risk modelling was undertaken.
Costa Head, Birsay	23 km west south-west	Application	Curlew and golden plover were recorded regularly from VP surveys. Curlew, lapwing and redshank were recorded breeding within the site in small numbers. No CRM was undertaken for red-throated diver.
Barns of Ayre, Deerness	31 km south south-east	Installed	No ornithology surveys were undertaken or collision risk modelling.

Site Name	Distance from Proposed Development	Stage	Details / Description of Significant Residual Effects
Orkney's Community Wind Farm Project - Quanterness	24 km south south-west	Application	Potential for disturbance and displacement of wintering greylag goose, wintering pink-footed goose, curlew (no direct displacement, up to 6 territories disturbance), lapwing (potentially two displaced and up to 20 territories disturbed), golden plover (up to 2 territories), oystercatcher (four displaced and up to 30 territories disturbed), redshank (up to 4 territories), ringed plover (3 territories), snipe (up to 4 territories) and Arctic tern (1 territory) No collision risk was undertaken for red-throated diver.
Orkney's Community Wind Farm Project - Hoy	48 km south-west	Application	Collision risk modelling for red-throated diver predicted an average breeding season mortality of 0.265 birds. Potential displacement of curlew (2) and snipe territories was recorded.
Akla	33 km south-west	Application	Hen harrier, red-throated diver, great skua most frequently recorded from VP watches as well as golden plover, greylag goose and whimbrel. Oystercatcher (14,18), lapwing (8,3), Snipe (12,18) Curlew (15,12), redshank (5,1) were recorded breeding good numbers. CRM was not undertaken for red-throated diver as only a single flight was recorded.

7.13 Summary

7.13.1 The ornithology study area varies dependent on the bird survey undertaken; however all surveys were carried out in accordance with relevant legislation and best practice guidelines.

7.13.2 The following birds were recorded on site:

- Wildfowl and divers – one species of swan, two species of goose, two species of diver and five duck species during the non-breeding season, only greylag goose were recorded as breeding.
- Gull – five species during both the breeding and non-breeding seasons.
- Raptors and owls - three species of scarce raptors and owls and two species of common raptor during the year, although none were recorded breeding in the site or within the 2 km survey buffer.
- Wader - ten species of waders were recorded, six were recorded breeding.
- Seabirds and skua: six species of seabirds and skuas were recorded breeding which includes a peak count of 91 storm petrel territories.
- Other grassland and moorland birds - species of conservation concern recorded during breeding surveys included three red-listed species: skylark, linnet and twite.

7.13.3 An assessment of likely effects on ornithological receptors identified no predicted significant effects.

7.13.4 An ECoW will oversee the implementation of mitigation measures including the application of best practice guidance and the avoidance, where possible, of site clearance during the bird breeding season. Should nests be discovered then they will be clearly demarcated and buffer zones established around nesting sites to prevent damage to the nests and disturbance of adults caring for young.

7.13.5 When all mitigation measures are implemented, negligible effects on birds are anticipated due to the Proposed Development and the implementation of mitigation and enhancement measures may lead to net gains with regards to storm petrel (through biosecurity measures and the installation of nesting features) as well as ground nesting bird species such as lapwing, and oystercatcher due to a grazing management plan leading to less nesting attempts failing during the incubation period. When all mitigation measures are implemented, there are no predicted cumulative impacts on birds predicted due to the Proposed Development.

Table 0.6 – Summary of Effects

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial / Adverse
Construction					
Greylag goose disturbance and displacement.	Barely Perceptible and not significant	Adverse	None.	Barely Perceptible and not significant	Adverse
Red-throated diver disturbance and displacement	Barely Perceptible and not significant	Adverse	None.	Barely Perceptible and not significant	Adverse
Curlew disturbance and displacement.	Barely Perceptible and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Lapwing disturbance and displacement.	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Golden plover disturbance and displacement.	Barely Perceptible and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Oystercatcher disturbance and displacement.	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Ringed Plover disturbance and displacement.	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Redshank disturbance	Low and not significant	Adverse	Timing of works or pre-construction check for nesting	Barely Perceptible	Adverse

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial / Adverse
and displacement.			birds. Exclusion zones during breeding season.	and not significant	
Snipe	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Arctic tern disturbance and displacement.	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Storm petrel disturbance and displacement	Medium and not significant	Adverse	Minimum 100 m exclusion zone from nesting locations, timing of works and pre-construction check for nesting birds. Enforced biosecurity plan.	Low	Adverse
Gulls	Low and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Great skua	Barely Perceptible and not significant	Adverse	Timing of works or pre-construction check for nesting birds. Exclusion zones during breeding season.	Barely Perceptible and not significant	Adverse
Shag, Black guillemot	Barely Perceptible and not significant	Adverse	None	Barely Perceptible and not significant	Adverse
Operation					
Red-throated diver – collision risk	Low and not significant	Adverse	None	Low and not significant	Adverse
Lapwing and golden plover – collision risk	Low and not significant	Adverse	None	Low and not significant	Adverse

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial / Adverse
Greylag goose / great skua /other wader collision risk	Barely Perceptible and not significant	Adverse	None	Barely Perceptible and not significant	Adverse
Storm Petrel	Low and not significant	Adverse	Creation of new breeding habitat in north of site with potential to double the island population. Continued biosecurity measures.	High and significant	Beneficial
Ground nesting waders and other species displacement	Low and not significant	Adverse	Grazing management to remain in place throughout the lifetime of scheme.	Low and not significant	Beneficial

Table 0.7 – Summary of Cumulative Effects

Receptor	Effect	Cumulative Developments	Significance of Cumulative Effect	
			Significance	Beneficial/ Adverse
Red-throated diver collision risk.	Collision mortality	A combined annual collision risk of 0.21 birds is predicted which is not considered to be significant	Barely Perceptible and not significant	Adverse
Wader collision risk / nest displacement	Disturbance, displacement and collision mortality	Wader data is not available for a number of developments across Orkney. Cumulative collision risk values for these species are very low. Some temporary displacement is likely during construction however with a HMP in place this will be offset	Barely Perceptible and not significant	Adverse

7.14 References

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