Appendix 7.1 Avian Baseline Conditions– April 2019 to March 2020

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Introduction

Overview

ITPEnergised (ITPE) was appointed by Orkney Islands Council (OIC) to undertake a suite of ornithological surveys in support of a proposed wind farm development on the island of Faray, Orkney (hereafter referred to as the 'Site'). The Site centres on Ordnance Survey Grid Reference HY 533112 036752 and its location is shown on Figure 7.1.

Site Description

The Site is an uninhabited island located 830m to the west of Eday (north-west of Fersness Bay) and south-east of Westray, lying between the Sound of Faray to the east and Rapness Sound to the west. The island is currently, and historically, been given over to crofters who use it for grazing sheep. Several drainage ditches run across the island, in addition to a few small, unmodified burn channels rising from the wetter areas. The shoreline comprises primarily rocky exposures and cliffs, with some beaches also present (south-eastern side of the southern tip; and in several locations along the western coastline). A number of other abandoned stone dwellings are also present, the majority of which have lost their roofing.

Aims

This report presents the ornithological survey work undertaken in support of the Proposed Development by ITPE between April 2019 and March 2020.

Collectively, the objectives of the surveys were to:

- map the distribution of breeding birds, including scarce and priority species;
- record the presence and abundance of birds considered to be of a conservation priority; and
- quantify the level of flight activity by birds of potential conservation importance.

Legislation and Biodiversity

Legislation

All relevant legislation and guidance documents have been considered as part of this assessment, as referenced in this report (a summary of pertinent nature conservation legislation is presented below).

Of particular relevance are:

- Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive);
- The Ramsar Convention on Wetlands 1976;
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive);
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);

- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended); and
- The Nature Conservation (Scotland) Act 2004 (as amended), which places a statutory duty on all public bodies to further the conservation of biodiversity through the Scottish Biodiversity Strategy, with Scottish priority species and habitats listed on the Scottish Biodiversity List (SBL), itself based on the former UK Biodiversity Action Plan (UKBAP), and regional biodiversity targets defined through an LBAP. The Local BAP of relevance to this report is the Orkney LBAP.

International Conventions and Directives

The Birds Directive (2009/147/EC)

The European Union (EU) Directive on the Conservation of Wild Birds (2009/147/EC) was first adopted in 1979 and is the primary mechanism for delivering the EU's obligations under the Convention on Biological Diversity (CBD), and the Ramsar and Bonn Conventions. Collectively, the Birds and Habitats Directives require Member States to take action in order to protect all bird species and their habitats which includes the designation of Special Protection Areas (SPAs) in respect to species listed on Annex I of the Directive.

Ramsar Convention

The Convention on Wetlands of International Importance (the Ramsar Convention) was adopted in Iran in February 1971 and came in to force in May 1976. The Convention considers the subject area of wetland conservation and comprises three elements of activity:

- the designation of wetlands of international importance as Ramsar sites;
- the promotion of the sustainable use of all wetlands in the territory of each country; and
- international co-operation with other countries to further the sustainable use of wetlands and their resource.

The Habitats Regulations

In Scotland, the Habitats Directive is translated into specific legal obligations by the Conservation (Natural Habitats, &c.) Regulations 1994. This piece of legislation is usually known as the Habitats Regulations.

The Habitats Regulations cover the requirements for:

- Special Areas of Conservation (SACs) and SPAs, which are sites that are internationally important for threatened habitats and species; making a network of sites designated together and known collectively as the Natura2000 network;
- species requiring strict protection – i.e. European protected species; and
- other aspects of the Habitats Directive including the management, surveillance and reporting for sites in order to ensure the favourable status of species and habitats are maintained.

The Habitats Regulations have been most recently amended in 2012.

The Convention on Biological Diversity (CBD)

The CBD was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992, and came into force in December 1993. It was the first global treaty to provide a legal framework for biodiversity conservation. The treaty has three primary goals:

- the conservation of biological diversity;
- the sustainable use of its components; and
- the fair and equitable sharing of the benefits arising from the use of genetic resources.

Signatories are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity.

The UK Government ratified the convention and published the UKBAP in 1994 and to compliment the UKBAP, separate biodiversity strategies for each of the devolved governments have been subsequently developed, including the Scottish Biodiversity Strategy, launched in 2004.

National Legislation

The Wildlife and Countryside Act

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principle mechanism for wildlife protection in the UK. Schedule 1 of the Act lists bird species that are afforded special protection. The principal designation established under the Act is the citation of Special Sites of Scientific Interest (SSSI).

The WCA also makes it an offence (with exception to species listed in Schedule 2) to intentionally:

- kill, injure, or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

Biodiversity

Biodiversity Duty Report

Under the Nature Conservation (Scotland) Act 2004, all public bodies are required to further the conservation of biodiversity when carrying out their public responsibilities and duties. Following an amendment to the Wildlife and Natural Environment (Scotland) Act 2011, public bodies are required to publish a publicly available report on the actions they have taken to meet this biodiversity duty. The first report was required to be submitted by 1st January 2015, with the next reporting round in 2018.

Scottish Biodiversity List

Scottish Ministers created the SBL in 2005 in order to satisfy the requirements under Section 2(4) of the Nature Conservation (Scotland) Act 2004 and to assist public bodies in carrying out conservation of biodiversity, and to provide the general public with information regarding conservation within Scotland. The list contains habitats, plants and species which are deemed to be of principal importance to the Scottish population and meet the social and scientific criteria. This report focuses on the scientific value of the SBL entries.

Species details, including a list of scientific criteria and reasoning for inclusion to the list, can be located within the Scottish Biodiversity List: Technical Report (Scottish Government, 2013).

The Orkney Local Biodiversity Action Plan

First produced in 2003, the most recent version of the Orkney LBAP was launched in 2018 and covers the period 2018-2022 The Orkney LBAP outlines species and habitats that are important to Orkney, along with actions that can be taken to protect them. The appendix includes a list of bird species that are considered to be of conservation concern in Orkney (Orkney Islands Council, 2013).

Species outlined in the Orkney LBAP of relevance to this study and the site include:

- hen harrier (*Circus cyaneus*);
- short-eared owl (*Asio flammeus*);
- curlew (*Numenius arquata*);
- lapwing (*Vanellus vanellus*);
- redshank (*Tringa totanus*); and
- ringed plover (*Charadrius hiaticula*).

Bird of Conservation Concern

The Birds of Conservation Concern (BoCC) is a collaboration between the Statutory Nature Conservation Bodies (SNCBs), Royal Society for the Protection of Birds (RSPB), British trust for Ornithology (BTO), Wildfowl and Wetlands Trust (WWT), Game and Wildfowl Conservation Trust (GWCT) and several other organisations. It uses an approach based on quantitative assessments against standardised criteria, in order to place individual bird species on 'Red', 'Amber' or 'Green' lists to indicate different levels of conservation concern. Red in the context of BoCC is not the same as IUCN's Red List, though IUCN status is one of the criteria used in BoCC assessment. Collectively, the changes in the numbers and proportions of species on Red, Amber or Green lists provide a gauge of the broad direction of status of UK birds and point to the degree of threat they face, as well as the efficacy of conservation measures taken. The most recent version is BoCC4 (Eaton et al 2015).

Birds on the Red and Amber lists are subject to at least one of the factors listed below:

- Red - red list species are those that are globally threatened, have had an historical population decline in the UK from 1800 -1995, a rapid (> or = 50%) decline in UK breeding population over the past 25 years, or a rapid (> or = 50%) contraction of UK breeding range over the past 25 years;
- Amber - amber listed species have had a historical population decline from 1800-1995 but are recovering; population size has more than doubled over the past 25 years, a moderate (25-49%) decline in UK breeding population over the past 25 years, a moderate (25-49%) contraction of UK breeding range over the past 25 years, a moderate (25-49%) decline in UK non-breeding population over the past 25 years, or species with unfavourable conservation status in Europe also known as Species of European Conservation Concern (SPEC); and
- Green - green listed species have no identified threat to their population status.

Consultation

Statutory

Consultation with NatureScot (NS) (formerly Scottish Natural Heritage (SNH)) was started on 8th February 2019 which confirmed the scope of the ornithology surveys, the location of the vantage points (VPs) and corresponding viewsheds was agreed later in April 2019. It was agreed with NS that no diver specific VP watches would be undertaken unless evidence of breeding for these species was recorded. However, given the fact that Faray is an island that additional seabird surveys would be required for a robust assessment, including species such as storm petrel (*Hydrobates pelagicus*), shag (*Phalacrocorax aristotelis*) and black guillemot (*Cepphus grylle*). It was also agreed that no dedicated breeding raptor surveys would be required due to their being no suitable habitat on Faray for breeding raptors that are likely to be found in Orkney, such as hen harrier, merlin and short-eared owl.

Methods

Overview

This section describes the methods used for the ornithological surveys, which comprised a combination of desk study and field survey.

Desk Study

An ornithological desk study was undertaken to compile existing baseline data for the Site and local area.

In terms of nature conservation designations, the desk study aims to identify international and national statutory designations, such as SPAs, Ramsar wetlands, SSSIs, National Nature Reserves (NNRs) or Marine Nature Reserves

(MNRs) within 10km of the Site boundary. Only ornithological features are considered relevant to the present study. Any Local Nature Conservation Sites (LNCSs) or non-statutory designations, such as Local Biodiversity Sites, were identified within a 2km distance of the Site boundary.

Existing records that are freely available for commercial use of protected or otherwise notable species (e.g. SBL/LBAP priority species) were identified with a 5km distance of the Site boundary. Records from the last 10 years were considered relevant to the study. In addition, SNH outlined historic records of breeding seabirds on the island collected by the JNCC (2018).

Data for priority / notable species and designated sites were obtained from the following databases:

- Orkney Wildlife Information & Records Centre (Orkney Wildlife Information & Records Centre, 2019);
- National Biodiversity Network (NBN) Atlas;
- Scottish Natural Heritage (SNH) SiteLink;
- Scotland's Environment Interactive Map; and
- MAGIC: Nature on the Map (MAGIC, 2019).

In addition, the Orkney Raptor Study Group (RSG) were contacted to obtain breeding records for Schedule 1/Annex 1 raptors and owls within 2km of the site boundary.

Field Surveys

Determination and Selection of Vantage Points

Pre-scoping consultation with NS, combined with the results of the desk study, identified that VP surveys would be required to account for the potential presence of 'scarce' diurnal raptors, waterfowl and wading bird species within and adjacent to the Site.

Two VPs at a single location were established in the centre of the island using GIS software combined with Ordnance Survey digital data. The VP location was placed to cover the area of the Site which is displayed within Figure 7.1. The VP location and the corresponding viewsheds were verified during a site visit on 29th April 2019. VP locations and bearings are provided in Table 1..

Table 1 - VP Location and Orientation

VP	Grid Reference	Bearing
1	HY52354 36488	180°
2	HY52354 36488	0°

Diurnal Vantage Point Surveys

Surveys at the Site commenced in April 2019, during which Information on bird flight activity was collected throughout timed watches using recommended guidance and methods as outlined by SNH (2017). A total of one year of data has been gathered in order to support a future Ecological Impact Assessment (EcIA) for the Proposed Development. Surveyors undertook the surveys in such a way as to minimise the potential for

disturbance impacts on bird behaviour associated with their presence near the Site, including arriving at the survey point a minimum of 15 minutes prior to the commencement of each VP watch.

All surveys were stratified, where possible, across three daylight periods (termed 'dawn', 'day' and 'dusk') to allow for diurnal variation in activity rates. All surveys comprised watches lasting no more than three hours in duration and a minimum of 30 minutes break was observed by the surveyor between subsequent watches.

All surveys were undertaken by a single observer in a wide range of weather conditions, but mainly in conditions of good ground visibility (> 2 km) and timings were adjusted to account for changes in sunrise and sunset times within each survey season.

During each VP watch, two methods of recording were used comprising focal sampling of target species and activity summaries of secondary species. Observations were recorded using 10m bands as no turbine specification was available at the commencement of the survey. It was outlined that the maximum tip height would not likely exceed 150m and all recordings above 150m were in a single band of 150m+. Thus the height bands used were:

- HB1: < 10 m;
- HB2: 10 ≥ < 20 m;
- HB3: 20 ≥ < 30 m;
- Etc.; and
- HB15+: ≥ 150 m.

Data were entered in the field onto recording sheets and later transferred to a Microsoft Excel spread sheet for analysis. During each VP watch, target species flight data were also cross-referenced with maps of flightlines recorded on field survey maps.

In line with the candidate turbine, the expected collision risk height with turbine blades is between 14 m and 150 m (i.e. blade length of approx. 67.5m) and so the VP data were merged into three height bands for analysis:

- HB1: < 10 m;
- HB2: 10 ≥ < 150 m (potential collision height); and
- HB3: ≥ 150 m.

The total number of survey hours over the year at the VP location comprised:

- VP1 – 36 hours breeding season.
- VP2 – 36 hours breeding season.
- VP1 – 36 hours non-breeding season.
- VP2– 36 hours non-breeding season.

Full details of the survey dates and timings are shown in Annex A: Table A1.

Breeding bird walkover surveys

As the Site consists of the island of Faray in its entirety, typical survey buffers extend out into open waters of the surrounding sea. As such, reference to the "Study Area" refers to the main Site area (i.e. the whole island of Faray) and, where applicable, as far as 2km out into open waters.

A Brown and Shepherd (B&S) type method of census for upland breeding wader populations (Brown and Shepherd, 1993) was used to survey the Site for breeding birds (as per Bibby et al., 2000 and Gilbert et al., 1998). Due to the nature of the Site, no 500m survey buffer was required, although any notable records seen on the neighbouring Holm of Faray, 300m north of the Site boundary, were recorded. In addition to the wader

populations the walkover visits were used to identify a number of other ground nesting species with peak counts as outlined by JNCC methodologies for skuas, gulls and terns as well as passerine species.

A total of four breeding bird survey visits were undertaken between April and July 2019. Surveys took cognisance of SNH guidance (SNH, 2017) and were undertaken of open areas within the Study Area. The survey approach focussed on identifying approximate numbers of breeding pairs of each target species including: Annex 1, WCA Schedule 1, red list and/or SBL/Orkney Local Biodiversity Action Plan species.

The standard method for the B&S survey involves two complete mapping visits during the breeding season to allow for differences in detection rates between early and late breeding species, however, four survey visits were undertaken, as recommended (SNH, 2017). The B&S survey was modified slightly so that visits were undertaken in line with recommended guidance and timed to avoid the main periods of rapidly changing bird activity at dawn and dusk and to account for species other than just waders. Subsequent survey visits were completed while ensuring more than the minimum two week period between visits.

When individuals or pairs of birds were encountered, the ornithologist determined whether the bird(s) were different from any previous observations. This involved careful attention to the whereabouts and movements of birds, together with birds' sex and plumage characteristics. To minimise the risk of double counting, behaviour and location of birds were carefully observed so that previously encountered birds were not recorded twice. Surveys were not conducted in winds greater than Beaufort Force 5 or in persistent rain, or when visibility was poor (i.e. less than 500m).

The survey visits were undertaken on:

- Survey visit 1 (April): 28th;
- Survey visit 2 (June): 1st;
- Survey visit 3 (June): 25th; and
- Survey visit 4 (July): 25th.

Breeding Raptor Surveys

Due to the fact that the Site is an island, dedicated breeding raptor surveys were not undertaken as the majority of the 2km survey buffer usually required for raptors is open sea. The entire island was searched for breeding birds during the breeding bird walkover survey and in order to check areas of land within 2km of the Site the ORSG were contacted for breeding data for the two previous breeding seasons.

Nesting Seabird Surveys

A nesting seabird survey was carried out during the breeding months from April to August, inclusive, and covered the entire island of Faray and followed guidelines as outlined in the Seabird Monitoring Handbook (Walsh et al., 1995).

The following surveys were undertaken for ground-nesting seabirds and were incorporated where possible into the full island breeding bird walkover visits outlined above:

- 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; and
- Arctic tern (Sterna paradisaea) – weekly visits using vantage points to count incubating adults mid-May to mid-June.

The following surveys were completed for cliff nesting birds:

- Black guillemot – two walkover surveys to count pre-nesting 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; and

- Shag – a full island census by boat of apparently occupied nests completed on 30th May.

In addition, due to the potential presence of breeding storm petrels a full island storm petrel call-back survey was undertaken on 24th, 27th and 28th June 2019. Due to the fact that birds are not visible to surveyors, storm petrel require very specific monitoring methodology (as outlined in Gilbert et al., 1998), and involves playing recordings of storm petrel calls and listening for return calls from adult birds within breeding areas: in this case walls and associated boulders and other structures on the island.

Due to the difficulties of surveying for cliff-nesting species of bird, the survey counts define "adults on nest" (AON) as a total for a colony count.

Additional Storm Petrel Work August 2019 and July 2020

In addition, to the callback survey in late June 2019, and following discussions with NS, further storm petrel survey work was carried out in 2019 and 2020. In order to assess flight activity over the island by storm petrel, nocturnal 'celiometry' surveys were undertaken in July and August 2019 and repeated again in July 2020. In addition, a second storm petrel call-back survey, including full calibration (as outlined in Gilbert et al., 1998) was also completed in July 2020. Full details of survey methodology and results are outlined in a standalone report: Faray Storm Petrel Survey Report, ITPE (2020).

Winter Walkover Surveys

A winter walkover survey was completed covering the Site in its entirety, with three visits completed between February and March 2020 to identify winter roosting and foraging bird populations within the Study Area. The surveys were carried out in line with methods detailed in Gilbert et al. (2011) and consisted of three visits undertaken on:

- ***Survey visit 1: 26th February 2020;***
- ***Survey visit 2: 20th March 2020; and***
- ***Survey visit 3: 21st March 2020.***

As with the breeding walkover bird surveys, the winter walkover survey focused on identifying the presence and/or absence for each target species including Annex 1, Schedule 1, red list, WPL and Orkney LBAP species

Survey Limitations

Access to the Site, being a rugged uninhabited island, 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.

In addition, ITPE made a commitment not to undertake surveys between mid-September and early 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 a Special Area of Conservation (SAC) for supporting. Grey seals use sections of the island to pup, including the area around the landing jetty (please refer to Seal survey Report (ITPE, 2020) for more details on this marine mammal SAC). The gap in non-breeding 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, which was imminent due to covid-19. 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. There was no evidence of large numbers of geese (i.e. areas of droppings and feathers) while the closely cropped grassland is not deemed optimal habitat for foraging or roosting by Schedule 1 raptors, such as merlin and hen harrier.

Baseline

Desk Study

Site Designations

As summarised in Table 2, and displayed on Figure 7.2, one international, two proposed international and five national nature conservation designations occur within 10km of the site.

Table 2 - Nature Conservation Designations (bird related sites only) within 10km of the Site

Name	Designation	Distance & Direction	Qualifying Features	
Doomy and Whitemaw Hill	SSSI	2.5km SSE	Species:	Breeding whimbrel (*Numenius phaeopus*) and Arctic skua (*Stercorarius parasiticus*).
Mill Loch	SSSI	2.6km E	Species:	Breeding red-throated diver (*Gavia stellata*)
Calf of Eday	SPA	2.7km NE	Assemblage:	A seabird assemblage of international importance
	SSSI	2.7km NE	Species:	Important nesting site for cormorant
North Orkney	Proposed SPA	5.1km SW	Species:	Breeding red-throated diver. Non-breeding common eider (*Somateria mollissima*), shag (*Phalacrocorax aristotelis*), great northern diver (*Gavia immer*), long-tailed duck (*Clangula hyemalis*), red-breasted merganser (*Mergus serrator*), slavonian grebe (*Podiceps auritus*) and velvet scoter (*Melanitta fusca*)
Rousay	SPA	6.1km WSW	Assemblage:	A seabird assemblage of international importance
			Species:	Breeding arctic tern (*Sterna paradisaea*)
	SSSI	8.2km SW	Assemblage:	Breeding bird assemblage (moorland), seabird colony
			Species:	Breeding Arctic skua, Arctic tern, guillemot (*Uria aalge*) and kittiwake (*Rissa tridactyla*)

Name	Designation	Distance & Direction	Qualifying Features	
Onziebust	RSPB Reserve	7.2km SW	Species:	Corncrake (*Crex crex*), curlew (*Numenius arquata*), lapwing (*Vanellus vanellus*) and redshank (*Tringa totanus*)
West Westray	SPA	9.8km NW	Assemblage:	A seabird assemblage of international importance
			Species:	Breeding Arctic tern and guillemot
	SSSI	11.5km NW	Species:	Breeding Arctic skua, Arctic tern, kittiwake and razorbill
			Assemblage:	Seabird colony

Non-statutory Designations

A single locally designated site, Braehead Local Nature Conservation Site (LNCS), designated for biological reasons within 2km of the site boundary, located on the west coast of Eday (OIC, 2017b). No detailed reason for designation was detailed for the LNC site. The coast of Faray and Holm of Faray is also an RSPB Important Bird Area (IBA).

JNCC Seabird Data

The JNCC survey data revealed a total of thirteen breeding species having been recorded on Faray, including: Arctic skua, Arctic tern, common gull (*Larus canus*), 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

Following consultation with the ORSG it was confirmed that there are no records of Schedule 1 species (such as hen harrier, merlin (*Falco columbarius*) or peregrine (*Falco peregrinus*) were recorded as breeding within 2km of the Site in 2018 and 2019.

Survey Results

Scarce Raptors and Owls

Three Schedule 1 species were recorded during the ornithological surveys completed between April 2019 and March 2020; hen harrier, merlin and peregrine of which none were recorded as displaying behaviour indicative of breeding activity.

Hen Harrier

Seven flights of individual hen harrier were recorded throughout the VP surveys, with a flight in August, three in September, two in February and one in March (Annex A: Table A12; flightlines presented on Figure 7.3). Three records were of a male bird in February and March and the other of a juvenile/female (i.e. a “ringtail”) bird recorded in August and September. The total flight time recorded was 456 seconds of which 391 seconds were recorded under 10m in height.

No evidence of breeding activity for this species on the island or within 2km of the Site was evident in the data obtained from the ORSG.

Merlin

Four flights of an individual juvenile/female type merlin were recorded on March 19th and 20th during VP surveys (Annex A: Table A14; Figure 7.3). The total flight time was 92 seconds all recorded below 20m in height.

No evidence of breeding activity for this species on the island or within 2km of the Site was evident in the data obtained from the ORSG.

Peregrine

Three flights of peregrine were recorded during VP surveys, two on 19th March and one on 21st March (Annex A: Table A16; Figure 7.3). The flight duration recorded totalled 479 seconds with 469 seconds recorded at 70m in height.

No evidence of breeding activity for this species on the island or within 2km of the Site was evident in the data obtained from the ORSG.

Non-schedule 1 Raptors and Raven

Kestrel (*Falco tinnunculus*) was recorded once and sparrowhawk (Accipiter nisus) on five occasions within the Site during VP surveys. Raven (*Corvus corax*) were frequently recorded during VP surveys and were assessed as nesting on cliffs in the south-east of the island.

Waders

Curlew

Curlew were regularly recorded within the Site between April 2019 and March 2020. A total of 24 flights were recorded during VP surveys, totalling 34 birds (Annex A: Table A7; Figure 7.4). The total flight time recorded for this species was 1,106 seconds, of which 664 seconds was recorded between 10 and 150m in height. Curlew were not assessed as a breeding species on the island. Curlew were commonly recorded in low numbers around the island during each of the wintering bird survey visits.

Dunlin

A single flight of a dunlin was recorded on February 26th 2020 and a single bird was heard calling on 25th June during VP surveys (Annex A: Table A8; Figure 7.8). The total flight time recorded for this species was 50 seconds. Dunlin were not assessed as a breeding species on the island.

Golden Plover

Golden plover (*Pluvialis apricaria*) were registered within the Site on 21 occasions during VP surveys with a total of 309 birds recorded (Annex A: Table A9; Figure 7.5). The total flight time recorded was 819 seconds, of which 456 seconds was recorded between 10-150m in height. A total of three golden plover territories (one probable, two possible) were assessed following the breeding bird walkover survey (Figure 7.5). Golden plover was a commonly recorded species in low numbers on the island top during each of the wintering bird survey visits.

Lapwing

A total of 106 flights of lapwing were recorded during the VP surveys with a total of 503 birds recorded (Annex A: Table A13; Figure 7.6). The total flight time recorded was 7852 seconds, of which 5,478 seconds was recorded at under 10m in height and a further 2,272 seconds between 10m and 150m. A total of 11 lapwing territories (3 probable, 8 possible) were assessed within the Site following the breeding bird walkover survey (Figure 7.6). Lapwing were commonly recorded in low numbers in the south of the island during each of the wintering bird survey visits.

Oystercatcher

A total of 47 flights totalling 117 oystercatcher (*Haematopus ostralegus*) were recorded during VP surveys with a maximum of nine individuals recorded on 25th July (Annex A: Table A15; Figure 7.7). The total flight time

recorded was 2,057 seconds, of which 1,1197 seconds was recorded at under 10m in height and the further 846 seconds taking place between 10m and 150m. A total of 31 oystercatcher territories (14 probable, 17 possible) were assessed within the Site following the breeding bird walkover survey (Figure 7.7). Oystercatcher were commonly recorded in low numbers around the island during each of the wintering bird survey visits.

Purple Sandpiper
Purple sandpiper (*Calidris maritima*) were recorded in the south of the island on all three wintering bird survey visits with a maximum count of 25 on the third visit.

Redshank
A total of 14 flights of 17 redshank were recorded during VP surveys (Annex A: Table A18; Figure 7.8). The total flight time recorded was 198 seconds, of which 155 seconds was recorded at under 10m in height. A total of five redshank territories (three probable, two possible) were assessed within the Site following the breeding bird walkover survey (Figure 7.8).

Ringed Plover
Two flights totalling seven ringed plover (*Charadrius hiaticula*) were recorded during VP surveys (Annex A: Table A20; Figure 7.8). The total flight time recorded was 40 seconds. A total of three recorded possible territories during the breeding bird walkover survey (Figure 7.8).

Sanderling
Sanderling (*Calidris alba*) were recorded in small numbers during the first and second visits of wintering bird walkover survey with a peak count of 16 on the first visit in February.

Snipe
Ten flights totalling fifteen snipe (*Gallinago gallinago*) were registered during the VP surveys (Annex A: Table A21; Figure 7.8). The total flight time recorded was 878 seconds, of which 858 seconds was recorded between 10m and 150m in height. A total of ten snipe territories (two probable, eight possible) were assessed within the Site following the breeding bird walkover survey (Figure 7.8).

Turnstone
Four flights totalling ten turnstone (*Arenaria interpres*) were recorded from VP surveys and total flight time was 134 seconds (Annex A: Table A22; Figure 7.8). Turnstone were recorded during all three winter walkover surveys with a peak count of 40 on the first visit in February. Turnstone are not a breeding species within the UK and these are likely migrant and over wintering birds returning from breeding grounds in the northern tundra and Arctic.

Geese, Wildfowl and Diver

Whooper Swan
A single flight of two whooper swan (*Cygnus cygnus*) was recorded on 19th March 2020 from VP surveys (Annex A: Table A23; Figure 7.13). The total flight time was 45 seconds.

Greylag Goose
Greylag goose (*Anser anser*) were recorded on 41 occasions from VP surveys, with a maximum count of 47 birds recorded on 26th July 2019 and a total count of 232 (Annex A: Table A11; Figure 7.13). The total flight time recorded was 2,309 seconds, of which 797 seconds was recorded at below 10m in height. A single breeding record was recorded in the centre of the island (Figure 7.14).

Pink-Footed Goose
A single pink-footed goose (*Anser brachyrhycnus*) was recorded on 20th March 2020 from VP surveys (Annex A: Table A17; Figure 7.13). The total flight time was 60 seconds and took place at collision height. A single bird was noted in the sea south-east of the island on the first winter walkover in February 2020.

Red-Throated Diver
Red-throated diver were recorded on nine occasions totalling ten birds from VP surveys, six of the flightlines were direct east and west across the island to and from the direction of Eday indicating a possible breeding location on Eday (Annex A: Table A19; Figure 7.13). The total flight time recorded was 650 seconds, of which 110 seconds was recorded below 10m and the remaining 540 seconds between 10-150m. No evidence of breeding activity was recorded for this species during the breeding bird walkover survey.

Great-Northern Diver
Great-northern diver were recorded in small numbers out on the open water during each of the wintering bird survey visits with a peak count of six recorded on the second visit in March.

Eider, Long-tailed Duck, Mallard, Red-Breasted Merganser, Teal and Wigeon
Although no breeding records were confirmed for eider (*Somateria mollissima*) a peak count of 60 individuals was recorded in the sea around the island during the April breeding bird walkover survey. Eider were recorded in small numbers (peak count 12) around the island during each of the visits as were long-tailed duck (*Clangula hyemalis*) (2), red-breasted merganser (*Mergus serrator*) (4), teal (*Anas crecca*) (19) and wigeon (*Anas penelope*) (130).

Seabirds, Skuas and Gulls

Arctic Tern
Arctic tern was recorded three times, totalling 15 individuals, during VP surveys (Annex A: Table A6; Figure 7.14). A peak of 15 incubating individuals were recorded in late May, with 13 located on the beach in the southeast of the island, although it is thought all nests failed (Figure 7.14).

Black Guillemot
Black guillemot were not recorded from VP surveys but an all island count undertaken twice identified a maximum figure of 299 adult birds within 300m of the shoreline on 30th April. The birds were recorded in an even spread round the whole island coastline, indicating suitable breeding habitat in boulders and cliffs for this species round much of the island. Black guillemot were also recorded in small numbers in the sea around the island during each winter walkover survey visit.

Fulmar
Fulmars were recorded 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).

Great Skua
26 flights of individual great skua were recorded during the VP surveys (Annex A: Table A10; Figure 7.14) while the breeding bird walkover survey identified a single breeding territory in the south of the island for this species (Figure 7.14). The total flight time recorded was 1,400 seconds, of which 457 seconds was recorded below 10m and the remaining 943 recorded between 10-150m. A large number of flights involved individuals following the coastline of the island.

Arctic Skua
Arctic skua were recorded once from VP surveys in August (Annex A: Table A5; Figure 7.14) and breeding bird walkover surveys identified a single possible territory noted on the Holm of Faray.

Shag
Shag were recorded occasionally from VP surveys while a full island count on 30th May identified 162 AON's, with the majority of nest noted on the west coast cliffs (Figure 7.9). In addition to the 162 AON's, 145 loafing or juvenile birds were recorded around the island edges. Shags were recorded on cliffs, in particular along the west coast of the island during each visit of the wintering bird walkover survey, peaking at 132 on the third visit.

Storm Petrel

Storm petrels were not recorded from VP surveys however a total of 91 apparently occupied sites (AOSs) were recorded during dedicated storm petrel callback surveys in June 2019 and a total of 87 AOS's were counted during the calibrated callback survey in July 2020 (Figure 7.11). Storm Petrel nocturnal celiometry surveys were undertaken in July and August 2019 and July 2020 and full details of the results are outlined in a dedicated report (Appendix 7.3) completed by ITPE (2019).

Gulls

Common gull, great black-backed gull, herring gull, lesser black-backed gull and a single Iceland gull (Larus glaucoides) were all recorded during VP surveys.

A total of 17 common gull AON's were recorded (a single record during the cliff count and 16 recorded breeding on the island top); a total of 32 great black-backed gull AON's (18 on cliffs and 14 on the island top); and 96 herring gull AON's (five on cliffs and 91 on the island top), see Figure 7.12 for gull AON locations.

Other Species

A number of passerine species were recorded as breeding on the island, including skylark (Alauda arvensis), wren (Troglodytes troglodytes), meadow pipit (Anthus pratensis), twite (Linaria flavirostris), rock pipit (Anthus petrosus), pied wagtail (Motacilla alba), swallow (Hirundo rustica), linnet (Carduelis cannabina) and rock dove (Columba livia).

Guillemot and razorbill (Alca torda) were both recorded in small numbers in the seas around the island during wintering bird surveys.

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Annex A: Ornithological Data

Table A1 - Vantage point survey timings and weather

Date	Vantage Point	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
29-Apr-19	1	12:15	15:15	3	SE	4	3	0	0	0
29-Apr-19	1	15:45	18:45	3	SE	4	1	0	0	0
30-Apr-19	2	12:30	15:30	3	SE	3	5	0	0	0
30-Apr-19	2	16:00	19:00	3	S	3	4	0	0	0
30-May-19	1	13:30	16:30	3	NW	4	4	0	0	0
30-May-19	1	17:00	20:00	3	W	3	6	0	0	0
01-Jun-19	2	14:00	17:00	3	WSW	3	6	0	0	0
01-Jun-19	2	17:30	20:30	3	WSW	3	8	1	0	0
25-Jun-19	1	14:30	17:30	3	N	4	7	0	0	0
25-Jun-19	1	18:00	21:00	3	N	4	8	0	0	0
26-Jun-19	2	13:00	16:00	3	WNW	5	8	0	0	0
26-Jun-19	2	16:30	19:30	3	W	5	8	0	0	0
27-Jun-19	1	16:30	19:30	3	WNW	3	8	0	0	0
25-Jul-19	1	11:45	14:45	3	SE	4	3	0	0	0
25-Jul-19	1	15:15	18:15	3	SSE	4	1	0	0	0
25-Jul-19	2	18:45	21:45	3	SSE	4	2	0	0	0
26-Jul-19	2	12:20	15:20	3	SSE	4	5	0	0	0
26-Jul-19	2	15:50	18:50	3	SE	4	7	0	0	0
25-Aug-19	2	13:00	16:00	3	SE	3	8	0	0	0
25-Aug-19	2	16:30	19:30	3	SSE	4	7	0	0	0
26-Aug-19	1	11:00	14:00	3	SE	3	5	0	0	0
26-Aug-19	1	14:30	17:30	3	SE	3	4	0	0	0
27-Aug-19	2	13:10	16:10	3	SE	1	6	0	0	0
27-Aug-19	1	13:10	16:10	3	SE	1	6	0	0	0
02-Sep-19	1	17:05	20:05	3	SE	2	7	0	0	0

Date	Vantage Point	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
02-Sep-19	2	17:05	20:05	3	SE	2	7	0	0	0
03-Sep-19	1	12:55	15:55	3	S	3	6	0	0	0
03-Sep-19	2	12:55	15:55	3	S	3	6	0	0	0
01-Sep-19	1	09:30	12:30	3	S	5	5	1	0	0
01-Sep-19	2	13:00	16:00	3	S	5	7	1	0	0
25-Feb-20	2	10:00	13:00	3	SW	2	7	0	0	0
25-Feb-20	2	13:45	15:45	2	SW	6	5	0	0	0
26-Feb-20	1	07:15	10:15	3	W	4	8	3	0	0
26-Feb-20	1	14:30	17:30	3	W	5	8	1	0	0
27-Feb-20	1	07:00	10:00	3	SW	5	6	3	0	0
27-Feb-20	2	10:30	11:30	1	SW	5	6	0	0	0
19-Mar-20	1	07:35	10:35	3	WNW	3	4	0	0	0
19-Mar-20	2	07:35	10:35	3	WNW	3	4	0	0	0
19-Mar-20	1	11:10	14:10	3	W	3	3	0	0	0
19-Mar-20	2	11:10	14:10	3	W	3	3	0	0	0
19-Mar-20	1	14:45	17:45	3	W	3	2	0	0	0
19-Mar-20	2	14:45	17:45	3	W	3	2	0	0	0
20-Mar-20	2	06:20	09:20	3	NNE	3	8	0	0	0
20-Mar-20	1	09:50	12:50	3	E	1	7	0	0	0
21-Mar-20	1	07:15	10:15	3	S	4	7	0	0	0
21-Mar-20	2	07:15	10:15	3	S	4	7	0	0	0
21-Mar-20	1	10:45	13:45	3	S	4	8	0	0	0
21-Mar-20	2	10:45	13:45	3	S	4	8	0	0	0
21-Mar-20	2	15:45	18:30	2	S	5	8	0	0	0

Meteorological Key:

Wind speed	Cloud cover	Rain	Snow	Frost
calm = 0 light air = 1 Light breeze = 2	In eighths e.g 0/8 = no cloud 8/8 = full cloud cover	None = 0 Occasional=1 Drizzle / mist = 2	None = 0 On Site = 1 Snowing = 2	None = 0 Ground = 1 All day = 2

Date	Vantage Point	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
Gentle Breeze = 3 Mod. Breeze = 4 fresh breeze = 5 strong breeze = 6 mod. gale = 7 fresh gale = 8 strong gale = 9				Light shower = 3 Heavy shower = 4 Heavy rain = 5						

Table A2 - Vantage Point Survey: Breeding / Non-Breeding Season Species List

Breeding Season	Non-breeding Season
Herring gull	Herring gull
Lesser black-backed gull	Kestrel
Curlew	Lesser black-backed gull
Hen harrier	Curlew
Lapwing	Hen harrier
Oystercatcher	Lapwing
Raven	Oystercatcher
Golden plover	Raven
Greylag goose	Golden plover
Fulmar	Greylag goose
Redshank	Fulmar
Great black-backed gull	Black-headed gull
Ringed Plover	Redshank
Red-throated diver	Mallard
Great skua	Great black-backed gull
Arctic tern	Merlin
Snipe	Sparrowhawk
Dunlin	Ringed Plover
Shag	Red-throated diver
Gannet	Great skua
Turnstone	Snipe

Breeding Season	Non-breeding Season
	Dunlin
	Shag
	Gannet
	Turnstone
	Arctic skua
	Cormorant
	Grey heron
	Wigeon
	Iceland gull
	Whooper Swan
	Eider
	Peregrine
	Hooded crow
	Rock dove
	Jackdaw
	Teal
	Pink-footed Goose
	Black guillemot

Table A3 - Vantage Point Survey: Flight Activity Expressed as Percentage Occurrence

Species	Target or Secondary	Percentage Occurrence
Arctic skua	Target	0.06%
Arctic tern	Target	0.17%
Black guillemot	Secondary	0.12%
Black-headed gull	Secondary	0.41%
Common gull	Secondary	5.24%
Cormorant	Secondary	1.75%
Curlew	Target	2.27%

Species	Target or Secondary	Percentage Occurrence
Dunlin	Target	0.12%
Eider	Secondary	0.29%
Fulmar	Secondary	14.74%
Gannet	Secondary	0.87%
Golden plover	Target	1.75%
Great black-backed gull	Secondary	8.04%
Great skua	Target	1.57%
Grey heron	Secondary	0.29%
Greylag goose	Target	2.80%
Hen harrier	Target	0.41%
Herring gull	Secondary	10.61%
Hooded crow	Secondary	0.76%
Iceland gull	Secondary	0.93%
Jackdaw	Secondary	0.06%
Kestrel	Secondary	0.06%
Lapwing	Target	7.98%
Lesser black-backed gull	Secondary	0.23%
Mallard	Secondary	0.06%
Merlin	Target	0.23%
Oystercatcher	Target	3.55%
Peregrine	Target	0.17%
Pink-footed Goose	Target	0.06%
Raven	Secondary	4.72%
Redshank	Target	1.17%
Red-throated diver	Target	0.93%
Ringed Plover	Target	0.29%
Rock dove	Secondary	0.17%
Shag	Secondary	0.41%

Species	Target or Secondary	Percentage Occurrence
Snipe	*Target*	*0.82%*
Sparrowhawk	*Secondary*	*0.29%*
Teal	*Secondary*	*0.06%*
Turnstone	*Target*	*0.23%*
Whooper Swan	*Target*	*0.12%*
Wigeon	*Secondary*	*0.41%*

Table A4 - Summary of Target Species Flight Time

Species	No Individuals	Sum of Duration (Seconds)	Sum HB1 (<10m)	Sum HB2 PCH (10 ≥ < 150 m)	Sum HB3 (150m +)
Arctic skua	1	55	0	55	0
Arctic tern	15	459	384	75	0
Curlew	34	1106	442	664	0
Dunlin	1	50	0	50	0
Golden plover	309	819	275	456	88
Great skua	26	1400	457	943	0
Greylag goose	233	2319	807	1447	125
Hen harrier	7	456	391	65	0
Lapwing	443	7852	5478	2272	115
Merlin	15	92	82	10	0
Oystercatcher	117	2027	1197	846	0
Peregrine	3	479	5	474	0
Pink-footed goose	1	60	0	80	0
Redshank	15	198	155	43	0
Red-throated diver	10	650	110	540	0
Ringed plover	7	40	10	30	0

Snipe	15	878	20	858	0
Turnstone	10	134	40	94	0
Whooper swan	4	45	0	45	0

Table A5 - *Flight Time: Arctic skua*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
02-Sep-19	1	1	U	18:57	55	0	55	0

Table A6 - *Flight Time: Arctic tern*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
30-May-19	1	10	U	17:37	214	214	0	0
25-Jun-19	1	2	U	20:25	97	67	30	0
27-Jun-19	1	3	U	17:47	148	103	45	0

Table A7 - *Flight Time: Curlew*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
29-Apr-19	1	2	U	15:06	28	14	14	0
30-Apr-19	2	2	U	18:06	37	37	0	0
30-Apr-19	2	1	U	18:46	49	49	0	0
30-May-19	1	1	U	13:41	43	0	43	0
25-Jun-19	1	1	U	19:37	27	6	21	0
26-Aug-19	1	1	U	14:55	56	0	56	0
27-Aug-19	2	4	U	13:26	40	0	40	0
01-Sep-19	1	1	U	12:21	18	0	18	0
25-Feb-20	2	1	U	15:25	65	0	65	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	1	1	U	08:30	45	45	0	0
21-Mar-20	2	1	U	10:50	19	19	0	0
21-Mar-20	2	1	U	11:36	35	35	0	0
21-Mar-20	2	1	U	12:19	27	0	27	0
19-Mar-20	2	2	U	09:06	17	17	0	0
19-Mar-20	2	1	U	11:16	30	30	0	0
19-Mar-20	2	2	U	11:44	30	30	0	0
19-Mar-20	2	2	U	11:45	45	45	0	0
19-Mar-20	2	1	U	11:45	300	57	243	0
19-Mar-20	2	2	U	12:49	15	15	0	0
19-Mar-20	2	1	U	16:54	30	10	20	0
20-Mar-20	2	2	U	06:28	15	15	0	0
20-Mar-20	2	1	U	06:37	40	0	40	0
20-Mar-20	2	1	U	07:47	90	13	77	0
21-Mar-20	2	1	U	12:43	5	5	0	0

Table A8 - *Flight Time: Dunlin*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
26-Feb-20	1	1	U	09:34	50	0	50	0

Table A9 - *Flight Time: Golden plover*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
30-May-19	1	2	U	14:18	18	18	0	0
01-Jun-19	2	2	U	16:51	23	23	0	0
01-Jun-19	2	1	U	18:34	33	33	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
01-Jun-19	2	1	U	18:57	18	18	0	0
26-Jun-19	2	2	U	19:03	12	12	0	0
02-Sep-19	1	33	U	19:36	125	0	60	65
02-Sep-19	1	4	U	17:39	11	11	0	0
02-Sep-19	1	4	U	17:59	49	9	40	0
02-Sep-19	1	7	U	19:36	37	37	0	0
01-Sep-19	2	57	U	15:44	64	32	32	0
01-Sep-19	2	34	U	15:52	8	8	0	0
01-Sep-19	2	4	U	15:56	14	14	0	0
01-Sep-19	2	21	U	15:59	18	15	3	0
25-Feb-20	2	43	U	10:13	53	0	30	23
25-Feb-20	2	17	U	10:26	96	45	51	0
25-Feb-20	2	1	U	12:53	40	0	40	0
26-Feb-20	1	21	U	09:34	50	0	50	0
27-Feb-20	2	9	U	11:04	48	0	48	0
19-Mar-20	2	25	U	13:55	15	0	15	0
19-Mar-20	2	20	U	16:40	27	0	27	0
21-Mar-20	1	1	U	09:50	60	0	60	0

Table A10 - *Flight Time: Great skua*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
30-Apr-19	2	1	U	16:47	73	43	30	0
30-May-19	1	1	U	14:57	23	23	0	0
30-May-19	1	1	U	15:13	19	19	0	0
01-Jun-19	2	1	U	15:19	68	68	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
01-Jun-19	2	1	U	15:49	56	56	0	0
26-Jun-19	2	1	U	18:15	61	37	24	0
25-Jul-19	1	1	U	14:02	39	39	0	0
25-Jul-19	1	1	U	14:35	27	27	0	0
26-Jul-19	2	1	U	17:28	31	0	31	0
27-Aug-19	2	1	U	14:23	90	0	90	0
27-Aug-19	2	1	U	15:46	90	60	30	0
27-Aug-19	1	1	U	14:27	34	0	34	0
27-Aug-19	1	1	U	15:11	132	0	132	0
02-Sep-19	1	1	U	17:42	44	0	44	0
02-Sep-19	1	1	U	18:23	65	0	65	0
02-Sep-19	1	1	U	18:30	33	0	33	0
03-Sep-19	2	1	U	13:22	105	0	105	0
03-Sep-19	2	1	U	14:48	35	0	35	0
03-Sep-19	2	1	U	14:54	120	0	120	0
03-Sep-19	2	1	U	15:44	30	30	0	0
03-Sep-19	2	1	U	15:52	95	0	95	0
03-Sep-19	2	1	U	14:29	22	22	0	0
03-Sep-19	2	1	U	15:18	14	0	14	0
03-Sep-19	2	1	U	15:47	23	12	11	0
01-Sep-19	1	1	U	09:58	29	0	29	0
01-Sep-19	1	1	U	11:12	42	21	21	0

Table A11 - *Flight Time: Greylag goose*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
29-Apr-19	1	4	U	13:12	36	16	20	0
29-Apr-19	1	2	U	15:58	33	33	0	0
30-May-19	1	2	U	18:14	70	0	70	0
01-Jun-19	2	2	U	14:28	63	0	63	0
01-Jun-19	2	4	U	17:44	49	0	49	0
26-Jun-19	2	2	U	13:32	74	0	74	0
27-Jun-19	1	7	U	16:54	62	0	62	0
27-Jun-19	1	1	U	18:45	10	10	0	0
25-Jul-19	1	3	U	12:38	23	20	3	0
26-Jul-19	2	47	U	12:49	39	0	39	0
02-Sep-19	1	32	U	18:20	80	0	0	80
02-Sep-19	1	19	U	18:28	120	0	120	0
26-Feb-20	1	3	U	07:32	35	35	0	0
26-Feb-20	1	7	U	07:35	60	0	60	0
26-Feb-20	1	8	U	07:40	45	0	0	45
26-Feb-20	1	3	U	08:48	50	0	50	0
27-Feb-20	1	7	U	07:07	65	10	55	0
27-Feb-20	1	2	U	08:45	60	0	60	0
19-Mar-20	1	2	U	07:49	60	24	36	0
19-Mar-20	1	2	U	07:49	60	24	36	0
19-Mar-20	1	4	U	09:09	60	0	60	0
19-Mar-20	1	2	U	10:03	60	60	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	2	4	U	15:09	39	39	0	0
19-Mar-20	2	18	U	17:12	193	20	173	0
19-Mar-20	2	5	U	17:32	46	9	37	0
20-Mar-20	1	4	U	10:00	70	14	56	0
20-Mar-20	1	2	U	10:03	60	0	60	0
20-Mar-20	1	2	U	10:03	45	0	45	0
20-Mar-20	1	3	U	10:34	65	26	39	0
21-Mar-20	1	1	U	07:45	25	25	0	0
21-Mar-20	1	2	U	08:45	105	53	52	0
21-Mar-20	1	2	U	08:58	10	10	0	0
19-Mar-20	2	2	U	07:49	140	98	42	0
19-Mar-20	2	2	U	12:16	30	30	0	0
19-Mar-20	2	2	U	12:29	90	90	0	0
19-Mar-20	2	2	U	13:22	20	20	0	0
20-Mar-20	2	2	U	07:21	20	20	0	0
21-Mar-20	2	4	U	08:14	19	19	0	0
21-Mar-20	2	2	U	08:45	49	25	24	0
21-Mar-20	2	2	U	08:56	64	51	13	0
21-Mar-20	2	2	U	16:25	65	26	39	0
21-Mar-20	2	5	U	18:27	10	0	10	0

T Table A12 - ***Flight Time: Hen harrier***

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
27-Aug-19	2	1	F	14:00	15	15	0	0
02-Sep-19	1	1	F	18:01	40	40	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
02-Sep-19	1	1	F	19:13	31	0	31	0
01-Sep-19	2	1	Juv/f	13:13	34	0	34	0
26-Feb-20	1	1	M	15:20	28	28	0	0
26-Feb-20	1	1	M	15:31	125	125	0	0
21-Mar-20	2	1	M	12:46	183	183	0	0

Table A13 - *Flight Time: Lapwing*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
29-Apr-19	1	1	U	16:38	40	5	35	0
29-Apr-19	1	2	U	17:32	59	0	59	0
30-Apr-19	2	2	U	14:34	79	79	0	0
30-Apr-19	2	2	U	15:27	130	130	0	0
30-Apr-19	2	3	U	16:54	58	58	0	0
30-May-19	1	5	U	17:07	278	208	70	0
01-Jun-19	2	3	U	14:44	41	26	15	0
01-Jun-19	2	1	U	20:14	21	21	0	0
25-Jun-19	1	2	U	17:06	144	39	105	0
26-Jun-19	2	3	U	14:26	192	87	105	0
26-Jun-19	2	1	U	16:31	22	22	0	0
27-Jun-19	1	2	U	17:21	96	6	90	0
25-Jul-19	2	2	U	20:03	18	9	9	0
26-Jul-19	2	2	U	13:14	27	7	20	0
02-Sep-19	1	26	U	17:40	102	0	55	65
02-Sep-19	1	7	U	17:40	110	0	55	50

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
02-Sep-19	1	33	U	17:38	121	0	121	0
01-Sep-19	2	48	U	13:14	67	33	34	0
01-Sep-19	2	37	U	15:55	91	50	41	0
01-Sep-19	2	38	U	15:56	30	15	15	0
01-Sep-19	2	62	U	15:59	21	21	0	0
25-Feb-20	2	4	U	15:03	95	30	65	0
19-Mar-20	1	2	U	07:35	30	15	15	0
19-Mar-20	1	3	U	07:41	210	188	22	0
19-Mar-20	1	3	U	07:53	30	10	20	0
19-Mar-20	1	2	U	08:41	75	25	50	0
19-Mar-20	1	1	U	09:14	15	8	7	0
19-Mar-20	2	2	U	11:32	86	71	15	0
19-Mar-20	2	2	U	11:59	146	146	0	0
19-Mar-20	2	2	U	14:55	53	53	0	0
19-Mar-20	2	2	U	14:58	45	45	0	0
19-Mar-20	2	2	U	15:18	145	145	0	0
19-Mar-20	2	3	U	15:33	45	45	0	0
19-Mar-20	2	2	U	15:56	36	36	0	0
19-Mar-20	2	4	U	16:06	27	27	0	0
19-Mar-20	2	1	U	16:08	19	0	19	0
19-Mar-20	2	2	U	17:04	125	125	0	0
19-Mar-20	2	2	U	17:27	50	50	0	0
20-Mar-20	1	1	U	09:51	30	0	30	0
21-Mar-20	2	1	U	13:25	15	7	8	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
21-Mar-20	1	1	U	08:49	10	0	10	0
21-Mar-20	1	1	U	09:40	120	27	93	0
19-Mar-20	2	1	U	07:41	88	73	15	0
19-Mar-20	2	1	U	07:45	110	110	0	0
19-Mar-20	2	3	U	07:52	35	0	35	0
19-Mar-20	2	1	U	08:02	19	19	0	0
19-Mar-20	2	1	U	08:11	14	14	0	0
19-Mar-20	2	5	U	08:14	71	57	14	0
19-Mar-20	2	1	U	08:18	49	49	0	0
19-Mar-20	2	2	U	08:24	133	133	0	0
19-Mar-20	2	2	U	08:38	52	52	0	0
19-Mar-20	2	2	U	09:24	17	17	0	0
19-Mar-20	2	1	U	10:01	18	18	0	0
19-Mar-20	2	3	U	10:26	125	97	28	0
19-Mar-20	2	3	U	11:13	60	60	0	0
19-Mar-20	2	6	U	11:14	180	138	42	0
19-Mar-20	2	1	U	11:34	15	15	0	0
19-Mar-20	2	5	U	12:24	30	10	20	0
19-Mar-20	2	2	U	12:34	15	15	0	0
19-Mar-20	2	1	U	12:53	30	30	0	0
19-Mar-20	2	1	U	13:11	15	8	7	0
19-Mar-20	2	2	U	13:58	30	30	0	0
19-Mar-20	2	4	U	14:59	30	30	0	0
19-Mar-20	2	1	U	15:16	30	10	20	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	2	8	U	15:34	330	330	0	0
19-Mar-20	2	1	U	15:48	30	30	0	0
19-Mar-20	2	1	U	16:05	20	20	0	0
20-Mar-20	2	1	U	06:45	690	597	93	0
20-Mar-20	2	1	U	06:51	50	50	0	0
20-Mar-20	2	1	U	07:45	50	50	0	0
20-Mar-20	2	10	U	07:52	750	639	111	0
20-Mar-20	2	7	U	08:12	330	318	12	0
21-Mar-20	2	2	U	07:36	49	25	24	0
21-Mar-20	2	1	U	07:42	89	45	44	0
21-Mar-20	2	2	U	07:45	145	58	87	0
21-Mar-20	2	1	U	07:56	254	90	164	0
21-Mar-20	2	5	U	08:27	192	103	89	0
21-Mar-20	2	1	U	08:48	53	40	13	0
21-Mar-20	2	3	U	09:14	138	83	55	0
21-Mar-20	2	1	U	09:43	50	25	25	0
21-Mar-20	2	2	U	09:55	127	99	28	0
21-Mar-20	2	2	U	10:07	15	8	7	0
21-Mar-20	2	2	U	13:12	20	0	20	0
21-Mar-20	2	1	U	13:42	30	0	30	0
21-Mar-20	2	16	U	17:43	120	14	106	0

Table A14 - *Flight Time: Merlin*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	1	1	F	09:07	5	5	0	0
19-Mar-20	2	12	Juv/f	14:52	12	12	0	0
20-Mar-20	1	1	F	11:28	60	50	10	0
21-Mar-20	2	1	Juv/f	09:31	15	15	0	0

Table A15 - Flight Time: Oystercatcher

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
29-Apr-19	1	2	U	12:28	22	22	0	0
30-Apr-19	2	2	U	13:27	24	12	12	0
30-May-19	1	5	U	19:45	133	0	133	0
30-May-19	1	1	U	19:54	16	16	0	0
01-Jun-19	2	2	U	17:56	23	23	0	0
01-Jun-19	2	4	U	17:58	114	84	30	0
01-Jun-19	2	4	U	18:08	162	162	0	0
01-Jun-19	2	1	U	19:36	14	14	0	0
01-Jun-19	2	3	U	19:41:00	51	51	0	0
25-Jun-19	1	2	U	14:43	32	17	15	0
25-Jun-19	1	8	U	18:03	58	8	50	0
25-Jun-19	1	1	U	18:40	24	0	24	0
25-Jun-19	1	2	U	18:54	82	62	30	0
26-Jun-19	2	7	U	15:50	93	63	30	0
26-Jun-19	2	2	U	17:52	49	49	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
26-Jun-19	2	1	U	17:58	37	37	0	0
26-Jun-19	2	4	U	18:17	24	24	0	0
26-Jun-19	2	2	U	18:49	18	18	0	0
27-Jun-19	1	1	U	18:23	47	47	0	0
25-Jul-19	1	5	U	14:41	31	0	37	0
25-Jul-19	1	2	U	16:55	27	0	27	0
25-Jul-19	2	7	U	19:17	42	0	42	0
25-Jul-19	2	5	U	20:05	38	23	15	0
25-Jul-19	2	9	U	21:12	74	15	59	0
26-Jul-19	2	1	U	13:58	8	8	0	0
27-Aug-19	2	1	U	13:24	25	25	0	0
25-Feb-20	2	1	U	12:50	30	15	15	0
19-Mar-20	2	3	U	11:54	48	36	12	0
19-Mar-20	2	1	U	15:30	30	30	0	0
20-Mar-20	1	1	U	11:06	95	68	27	0
20-Mar-20	1	1	U	11:44	120	0	120	0
20-Mar-20	1	2	U	12:41	35	35	0	0
21-Mar-20	2	2	U	11:28	45	45	0	0
21-Mar-20	1	2	U	07:31	45	30	15	0
21-Mar-20	1	1	U	08:20	20	20	0	0
19-Mar-20	2	2	U	09:55	8	8	0	0
19-Mar-20	2	1	U	11:18	30	30	0	0
19-Mar-20	2	2	U	11:21	45	45	0	0
19-Mar-20	2	1	U	13:59	15	15	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
20-Mar-20	2	2	U	08:02	5	5	0	0
20-Mar-20	2	1	U	09:15	50	0	50	0
21-Mar-20	2	2	U	11:14	10	10	0	0
21-Mar-20	2	4	U	12:04	30	0	30	0
21-Mar-20	2	2	U	12:33	10	10	0	0

Table A16 - *Flight Time: Peregrine*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	2	1	U	12:03	469	0	469	0
19-Mar-20	2	1	U	09:12	5	0	5	0
21-Mar-20	2	1	U	17:42	5	5	0	0

Table A17 - *Flight Time: Pink-footed goose*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
20-Mar-20	2	1	U	07:09	60	0	80	0

Table A18 - *Flight Time: Redshank*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
25-Jul-19	1	2	U	15:37	14	7	7	0
25-Jul-19	1	1	U	17:32	11	11	0	0
26-Feb-20	1	1	U	09:40	20	20	0	0
27-Feb-20	1	1	U	08:05	15	15	0	0
19-Mar-20	2	1	U	10:20	22	22	0	0

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	2	1	U	11:34	15	15	0	0
20-Mar-20	2	1	U	07:23	5	5	0	0
20-Mar-20	2	3	U	07:54	5	5	0	0
21-Mar-20	2	1	U	07:24	30	20	10	0
21-Mar-20	2	1	U	07:41	35	23	12	0
21-Mar-20	2	1	U	12:09	5	5	0	0

Table A19 - *Flight Time: Red-throated diver*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
30-Apr-19	2	2	U	12:48	93	0	93	0
30-Apr-19	2	1	U	15:22	112	0	112	0
30-Apr-19	2	1	U	18:18	134	0	134	0
30-May-19	1	1	U	13:59	58	0	58	0
01-Jun-19	2	1	U	16:20	71	0	71	0
26-Aug-19	1	1	U	14:50	72	0	72	0
25-Feb-20	2	1	U	10:57	30	30	0	0
21-Mar-20	1	1	U	07:55	20	20	0	0
20-Mar-20	2	1	U	07:00	60	60	0	0

Table A20 - *Flight Time: Ringed plover*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	2	1	U	15:53	30	0	30	0
20-Mar-20	2	6	U	08:22	10	10	0	0

Table A21 - *Flight Time: Snipe*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
30-May-19	1	1	U	18:26	208	0	208	0
30-May-19	1	4	U	19:50	240	0	240	0
25-Jun-19	1	2	U	18:56	89	0	89	0
27-Aug-19	2	1	U	13:49	10	10	0	0
02-Sep-19	1	1	U	19:06	30	0	30	0
02-Sep-19	1	2	U	18:34	224	0	224	0
02-Sep-19	1	1	U	18:37	45	0	45	0
02-Sep-19	1	1	U	19:07	12	0	12	0
19-Mar-20	2	1	U	09:49	10	10	0	0
21-Mar-20	2	1	U	12:40	10	0	10	0

Table A22 - *Flight Time: Turnstone*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
27-Aug-19	2	2	U	15:40	40	0	40	0
27-Aug-19	1	1	U	15:39	54	0	54	0
19-Mar-20	2	5	U	11:48	10	10	0	0
20-Mar-20	2	2	U	07:23	30	30	0	0

Table A23 - *Flight Time: Whooper swan*

Date	VP	Qty.	Sex	Time of Flight	Duration	Time HB1	Time HB2	Time HB3
19-Mar-20	1	2	U	08:12	30	0	30	0
19-Mar-20	2	2	U	08:12	15	0	15	0