ESB

Carnsore Windfarm Summer Bird Report 2020

602677 (01)

MARCH 2021

RSK GENERAL NOTES

Project No.: 602677 (01)

Title: Carnsore Windfarm Summer Bird Report 2020

Client: ESB

Date: 12 March 2021

Office: Dublin

Status: Final

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Date:	12/03/2021	Date:	12/03/2021

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

Project background

1.1 Scott Cawley were commissioned by RSK on behalf of ESB Ireland to undertake summer bird surveys at the operational Carnsore Windfarm located at Carnsore Point, County Wexford. Summer bird surveys completed between April and September 2020 have been undertaken to inform the proposed repowering development of the currently operational Carnsore Windfarm.

1.2 This report presents the survey methodology and the survey results of summer bird surveys undertaken between April and September 2020, a summary and recommendations to be considered in the proposed development design.

Existing environment

1.3 Carnsore Wind Farm (hereafter referred to as 'the site') is located at Carnsore Point, County Wexford. The site contains fourteen turbines located on improved agricultural grassland with a sand dune system to the south. To the east of the site is the Irish Sea and to the south is the Atlantic Ocean.

1.4 Habitats within the site include mostly agricultural fields grazed by livestock, hedgerows forming field boundaries and areas of scattered bramble and gorse scrub throughout the site, with a larger area dominated by scrub in the west of the site.

Statement of authority

1.5 Surveys were carried out by Caroline Kelly and Maeve Maher-McWilliams of Scott Cawley Ltd. The report was authored by Lorna Gill of Scott Cawley Ltd. The report has been reviewed for quality assurance purposes by Dr Niamh Burke of Coiscéim Ecology and Maeve Maher-McWilliams Principal Ecologist of Scott Cawley Ltd.

1.6 Caroline Kelly holds an honours degree in Environmental Biology, from University College Dublin (UCD) and a Masters in Applied Ecological Assessment from University College Cork (UCC). She is a Senior Ecologist at Scott Cawley, having worked at the company since 2015.. With respect to bird surveys, Caroline has experience in a range of different survey types including breeding bird surveys (including raptors), vantage point (VP) surveys (including hen harrier breeding/ roosting surveys), wintering bird surveys and targeted species surveys (e.g. surveys for Light-bellied Brent Goose).

1.7 Lorna Gill is a Consultant Ecologist with Scott Cawley. Lorna holds an MSc in Conservation and Biodiversity from the University of Exeter and an honours degree in Natural Sciences with a specialisation in Zoology from Trinity College Dublin. Lorna is experienced in carrying out field surveys in Ireland including wintering birds and breeding birds.

1.8 Niamh Burke is Principal Ecologist with Coiscéim Ecology. She holds a BSc in Natural Sciences with Environmental Science and a PhD in salmonid ecology. She is a Chartered

Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Niamh is a senior scientist with academic research and consulting experience in terrestrial ecology, aquatic ecology and fluvial geomorphology. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation, both national and European. With a specialism in aquatic habitats, she also has experience of terrestrial species' surveys and mitigation approaches. In her extensive consultancy roles she has acted as reviewer for all ecological reporting and ensured consistency of standards and approach.

1.9 Maeve Maher-McWilliams is a Principal Ecologist with Scott Cawley and is an Associate member of CIEEM. She holds a Masters in Evolutionary and Behavioural Ecology from University of Exeter and an honours degree in Biological Sciences from Queens University Belfast. Maeve has worked in ecological consultancy for over eight years and has worked on a range of large to small scale projects across Ireland and the UK. Maeve's primary technical specialism is ornithology; however, her skills extend to protected mammal and habitat surveys.

2 METHODOLOGY

2.1 The surveys reported herein were carried out between April and September 2020 and covered one summer or breeding bird season. The survey methodology follows Scottish Natural Heritage (SNH) guidance: *Assessing the impact of repowered wind farms in nature* (*Consultation draft)* (SNH 2018), and *Recommended bird survey methods to inform impact assessment of onshore wind farms* (SNH 2017).

2.2 Bird surveys for repowering developments are approached differently to proposed new wind farms on undeveloped sites. The baseline collected on a site with an existing operational wind farm may skew results of standard surveys intended for undeveloped sites. Displacement of birds from the site due to the presence of the operating wind farm will possibly distort bird activity within the site. As such surveys have been adapted accordingly and are presented below.

Desk Study

2.3 A desk study was undertaken to collate available information on the local ornithological environment. The desk study has been presented in the Carnsore Windfarm Winter Bird Report 2019-2020 (Scott Cawley, 2020).

Vantage point survey

2.4 Vantage point (VP) surveys were undertaken using an adapted standard methodology as described in SNH (2017) to provide data for the assessment of flight activity of target species within the site. The VP survey area was defined as the area within the site, based on the boundary provided by ESB, including a 500m buffer around the site boundary (Figure 1).

2.5 Two VP locations within the site were identified at VP1 711772, 604442 (ITM) and VP2 711731, 604561 (ITM).

2.6 Based on the results of the desktop study a list of target species were identified. Target species included those listed as:

- Annex I of the Directive 2009/147/EEC referred to as the Birds Directive
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within the vicinity of the site
- Species protected under the fourth schedule of the Wildlife Acts 1976-2019 which are all raptors that occur in Ireland with the exception of buzzards, as explained below
- Red and amber listed Birds of Conservation Concern in Ireland (BoCCI) species with the exception of passerines

2.7 Secondary species included:

- Red and Amber listed BoCCI passerine species in notable numbers
- Raven
- Green listed raptor species which were not listed on Annex I (i.e. buzzard)

- Gull species, in this case due to the location of the site gull flight lines over the coastline and within the VP survey area were too numerous to record as target species therefore they were recorded as secondary species
- As for above due the location of the site, gannet flight lines over the sea but within the VP survey area were too numerous to record therefore they were recorded as target species therefore they were recorded as secondary species

2.8 Surveys were considered to follow an adapted methodology of 18 hours of VP surveys, in the format of one three-hour observation per month, undertaken at each VP location between April and September 2020.

2.9 Surveys were carried out at various times of day and were undertaken in a variety of weather conditions, mostly during conditions of at least moderate visibility (1-2 km). Watches usually comprised two sessions of three-hour observations, separated by a break of at least 30 minutes between sessions in order to avoid observer fatigue.

2.10 For each target species flight the following details were recorded:

- Species, age and sex (when identification of age and/or sex was possible);
- Number of birds;
- Time;
- Duration of flight within the survey area;
- Flying height in four defined height bands, corresponding approximately to below Rotor Swept Height (RSH) (0–23m), at RSH (23-75m) and two height bands above RSH (75-100m and >100m, respectively), per 15 second interval;
- Bird behaviour; and
- Reason for end of the flight (either the bird landed or flew out of sight)

2.11 The flight path of each target species recorded was drawn as accurately as possible on to a large-scale map in the field. Each recorded flight path was numbered and cross-referenced to the flight data.

2.12 Secondary species were recorded in five-minute blocks. During each five-minute block of the VP survey, the minimum number of each species and the flight activity observed was recorded, including details of the height band and location of the birds (over the site or 500m buffer).

2.13 The weather conditions and times of each survey are presented in Appendix 1.

Table 1: VP survey dates between April and September 2020

VP location	Date	Time
1	29/04/2020	13:58 – 16:58
	29/05/2020	10:03 – 13:03
	17/06/2020	11:04 – 14:04
	22/07/2020	18:00 – 21:00
	28/08/2020	07:20 – 10:20
	29/09/2020	11:25 – 14:25
2	30/04/2020	07:25 – 10:25
	28/05/2020	18:49 – 21:49
	05/06/2020	11:00 – 14:00
	22/07/2020	14:03 – 17:03
	28/08/2020	10:20 – 13:20
	15/09/2020	07:38 – 10:38

Breeding bird survey

2.14 Breeding bird surveys were undertaken on four visits between April and June 2020 (Table 2). The breeding bird survey area included all land within the site and additional 500m buffer (Figure 1), where accessible.

2.15 A walkover route was surveyed which encompassed all habitat types within the site using a methodology adapted from the Bird Monitoring Methods - *A* Manual of Techniques for Key UK Species *1.* All amber-listed and red-listed BoCCI (Colhoun & Cummins, 2013) were recorded during these surveys and marked on suitably scaled maps in the field. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

2.16 Breeding bird territory analysis was undertaken and territories mapped as possible breeders, probable breeders, or confirmed breeders as per BTO recognised breeding bird behaviour classifications[2].

2.17 The weather conditions and times of each survey are presented in Appendix 2.

[1] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

[2] https://www.bto.org/sites/default/files/u36/downloads/breedingcodes.pdf

Table 2: Breeding bird survey dates

Visit	Date	Time
1	29/04/2020	10:50 – 13:15
2	29/05/2020	07:25 – 10:00
3	05/06/2020	07:15 – 09:50
4	17/06/2020	07:27 – 10:00

3 RESULTS

Desk Study

3.1 The desk study is presented in the Carnsore Windfarm Winter Bird Report 2019-2020 (Scott Cawley, 2020).

Vantage point survey

Target species

3.2 Seventeen target species were recorded during VP summer surveys undertaken between April 2020 and September 2020. Below is an account of the activity of each target species recorded. See Appendix 3 for full details on each target species flight recorded.

Table 3: Monthly peak counts of target species recorded during VP surveys April 2020 to September 2020

Species	Conservation status	Apr	May	Jun	Jul	Aug	Sep
Cormorant	Amber Listed	1	1	1	1	0	1
Shag	Amber Listed	0	1	0	0	1	0
Kestrel	Amber Listed	0	0	0	1	1	1
Osprey	Annex I	0	0	0	0	1	0
Barnacle Goose	Amber Listed	9	0	0	0	0	0
Curlew	Red Listed Annex II	30	0	0	1	20	0
Grey Heron	Green Listed	0	1	0	0	0	0
Grey Plover	Amber Listed	0	0	0	0	3	0
Little Egret	Green Listed Annex I	1	0	0	0	0	0
House Martin	Amber Listed	0	0	0	3	0	4
Sand Martin	Amber Listed	0	0	3	0	0	0
Swallow	Amber Listed	0	0	0	1	0	0
Swift	Amber Listed	0	0	10	1	0	0
Sandwich Tern	Amber Listed Annex I	0	2	3	1	0	0
Common Tern	Amber Listed Annex I	0	0	4	0	0	0
Arctic Tern	Amber Listed Annex I	0	1	0	0	0	0
Roseate Tern	Amber Listed Annex I	0	0	1	0	0	0
Unidentified Tern species	Amber Listed Annex I	0	0	4	1	0	0

3.3 Cormorant *Phalacrocorax carbo* is amber listed in Ireland. Cormorant were observed on a regular basis throughout the survey area over the summer period. Only one individual bird was recorded at a time. 13.6% of cormorant flights occurred at or partially at Rotor Swept Height (RSH) with the majority of flights were recorded below RSH. Partially at RSH means that a proportion of the flight occurred at a height corresponding to RSH. The majority of the flights taking place along the southern boundary of the site over the coast and few along the southern boundary. See Figure 2 for cormorant flight lines.

3.4 Shag *Phalacrocorax aristotelis* is amber listed in Ireland. Two shag flights were recorded during the surveys, one in May and one in August. Both flights pertained to single birds and one flight was partially at RSH. Both flights were recorded in the northern area of the site. See Figure 2 for shag flight lines.

3.5 Kestrel *Falco tinnunculus* is amber listed in Ireland. Kestrel were observed in July, August and September. All flights pertained to single birds either hunting or flying over the site. All flights were recorded within the site. 21.4% of kestrel flights occurred at or partially at RSH. All remaining flights were recorded below RSH. All flights recorded were within the site boundary. See Figure 3 for kestrel flight lines.

3.6 Osprey *Pandion haliaetus* is an Annex I species and are known to pass through Ireland when migrating between their breeding grounds in Scandinavia and Scotland and their winter grounds in Africa. One single female osprey was recorded in August. They passed through the site, flying at RSH and came close to one of the turbines. See Figure 3 for osprey flight lines.

3.7 Barnacle goose *Branta leucopsis* is amber listed in Ireland. Two barnacle geese flights were recorded in April with a peak count of nine individuals recorded. One flight was in the south of the site and the other in the north. Both of these recorded flights occurred at RSH. See Figure 4 for barnacle goose flight lines.

3.8 Curlew *Numenius arquata* is red listed in Ireland. Curlew were observed in April, July and August. A peak count of 30 birds was recorded in April. 22.2% of curlew flights occurred at or partially at RSH. All remaining flights were recorded below RSH. The majority of flights were recorded within the site boundary. See Figure 4 for curlew flight lines.

3.9 Grey heron *Ardea cinerea* is green listed in Ireland and is a SCI species for Wexford Harbour and Slobs SPA. One individual heron was recorded in May, flying at RSH in the southern boundary of the site. See Figure 4 for grey heron flight lines.

3.10 Grey plover *Pluvialis squatarola* is amber listed in Ireland. One grey plover flight was recorded in August, consisting of three individuals flying at RSH in the northern boundary of the site. See Figure 4 for grey plover flight lines.

3.11 Little egret *Egretta garzetta* is green listed in Ireland and is an Annex I species. A single little egret flight consisting of a single bird was recorded in April. The flight was on site and below RSH. See Figure 4 for little egret flight lines.

3.12 House martin *Delichon urbicum* is amber listed in Ireland. House martin were recorded in July and September with a peak count of seven individuals. 33.3% of flights occurred at or partially at RSH with the remainder of flights were recorded below RSH. These flights were recorded around VP2 to the north-west of the site. See Figure 5 for house martin flight lines

3.13 Sand martin *Riparia riparia* is amber listed in Ireland. Two sand martin flights were recorded in June with a peak of three individuals recorded. Both flights were recorded around VP2 to the north-west of the site and occurred partially at RSH. See Figure 5 for sand martin flight lines

3.14 Swallow *Hirundo rustica* is amber listed in Ireland. Three swallow flights pertaining to single birds were recorded in July. These flights occurred within the site boundary toward

the north-west, around both VPs. All of the flights occurred below RSH. See Figure 5 for swallow flight lines

3.15 Swift *Apus apus* is amber listed in Ireland. Four swift flights were recorded in June and July with a peak count of ten individuals recorded in June. 50% of these flights occurred at or partially at RSH. These flights were recorded along the north-western boundary of the site, both on site and off site. See Figure 5 for swift flight lines

3.16 Sandwich tern *Thalasseus sandvicensis* is amber listed in Ireland. Sandwich terns were recorded in May, June and July and were recorded mainly in the northern half of the site. 84.2% of flights occurred at or partially at RSH. Sandwich terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites. See Figure 6 for sandwich tern flight lines.

3.17 Common tern *Sterna hirundo* is amber listed in Ireland. Common terns were recorded in June and were recorded mainly in the northern half of the site. 92.3% of flights occurred at or partially at RSH. These flights predominantly occurred within the site boundary through the middle and north of the site. Common terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites. See Figure 7 for common tern flight lines.

3.18 Arctic tern *Sterna paradisaea* is amber listed in Ireland. Arctic terns were recorded in May, with two flights of an individual bird recorded. Both flights were flying south-east in the northern boundary of the site. One of these flights occurred at Rotor Swept Height (RSH). Arctic terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites. See Figure 8 for Arctic tern flight lines.

3.19 Roseate tern *Sterna dougallii* is amber listed in Ireland. Two roseate tern flights pertaining to single birds were recorded in June flying below RSH. Both flights occurred within the site boundary through the middle and northern areas of the site. Roseate terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites. See Figure 8 for roseate tern flight lines.

3.20 Six flights in June and July were recorded as unidentified tern species. 66.6% of these flights occurred at RSH with a peak count of 4 individuals. They occurred at the southern and northern boundaries of the site, both off site and partially on-site. Flight number 500 was an area noted in addition to those discussed previously. These flights occurred in June during the survey at VP1 as an area of "constant tern activity", with continual flights of unidentified tern species flying back and forth between feeding and breeding grounds with prey an RSH. See Figure 8 for unidentified tern species flight lines.

Secondary species

3.21 Eight secondary species were recorded during VP surveys undertaken between April 2020 and September 2020. Below is an account of activity of secondary species recorded which have been grouped into subdivisions of similar species.

Table 4: Monthly peak counts of secondary species recorded during VP surveys April 2020 to September 2020

Species	Conservation status	Apr	May	Jun	Jul	Aug	Sep
Gannet	Amber Listed	3	0	2	40	6	2
Buzzard	Green Listed	1	1	2	0	1	4
Black-headed Gull	Red Listed	9	13	1	20	35	4
Common Gull	Amber Listed	1	0	0	0	0	0
Lesser Black-backed Gull	Amber Listed	0	1	2	1	0	0
Herring Gull	Red Listed	10	3	3	30	2	3
Great Black-backed Gull	Amber Listed	3	2	2	1	3	1
Starling	Amber Listed	0	0	0	0	0	100

Seabirds

3.22 Black-headed gull *Larus ridibundus* were recorded in every month with a peak count of 35 birds recorded in August. 64.5% of flights were recorded on site with the remaining 35.5% made within the buffer. 92.2% of black-headed gull flights occurred below RSH, while the remaining 7.8% occurred at or partially at RSH.

3.23 A single flight of one individual common gull *Larus canus* was recorded in April. This flight was in the buffer and was below RSH.

3.24 Great black-backed gull *Larus marinus* were recorded in every month with a peak count of 3 birds observed in February. 35.2% of flights were recorded on site or partially on site with the remaining 64.8% made within the buffer. 78% of great black-backed gull flights occurred below RSH, 20% occurred at or partially at RSH while the remaining 2% of flights occurred above RSH.

3.25 Herring gull *Larus argentatus* were recorded in every month with a peak number of 30 birds observed in July. 55.6% of flights were recorded on site or partially on site with the remaining 44.4% made within the buffer. 84.7% of herring gull flights occurred below RSH, 13.9% occurred at or partially at RSH while the remaining 1.4% of flights occurred at above RSH.

3.26 Lesser black-backed gull *Larus fuscus* were recorded in May, June and July with a peak count of 2 birds observed in June. 20% of flights were recorded on site with the remaining 80% made within the buffer. 100% of lesser black-backed gull flights occurred below RSH.

3.27 Gannet *Morus bassanus* were recorded in every month except May. A peak count of 40 birds were observed in July. 100% of flights were recorded within the buffer. Of gannet flights recorded, 75.4% occurred below RSH, 23.2% occurred at or partially at RSH while the remaining 1.4% of flights occurred at above RSH.

Raptors

3.28 Buzzard *Buteo buteo* were recorded in every month except July with a peak count of 4 birds observed in September. 83.7% of flights were recorded on site or partially on site with the remaining 16.3% made within the buffer. Of buzzard flights recorded, 62.8% occurred below RSH, 25.6% occurred at or partially at RSH while the remaining 11.6% of flights occurred at above RSH.

Passerines

3.29 A single starling *Sturnus vulgaris* flight was recorded in September with a peak count of 100 birds. The flight was on site and below RSH.

Breeding bird survey

3.30 A total of 37 species were recorded during the breeding bird surveys, of which 28 are of conservation concern (Annex I, Red and Amber listed species). Generally passerine species including linnet, meadow pipit, stonechat and starling, were recorded in hedgerows, scrub and agricultural fields. Buzzards were recorded on the western side of the site over grassland habitat. Gulls and terns were recorded flying over the site on route between feeding and breeding grounds. Wader species, including oystercatcher, turnstone, dunlin and curlew, were recorded in wet grassland and scrub habitats in the west of the site and along the eastern coastal side of the site.

3.31 The table below presents the breeding status of species recorded during breeding bird surveys and following breeding bird territory analysis. See Figure 9 for mapped breeding bird territories.

Table 5: Monthly peak counts of species recorded during breeding birds walkover surveys April 2020 to September 2020

Species	Conservation status	Breeding status within the site	No. of territories	Comments
Arctic Tern	Amber Listed Annex I	Non-breeding	0	Arctic terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites.
Blackcap	Green Listed	Possible	1	There was one record of a blackcap located at a field boundary on an area of spoil and bare ground.
Black-headed Gull	Red Listed	Non-breeding	0	Recorded flying over the site or feeding within the fields.
Buzzard	Green Listed	Probable	1	Buzzard were recorded flying over the same area to the west of the site on every visit, with a peak count of two birds.
Common Tern	Amber Listed	Non-breeding	0	Common terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites.
Cormorant	Amber Listed	Non-breeding	0	Cormorant were recorded flying or perched along the southern coast of the site
Curlew	Red Listed	Non-breeding	0	Curlew were recorded flying through the western and northern areas of the site or feeding in a field along the east coast.
Dunlin	Red Listed Annex I	Non-breeding	0	Dunlin were recorded flying along the east coast of the site.
Dunnock	Green Listed	Possible	1	A dunnock was recorded once in a field of improved agricultural grassland.
Gannet	Amber Listed	Non-breeding	0	Gannets were recorded flying along the eastern and southern coasts.

Great Black-backed Gull	Amber Listed	Non-breeding	0	Great black-backed gulls were recorded flying along the coast and over the fields of improved agricultural grassland within the site. Additionally, there was 1 great black-backed gull recorded in a field of improved agricultural grassland/dry calcareous and neutral grassland towards the south of the site.
Grey Heron	Green Listed	Non-breeding	0	One heron was recorded hunting along the eastern coastline just outside of the site boundary.
Herring Gull	Red Listed	Non-breeding	0	One herring gull was recorded flying just outside the site boundary to the north.
Hooded Crow	Green Listed	Non-breeding	0	Hooded crows were recorded flying through the site.
House Martin	Amber Listed	Non-breeding	0	One house martin was recorded flying toward the north-west of the site over an improved agricultural grassland.
House Sparrow	Amber Listed	Confirmed	1	House sparrows were recorded toward the centre of the site at a field boundary on an area of spoil and bare ground.
Linnet	Amber Listed	Confirmed	6	Linnet were recorded throughout the site, predominantly along the field boundaries of improved agricultural grassland.
		Possible	2	
Little Egret	Green Listed Annex I	Non-breeding	0	Little egret were recorded flying over and along the east coast of the site.
Meadow Pipit	Red Listed	Confirmed	7	Meadow pipit were recorded throughout the site, predominantly in open grassland habitat in the south and north of the site. Singing birds were recorded.
		Possible	9	
Mistle Thrush	Amber Listed	Probable	1	Mistle thrush were recorded at the improved agricultural grassland field boundaries on areas of spoil and bare ground and on areas of scrub/wet grassland/ improved agricultural grassland.

Oystercatcher	Amber Listed	Non-breeding	0	Oystercatcher were recorded outside the site boundary along the southern coast.
Pheasant	Green Listed	Possible	1	One pheasant was recorded in an improved agricultural grassland field.
Sand Martin	Amber Listed	Non-breeding	0	Sand martin were recorded flying towards the north and south of the site over improved agricultural grassland fields and along the southern coastline, with peak counts of 6 individuals. It is likely that there are suitable nesting banks on the coastal periphery of the site in the south and additional suitable locations to the north of the site.
Sandwich Tern	Amber Listed Annex I	Non-breeding	0	Sandwich terns are known to breed at Lady's Island Lake, to the north-west of Carnsore, and regularly commute across the site between breeding and feeding sites.
Shag	Amber Listed	Non-breeding	0	Shag were recorded flying along the south coastline and towards the north of the site along the eastern coastline.
Shelduck	Amber Listed	Non-breeding	0	Two shelduck were recorded flying over an improved agricultural grassland field towards the centre of the site.
Skylark	Amber Listed	Confirmed	6	Skylark were recorded flying and calling over fields of improved agricultural grassland/dry calcareous and neutral grassland and areas of scrub with peak counts of two individuals. Singing males were also recorded.
		Possible	6	
Song Thrush	Green Listed	Possible	3	Song thrush were recorded predominantly in fields of improved agricultural grassland, with a peak count of two individuals.
Sparrowhawk	Amber Listed	Non-breeding	0	A sparrowhawk was recorded flying over a filed of improved agricultural grassland.

Starling	Amber Listed	Possible	4	Starling were recorded feeding in or flying over fields of improved agricultural grassland with a peak count of 80 individuals. It is possible that small numbers nest in the building ruins in the south of the site.
Stonechat	Amber Listed	Confirmed	8	Stonechat were recorded throughout the site along the field boundaries of improved agricultural grassland and in scrub habitat, with a peak count of ten individuals.
		Possible	3	
Swallow	Amber Listed	Probable	2	Swallows were recorded throughout the site flying over fields of improved agricultural grassland, with a peak count of two individuals. It is likely that swallows breed within buildings located in the north and south of the site.
Swift	Amber Listed	Non-breeding	0	A swift was recorded flying over a field of improved agricultural grassland in the south-western area of the site.
Turnstone	Green Listed	Non-breeding	0	Turnstones were recorded along the eastern coastline towards the north of the site. Six individuals were recorded just outside the site boundary.
Wheatear	Amber Listed	Possible	1	One wheatear was recorded in the very south of the site on an area of recolonising bare ground.
Whitethroat	Amber Listed	Confirmed	1	Whitethroats were in recorded dry meadows and grassy verges/scrub and improved agricultural grassland/dry calcareous and neutral grassland with a peak count of two individuals.
Willow Warbler	Green Listed	Possible	2	Willow warblers were recorded towards the south of the site in fields of improved agricultural grassland with one individual recorded at a time.

4 SUMMARY

4.1 A number of amber and red-listed species were recorded frequenting the proposed repowering development site during Vantage Point surveys undertaken between April and September 2020. These birds currently avoid, navigate or continue to use the air space not occupied by the existing turbines and turning blades to forage, hunt and commute. For birds in flight collision with moving turbine blades is a mortality risk. Some species due to their flight behaviour are more at risk to collision than others.

4.2 Notably sandwich tern and common tern were recorded regularly commuting through the operating wind farm travelling between off-shore feeding sites and breeding colonies at Lady's Island lake. While other tern species, arctic tern and roseate tern, appeared to avoid flying through the operating wind farm area. Avoidance of flights through the operating wind farm area was also noted by cormorant, and by grey heron, little egret, curlew, barnacle goose and grey plover, although to a lesser degree due to the overall low number of recorded flights of these species.

4.3 Kestrel continued to hunt within lands occupied by the operational wind farm and did not show signs of avoidance. One osprey flight was recorded through the operational wind farm on migration route south.

4.4 Birds breeding within the operating wind farm were generally attributable green, amber and red-listed passerines that nest in hedgerow, scrub and grassland habitats within the site. Breeding birds identified within the operating wind farm are typically not species that are very sensitive to wind farm developments but would be impacted by habitat loss and disturbance impacts.

4.5 A change in turbine dimensions proposed by the repowering development could present a collision risk window that is greater than the current collision risk window based on the existing turbine dimensions. An increase in turbine height and blade diameter could result in mortality through collision of those species that continue to use the lands and air space within the operating wind farm, which include sandwich tern, common tern, kestrel and osprey. Species that show avoidance and that generally fly around the operating wind farm would be less at risk to collision risk impacts from a change in turbine dimensions.

4.6 Never the less, all birds recorded during surveys undertaken between April and September 2020 would be subject to disturbance and displacement impacts during the decommissioning and construction of any repowering development, and habitat loss and fragmentation impacts at a minimum.

4.7 At this stage and without seeing any proposed design for the repowering development, it is difficult to provide detail on potential impacts and potential mitigation measures. As part of the Ecological Impact Assessment, where any likely significant effects are expected as a result of the proposed repowering development, recommendations to avoid, reduce or remedy likely significant effects (where necessary and appropriate) will be identified and provided to the design team. If appropriate, recommendations will also be made for the amelioration and enhancement of the site's biodiversity through the appropriate design of the proposed repowering development.

5 REFERENCES

Colhoun & Cummins, (2013). Birds of Conservation Concern in Ireland 2014 – 2019. BirdWatch Ireland.

Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH 2017).

Scottish Natural Heritage (SNH) guidance: Assessing the impact of repowered wind farms in nature *Consultation draft* (SNH 2018).

FIGURES

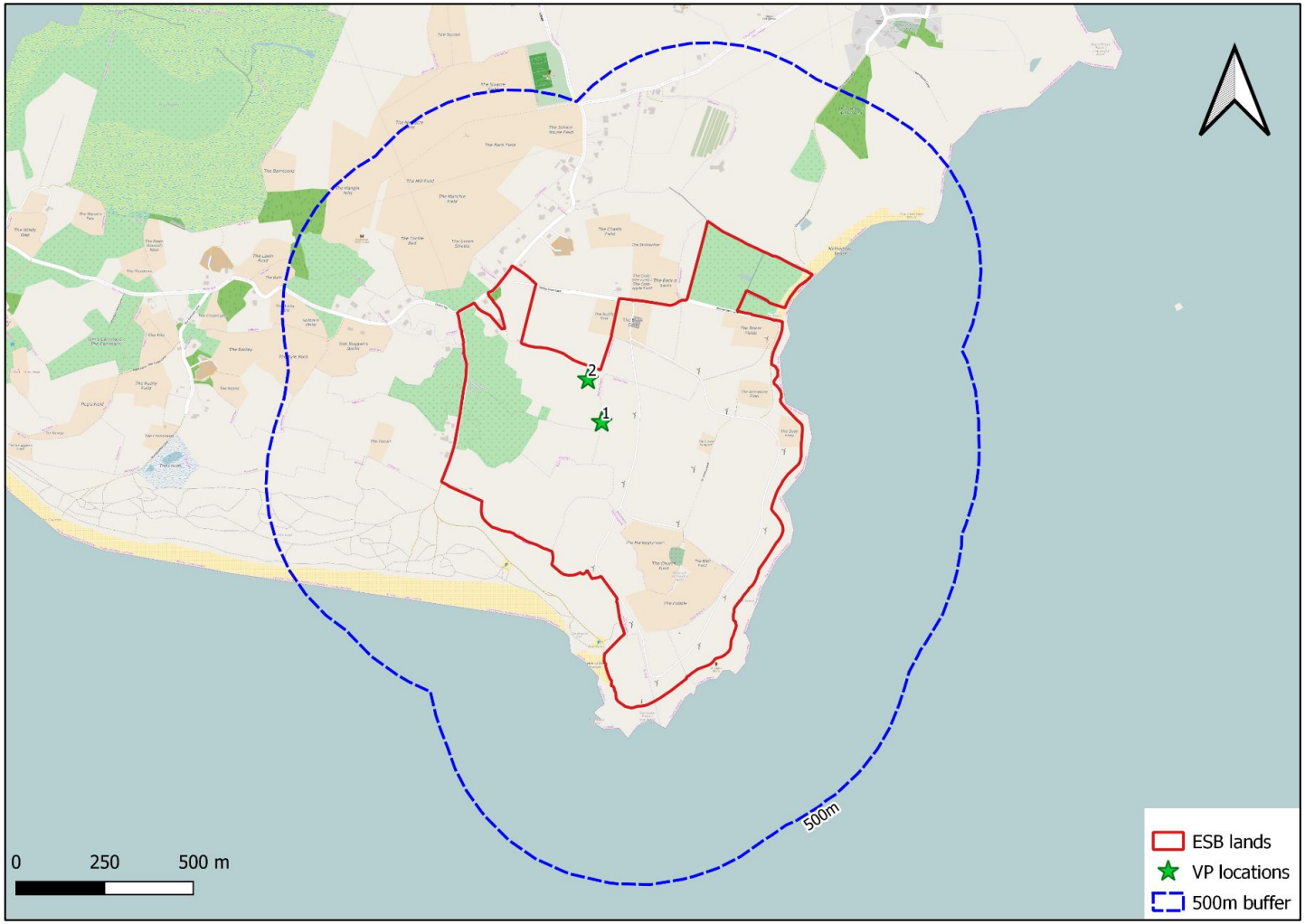

Figure 1: Ornithological Survey Area

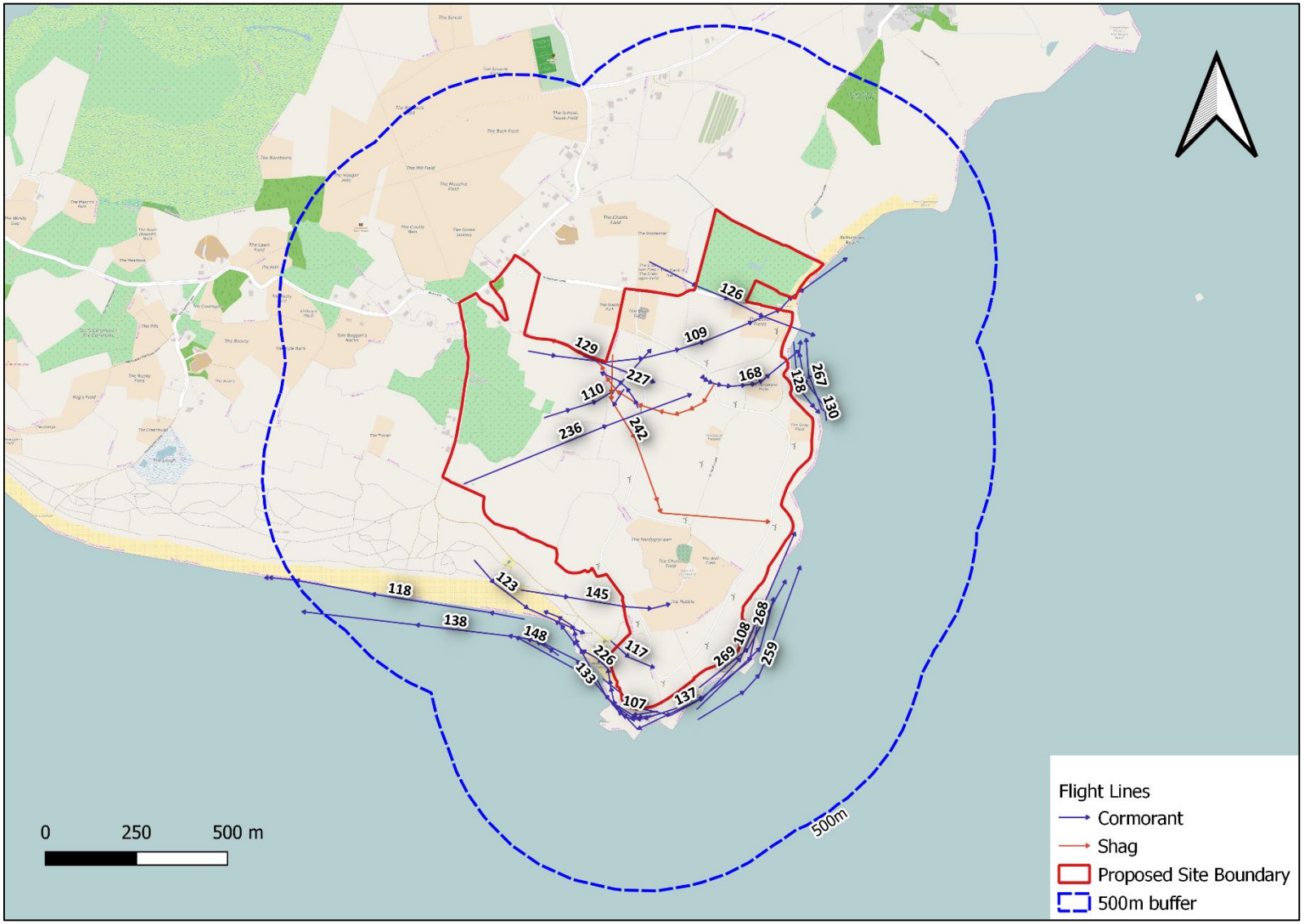

Figure 2: Cormorant and Shag Flight Lines

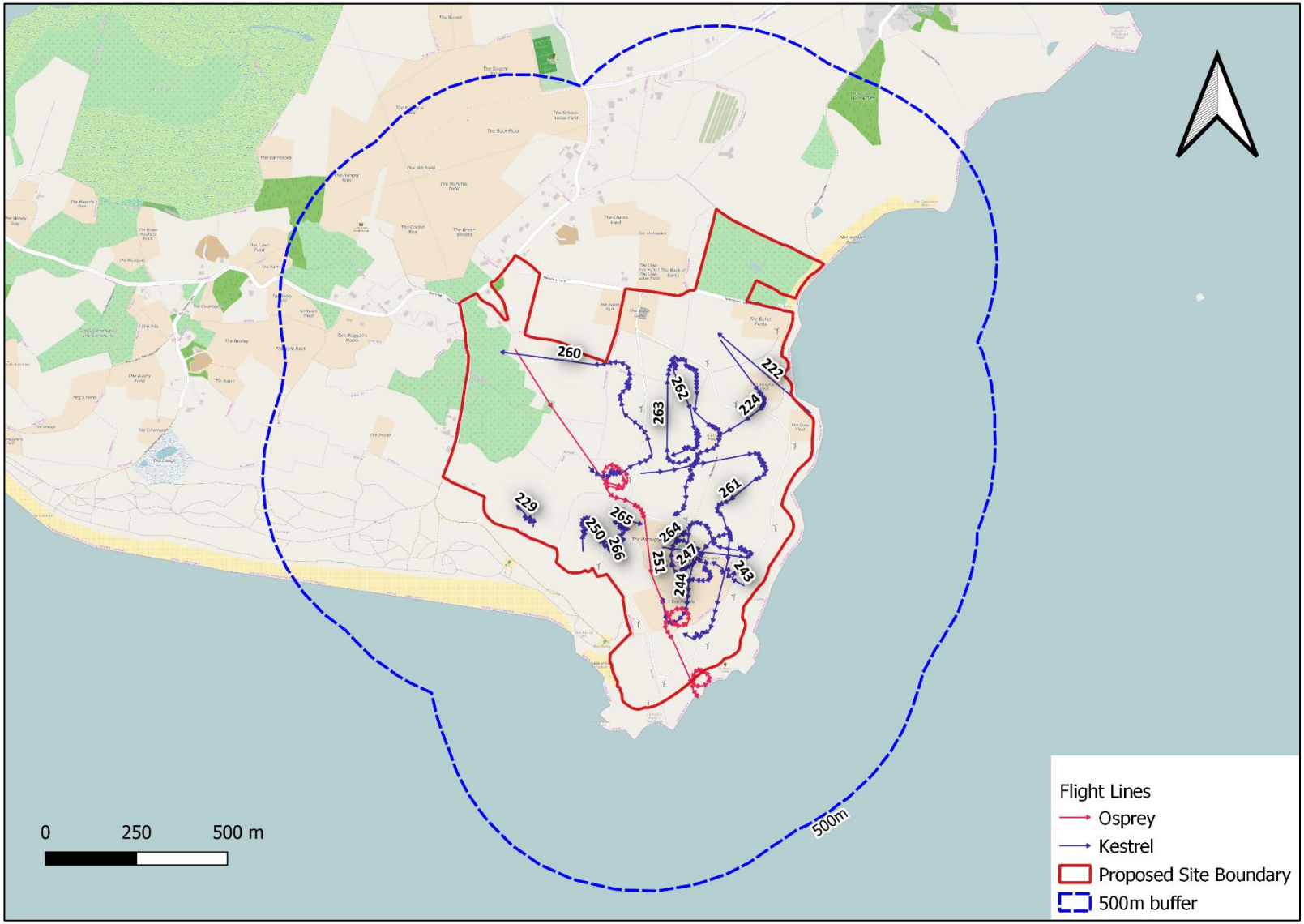

Figure 3: Kestrel and Osprey Flight Lines

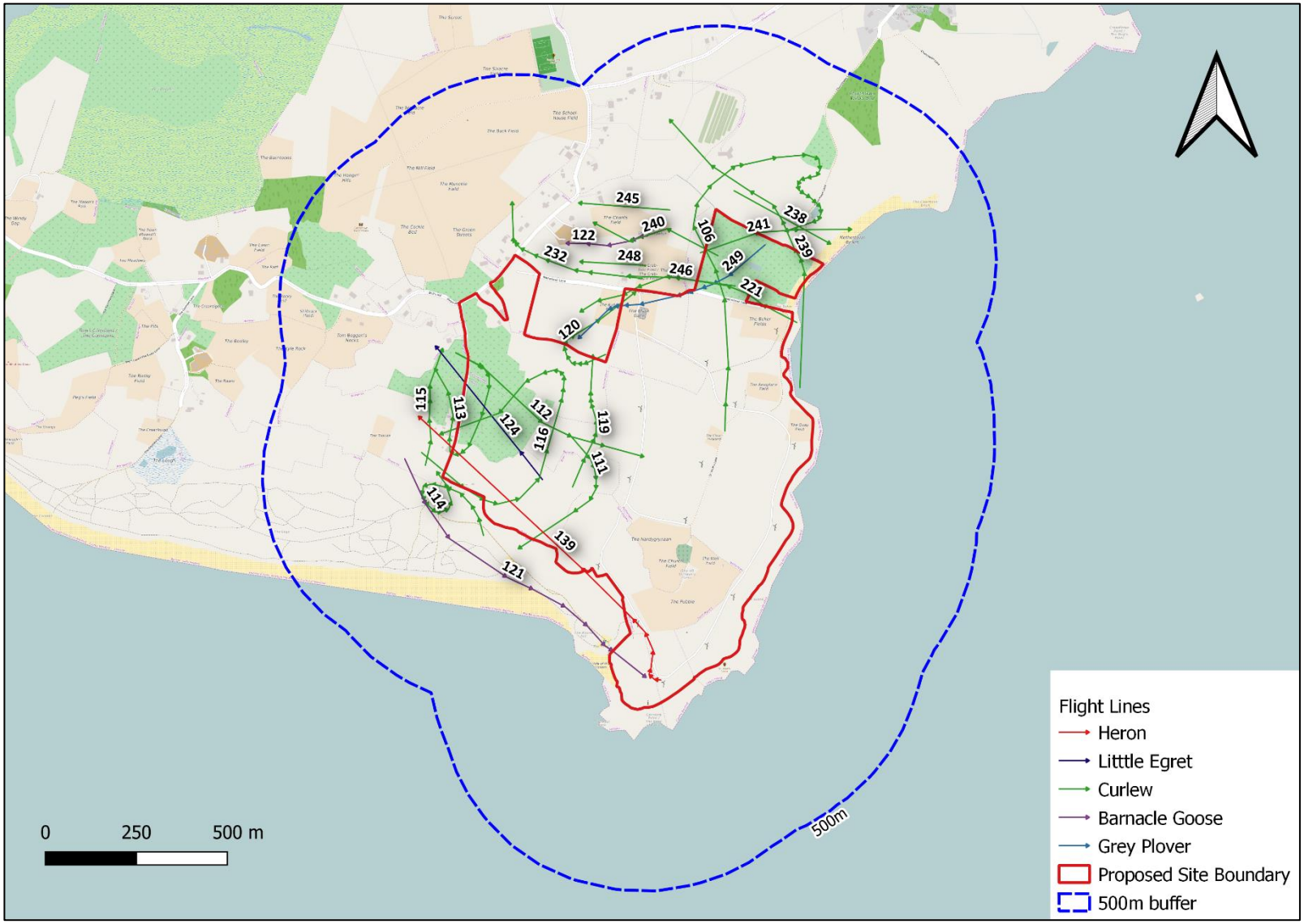

Figure 4: Heron, Little Egret, Curlew, Barnacle Goose and Grey Plover Flight Lines

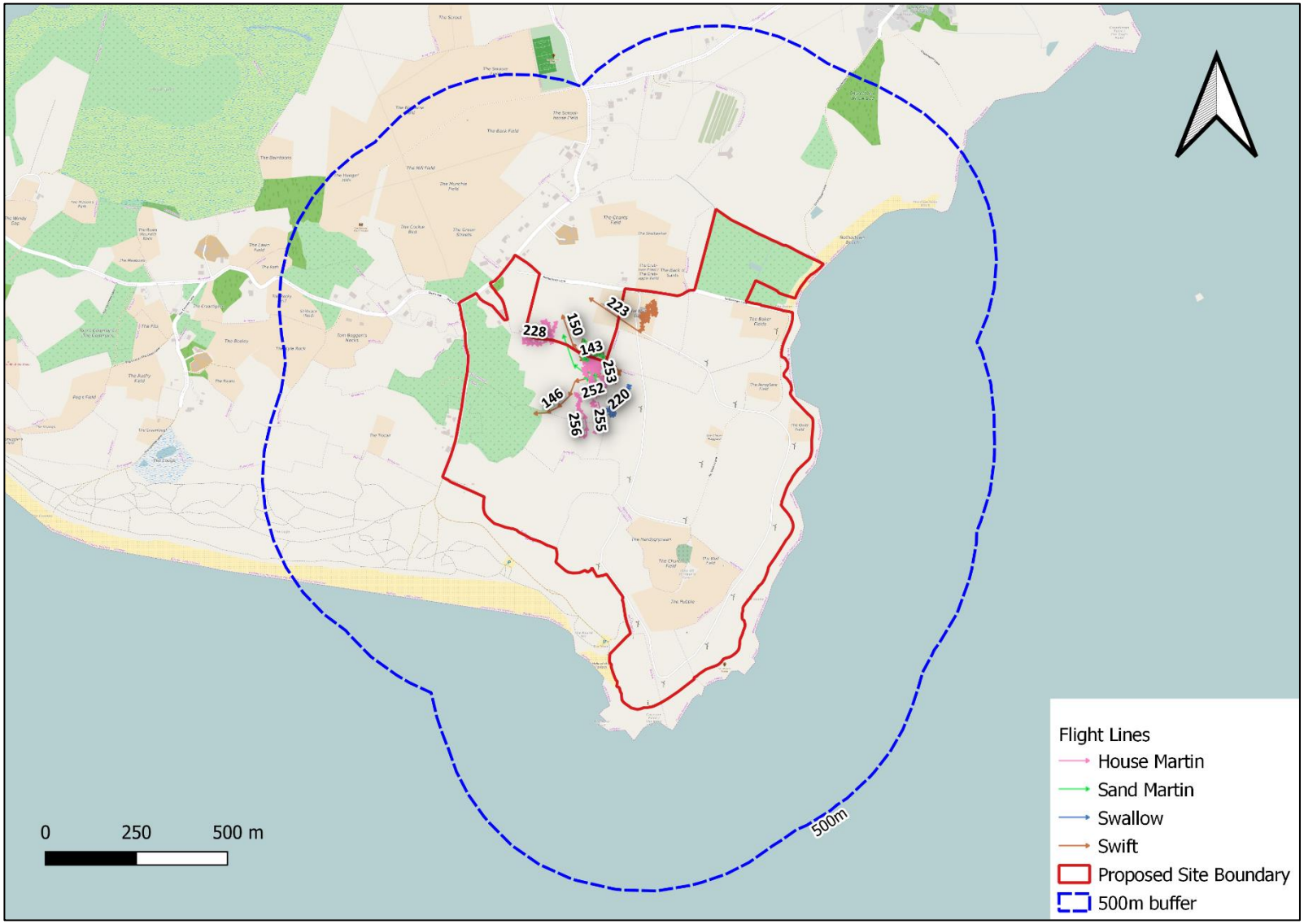

Figure 5: Swift, Sand Martin, House Martin and Swallow Flight Lines

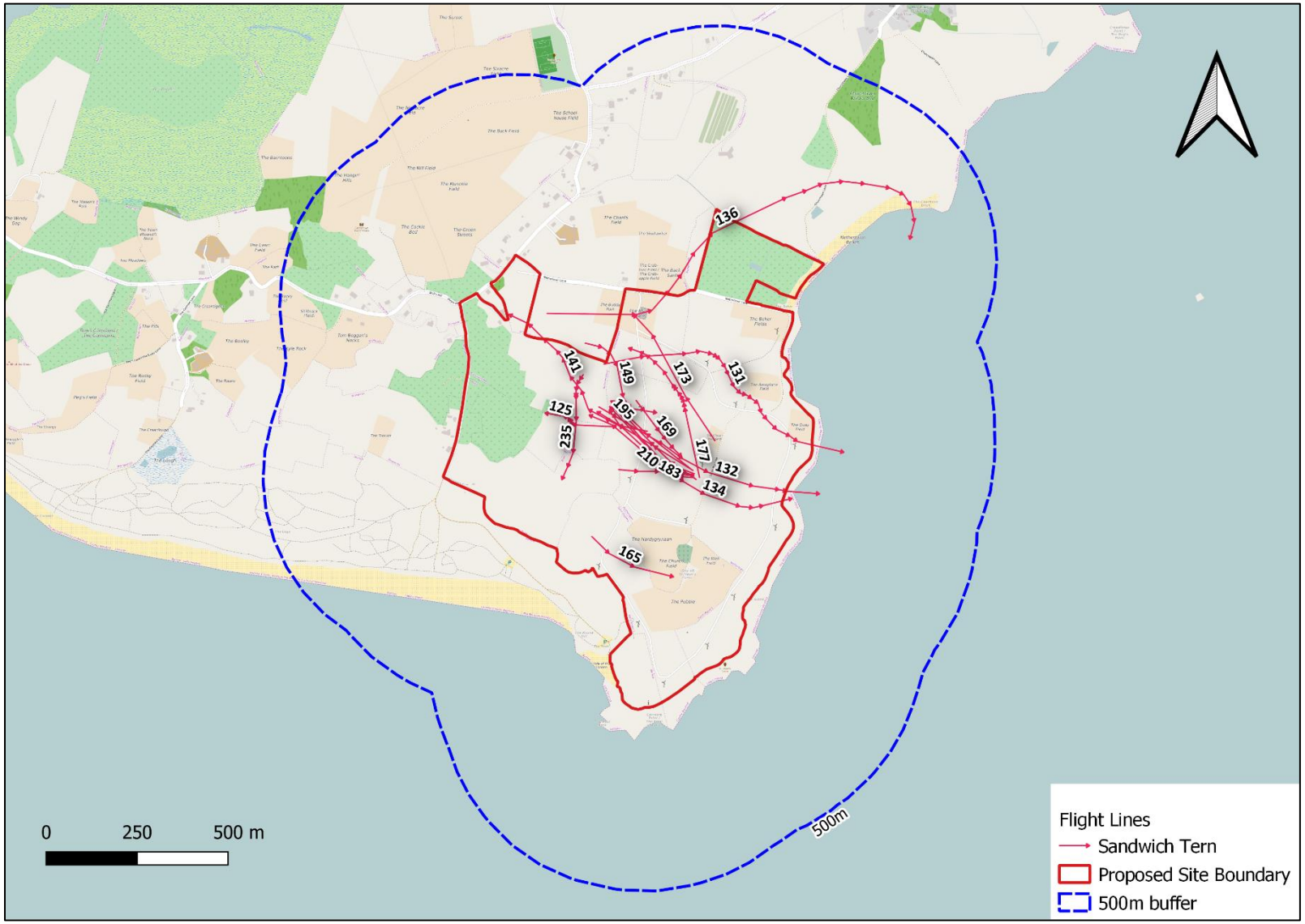

Figure 6: Sandwich Tern Flight Lines

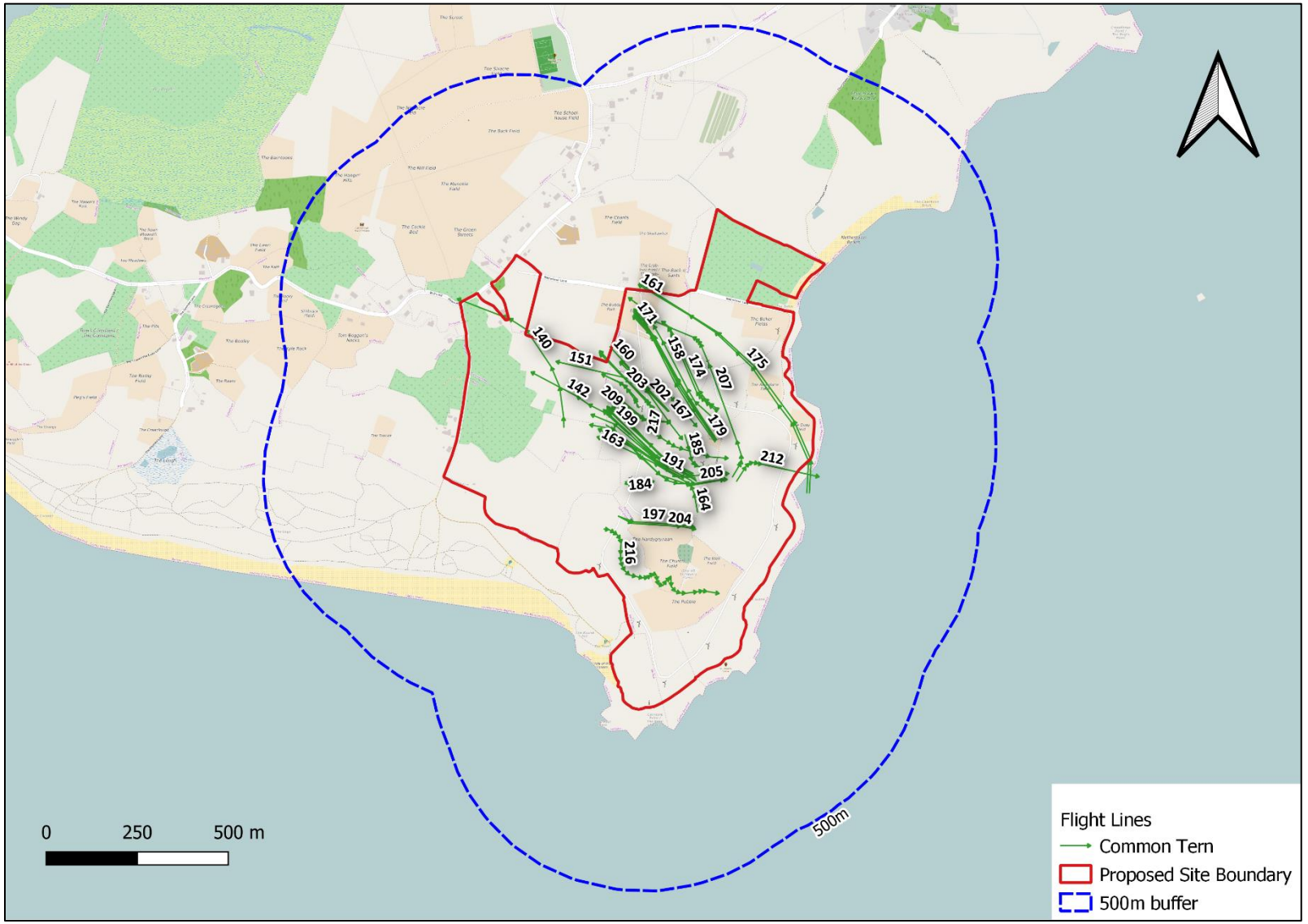

Figure 7: Common Tern Flight Lines

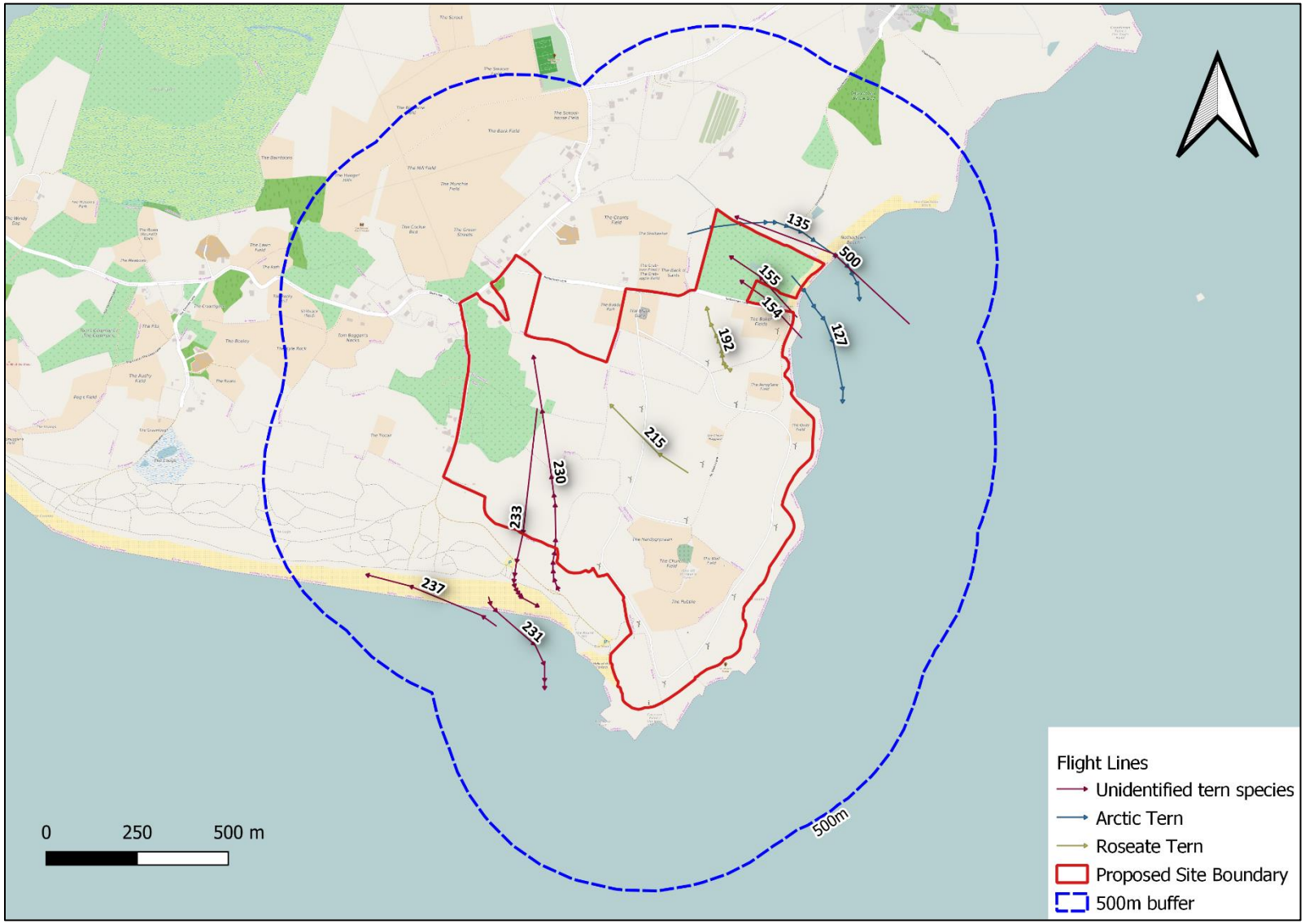

Figure 8: Arctic Tern, Roseate Tern and Unidentified Tern Species Flight Lines

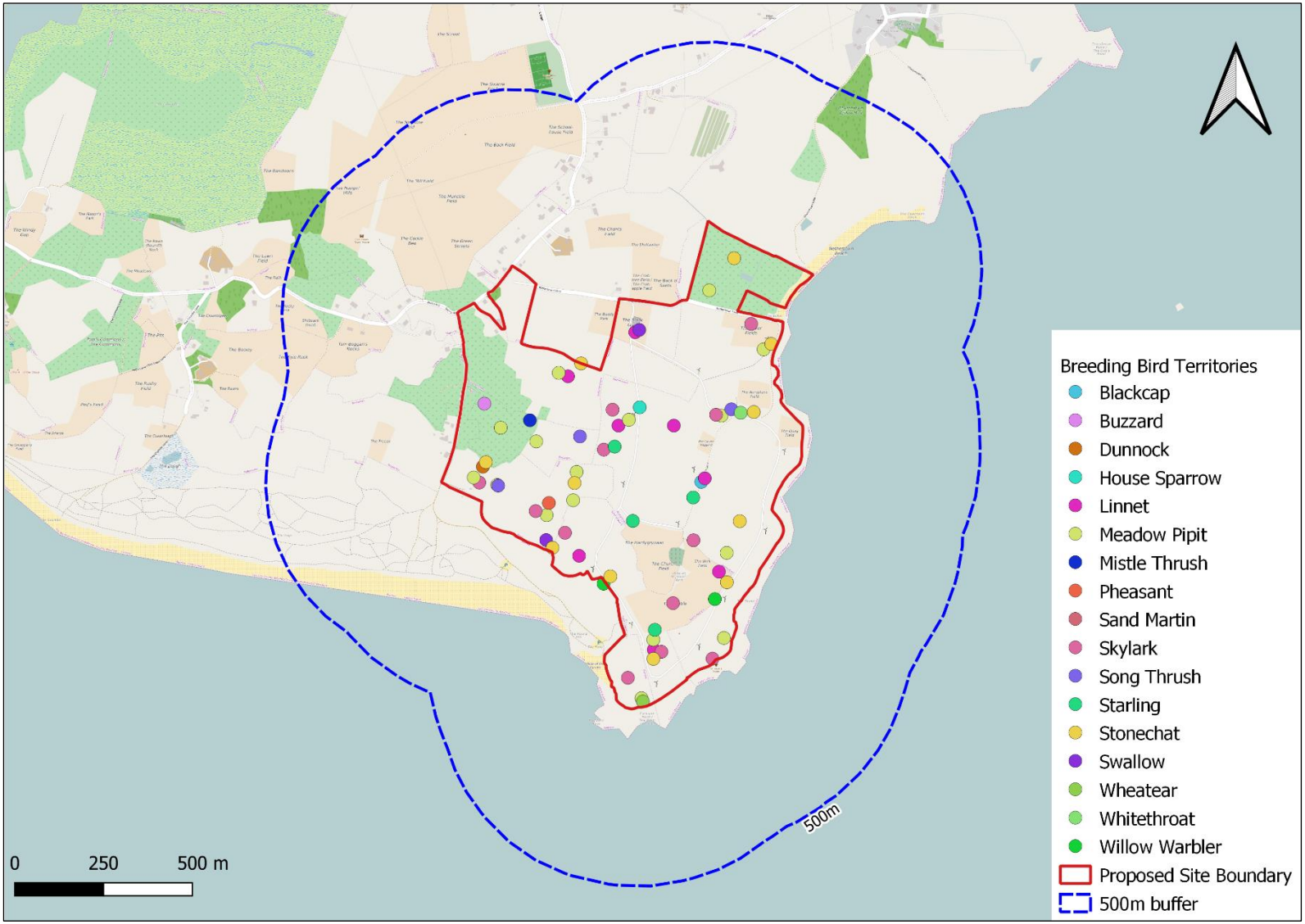

Figure 9: Breeding Bird Territories Identified within the Site.

APPENDIX 1 SUMMER VP WEATHER DATA

Table 6: Summer Weather Data for Vantage Point Surveys from April to September 2020

Date	VP	Observer	Start Time	Finish Time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
29/04/2020	1	CK	13:58	16:58	1	3	SW	0	3	1	2	0	0
29/04/2020	1	CK	13:58	16:58	2	3	SW	0	6	1	2	0	0
29/04/2020	1	CK	13:58	16:58	3	4	SW	2	7	1	2	0	0
30/04/2020	2	CK	07:25	10:25	1	5	SW	0	7	1	2	0	0
30/04/2020	2	CK	07:25	10:25	2	5	SW	1	7	1	2	0	0
30/04/2020	2	CK	07:25	10:25	3	5	SW	1	7	1	2	0	0
28/05/2020	2	CK	18:49	21:49	1	2	E	0	2	1	2	0	0
28/05/2020	2	CK	18:49	21:49	2	3	E	0	2	1	2	0	0
28/05/2020	2	CK	18:49	21:49	3	3	E	0	2	1	2	0	0
29/05/2020	1	CK	10:03	13:03	1	3	SW	0	1	1	2	0	0
29/05/2020	1	CK	10:03	13:03	2	4	SW	0	1	1	2	0	0
29/05/2020	1	CK	10:03	13:03	3	3	E	0	3	1	2	0	0
05/06/2020	2	CK	11:00	14:00	1	4	NW	0	5	1	2	0	0
05/06/2020	2	CK	11:00	14:00	2	4	NW	0	4	1	2	0	0
05/06/2020	2	CK	11:00	14:00	3	4	NW	2	4	1	2	0	0
17/06/2020	1	CK	11:04	14:04	1	3	SW	0	7	1	2	0	0
17/06/2020	1	CK	11:04	14:04	2	3	SW	0	7	1	2	0	0
17/06/2020	1	CK	11:04	14:04	3	3	SW	0	5	1	2	0	0
22/07/2020	1	CK	18:00	21:00	1	4	SW	0	4	1	2	0	0
22/07/2020	1	CK	18:00	21:00	2	4	SW	0	4	1	2	0	0
22/07/2020	1	CK	18:00	21:00	3	4	SW	0	5	1	2	0	0
22/07/2020	2	CK	14:03	17:03	1	4	SW	0	4	1	2	0	0
22/07/2020	2	CK	14:03	17:03	2	6	SW	0	3	1	2	0	0

22/07/2020	2	CK	14:03	17:03	3	6	SW	0	4	1	2	0	0
28/08/2020	1	MMW	07:20	10:20	1	2	NE	0	8	1	2	0	0
28/08/2020	1	MMW	07:20	10:20	2	3	NE	0	7	1	2	0	0
28/08/2020	1	MMW	07:20	10:20	3	4	NE	0	7	1	2	0	0
28/08/2020	2	MMW	10:20	13:20	1	4	N	0	7	1	2	0	0
28/08/2020	2	MMW	10:20	13:20	2	5	NW	0	8	1	2	0	0
28/08/2020	2	MMW	10:20	13:20	3	7	NW	3	8	1	0-1	0	0
15/09/2020	2	CK	07:38	10:38	1	1	SW	1	8	0	0	0	0
15/09/2020	2	CK	07:38	10:38	2	1	SW	1	8	0	1	0	0
15/09/2020	2	CK	07:38	10:38	3	1	SW	0	8	0	1	0	0
29/09/2020	1	CK	11:25	14:25	1	2	SW	0	2	2	2	0	0
29/09/2020	1	CK	11:25	14:25	2	3	SW	0	2	2	2	0	0
29/09/2020	1	CK	11:25	14:25	3	3	SW	0	2	2	2	0	0

Table 7: Weather condition variables

Wind speed				**Rain**		**Cloud Height**		**Cloud Cover**	In eighths **1/8, 2/8 etc.**	
0	Calm	**7**	Mod. gale	None	**0**	<150m	**0**			
1	Light air	**8**	Fresh gale	Drizzle/Mist	**1**	150-500m	**1**	**Frost**	None	**0**
2	Light breeze	**9**	Strong gale	Light showers	**2**	>500m	**2**		Onsite	**1**
3	Gentle breeze	**10**	Whole gale	Heavy showers	**3**				High Ground	**2**
4	Mod. breeze	**11**	Storm	Light Rain	**4**	**Visibility**				
5	Fresh breeze	**12**	Hurricane	Heavy rain	**5**	Poor (<1km)	**0**	**Snow**	None	**0**
6	Strong breeze					Moderate (1-2km)	**1**		Onsite	**1**
Wind Direction		16 point compass: **N, NNE, NE, ENE, E etc.**				Good (>2km)	**2**		High ground	**2**

APPENDIX 2 BREEDING BIRDS SURVEY WEATHER DATA

Table 8: Breeding Birds Survey Weather Data from April to September 2020

Date	Observer	Start time	Finish time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
29/04/2020	CK	10:50	13:15	1	3	SW	0	3	2	2	0	0
29/04/2020	CK	10:50	13:15	2	3	SW	0	3	2	2	0	0
29/04/2020	CK	10:50	13:15	3	3	SW	0	3	2	2	0	0
29/05/2020	CK	07:25	10:00	1	3	SW	0	1	1	2	0	0
29/05/2020	CK	07:25	10:00	2	3	SW	0	3	1	2	0	0
29/05/2020	CK	07:25	10:00	3	3	SW	0	4	1	2	0	0
05/06/2020	CK	07:15	09:50	1	3	NW	0	8	1	2	0	0
05/06/2020	CK	07:15	09:50	2	3	NW	0	7	1	2	0	0
05/06/2020	CK	07:15	09:50	3	3	NW	0	6	1	2	0	0
17/06/2020	CK	07:27	10:00	1	1	SW	1	8	1	2	0	0
17/06/2020	CK	07:27	10:00	2	1	SW	0	8	1	2	0	0
17/06/2020	CK	07:27	10:00	3	1	SW	0	8	1	2	0	0

APPENDIX 3 TARGET SPECIES FLIGHT DETAILS

Table 9: Summer 2020 Vantage Point Survey Results for Target Species Flight Details

Flight No.	Date	VP	Flight Start Time	BTO Code*	Min No. of Birds	Flight Duration (secs)	Height Info at 15 second intervals															Behaviour			End of Flight	
							0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	Transit	Foraging/Hunting	Carrying food/ nesting material	Landed	Flew out of sight
106	29/04/20	1	14:35	CU	1	75	2	2	2	2	2	2										✓			✓	
107	29/04/20	1	15:25	CA	1	15	1	1														✓				✓
108	29/04/20	1	15:35	CA	1	45	1	1	1	1												✓				✓
109	29/04/20	1	16:27	CA	1	75	1	1	1	1	1	1										✓			✓	
110	30/04/20	2	07:36	CA	1	30	2	2	2													✓				✓
111	30/04/20	2	07:49	CU	30	60	1	1	1	1	1											✓			✓	
112	30/04/20	2	07:49	CU	4	45	1	1	1	1												✓				✓
113	30/04/20	2	07:49	CU	15	30	1	1	1													✓				✓
114	30/04/20	2	07:52	CU	30	30	1	1	1													✓				✓
115	30/04/20	2	08:17	CU	7	30	1	1	1													✓				✓
116	30/04/20	2	08:29	CU	30	60	1	1	1	1	1											✓				✓
117	30/04/20	2	08:32	CA	1	15	1	1														✓				✓
118	30/04/20	2	08:46	CA	1	30	1	1	1													✓				✓
119	30/04/20	2	08:48	CU	9	45	1	1	2	1												✓			✓	
120	30/04/20	2	08:50	CU	8	45	1	1	1	1												✓				✓
121	30/04/20	2	09:05	BY	9	75	2	2	2	2	2	2										✓				✓
122	30/04/20	2	09:08	BY	7	15	2	2														✓				✓
123	30/04/20	2	09:13	CA	1	30	1	1	1													✓				✓
124	30/04/20	2	10:07	ET	1	30	1	1	1													✓				✓
125	29/05/20	1	10:14	TE	2	30	2	2	2													✓				✓
126	29/05/20	1	10:26	CA	1	90	1	1	1	1	1	1	1									✓				✓
127	29/05/20	1	10:31	AE	1	30	2	2	2													✓				✓
128	29/05/20	1	10:32	CA	1	45	1	1	1	1												✓				✓
129	29/05/20	1	10:37	SH	1	45	2	2	1	1												✓				✓
130	29/05/20	1	10:47	CA	1	15	1	1														✓				✓
131	29/05/20	1	10:54	TE	1	45	2	2	2	2												✓				✓

132	29/05/20	1	10:57	TE	2	45	2	2	2	2												✓				✓
133	29/05/20	1	11:08	CA	1	30	1	1	1													✓				✓
134	29/05/20	1	11:21	TE	1	30	2	2	2													✓				✓
135	29/05/20	1	11:42	AF	1	30	1	1	1													✓				✓
136	29/05/20	1	11:52	TE	2	90	2	2	2	2	2	1	1									✓				✓
137	29/05/20	1	12:28	CA	1	45	1	1	1	1												✓				✓
138	28/05/20	2	19:01	CA	1	45	1	1	1	1												✓				✓
139	28/05/20	2	21:07	H.	1	60	2	2	2	2	2											✓				✓
140	05/06/20	2	11:27	CN	1	30	2	2	2															✓		✓
141	05/06/20	2	11:30	TE	2	30	2	2	2													✓				✓
142	05/06/20	2	11:37	CN	1	30	2	2	2													✓				✓
143	05/06/20	2	11:47	SI	1	90	3	3	3	3	2	2	2										✓			✓
144	05/06/20	2	11:47	SM	1	75	3	3	3	3	2	2											✓			✓
145	05/06/20	2	12:33	CA	1	15	1	1														✓				✓
146	05/06/20	2	12:48	SI	3	75	3	3	3	3	2	1											✓		✓	
147	05/06/20	2	12:52	SM	3	60	3	3	3	2	1												✓			✓
148	05/06/20	2	13:07	CA	1	45	2	2	2	2												✓				✓
149	05/06/20	2	13:15	TE	3	30	3	3	3													✓				✓
150	05/06/20	2	13:35	SI	10	120	3	3	3	3	3	3	3	3	3								✓			✓
151	05/06/20	2	13:58	CN	1	30	3	3	3													✓				✓
152	17/06/20	1	11:07	CN	4	30	2	2	2															✓		✓
153	17/06/20	1	11:07	CA	1	30	1	1	1													✓				✓
154	17/06/20	1	11:09	Tern species	3	30	2	2	2													✓				✓
155	17/06/20	1	11:11	Tern species	4	30	2	2	2													✓				✓
156	17/06/20	1	11:15	CN	1	45	2	2	2	2														✓		✓
157	17/06/20	1	11:20	CN	1	30	2	2	2															✓		✓
158	17/06/20	1	11:21	CN	1	30	2	2	2															✓		✓
159	17/06/20	1	11:23	CN	1	15	2	2																✓		✓
160	17/06/20	1	11:24	CN	1	30	2	2	2													✓				✓
161	17/06/20	1	11:26	CN	1	45	2	2	2	2														✓		✓
162	17/06/20	1	11:28	CN	1	45	2	2	2	2														✓		✓
163	17/06/20	1	11:29	CN	1	45	2	2	2	2														✓		✓
164	17/06/20	1	11:32	CN	1	30	2	2	2															✓		✓
165	17/06/20	1	11:36	TE	1	30	2	2	2													✓				✓
166	17/06/20	1	11:38	CN	1	30	2	2	2													✓				✓
167	17/06/20	1	11:39	CN	1	30	2	2	2													✓				✓
168	17/06/20	1	11:40	CA	1	45	1	1	1	1												✓				✓
169	17/06/20	1	11:48	TE	1	30	2	2	2													✓				✓
170	17/06/20	1	11:51	TE	1	30	2	2	2															✓		✓
171	17/06/20	1	11:54	CN	1	30	2	2	2													✓				✓
172	17/06/20	1	11:55	CN	2	30	2	2	2													✓				✓
173	17/06/20	1	11:56	TE	1	15	2	2																✓		✓
174	17/06/20	1	11:57	CN	1	15	2	2																✓		✓
175	17/06/20	1	11:59	CN	1	30	2	2	2															✓		✓
176	17/06/20	1	12:00	CN	1	30	2	2	2															✓		✓
177	17/06/20	1	12:00	TE	1	30	2	2	2															✓		✓
178	17/06/20	1	12:02	CN	1	30	2	2	2															✓		✓
179	17/06/20	1	12:04	CN	1	15	2	2																✓		✓
180	17/06/20	1	12:12	TE	1	30	2	2	2													✓				✓
181	17/06/20	1	12:16	CN	2	30	2	2	2													✓				✓

182	17/06/20	1	12:19	CA	1	30	1	1	1													✓				✓
183	17/06/20	1	12:21	TE	1	15	2	2																✓		✓
184	17/06/20	1	12:21	CN	1	15	2	2														✓				✓
185	17/06/20	1	12:21	CN	1	15	2	2														✓				✓
186	17/06/20	1	12:22	TE	1	15	2	2																✓		✓
187	17/06/20	1	12:24	CN	1	15	2	2														✓				✓
188	17/06/20	1	12:26	CN	1	15	2	2																✓		✓
189	17/06/20	1	12:26	CN	2	15	2	2																✓		✓
190	17/06/20	1	12:27	CN	1	15	2	2																✓		✓
191	17/06/20	1	12:29	CN	1	15	2	2																✓		✓
192	17/06/20	1	12:33	RS	1	15	1	1														✓				✓
193	17/06/20	1	12:36	CN	1	15	2	2														✓				✓
194	17/06/20	1	12:36	CN	2	30	2	2	2													✓				✓
195	17/06/20	1	12:39	TE	1	15	3	3																✓		✓
196	17/06/20	1	12:39	TE	1	15	2	2																✓		✓
197	17/06/20	1	12:40	CN	1	30	2	2	2													✓				✓
198	17/06/20	1	12:42	CN	1	30	2	2	2													✓				✓
199	17/06/20	1	12:43	CN	1	30	2	2	2													✓				✓
200	17/06/20	1	12:49	CN	1	15	1	1														✓				✓
201	17/06/20	1	12:52	CN	1	30	2	2	2															✓		✓
202	17/06/20	1	12:52	CN	1	30	2	2	2															✓		✓
203	17/06/20	1	12:53	CN	1	30	2	2	2															✓		✓
204	17/06/20	1	12:59	CN	1	30	1	1	1													✓				✓
205	17/06/20	1	13:05	CN	1	30	2	2	2													✓				✓
206	17/06/20	1	13:22	CN	1	30	2	2	2													✓				✓
207	17/06/20	1	13:25	CN	1	30	1	1	1													✓				✓
208	17/06/20	1	13:26	CN	1	15	2	2														✓				✓
209	17/06/20	1	13:26	CN	1	30	2	2	2													✓				✓
210	17/06/20	1	13:27	TE	1	15	2	2														✓				✓
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215	17/06/20	1	13:50	RS	1	30	1	1	1													✓				✓
216	17/06/20	1	13:52	CN	1	45	1	1	1	1												✓				✓
217	17/06/20	1	13:58	CN	1	30	2	2	2													✓				✓
218	17/06/20	1	14:01	CN	1	30	2	2	2													✓				✓
219	22/07/20	1	18:50	SL	1	15	1																✓			✓
220	22/07/20	1	18:52	SL	1	30	1	1															✓			✓
221	22/07/20	1	19:10	CU	1	45	1	1	1	1												✓				✓
222	22/07/20	1	19:18	K.	1	30	1	1	1														✓			✓
223	22/07/20	1	19:26	SI	1	30	1	1	1														✓			✓
224	22/07/20	1	20:45	K.	1	75	1	1	1	1	1	1										✓				✓
225	22/07/20	2	14:25	HM	1	30	1	1	1														✓		✓	
226	22/07/20	2	14:38	CA	1	15	1	1														✓				✓
227	22/07/20	2	14:47	CA	1	30	2	2	2													✓				✓
228	22/07/20	2	15:39	HM	3	90	1	1	1	1	1	1	1										✓		✓	
229	22/07/20	2	15:55	K.	1	15	1	1															✓		✓	
230	22/07/20	2	15:58	Tern species	1	75	3	3	3	3	3	3										✓				✓
231	22/07/20	2	16:11	Tern species	1	15	2	2														✓				✓

232	22/07/20	2	16:17	CU	1	60	2	2	2	2	2											✓				✓
233	22/07/20	2	16:22	Tern species	1	45	1	1	1	1												✓				✓
234	22/07/20	2	16:39	SL	1	15	1																✓			✓
235	22/07/20	2	16:45	TE	1	30	1	1														✓				✓
236	22/07/20	2	16:47	CA	1	45	3	3	3													✓				✓
237	22/07/20	2	16:54	Tern species	1	45	2	2	2													✓				✓
238	28/08/20	1	07:26	CU	1	12	1															✓			✓	
239	28/08/20	1	07:55	CU	1	101	1	2	2	2	2	1	1									✓				✓
240	28/08/20	1	07:59	CU	14	40	1	1	1													✓				✓
241	28/08/20	1	08:01	CU	20	27	1	1														✓			✓	
242	28/08/20	1	08:09	SH	1	30	1	1	1														✓			✓
243	28/08/20	1	08:11	K.	1	28	1	1															✓		✓	
244	28/08/20	1	08:23	K.	1	131	1	1	1	1	1	1	2	1	1								✓		✓	
245	28/08/20	1	09:24	CU	10	25	1	1														✓				✓
246	28/08/20	1	09:30	CU	3	39	1	1	1													✓			t	✓
247	28/08/20	1	09:50	K.	1	85	1	1	1	1	1	1											✓		✓	
248	28/08/20	1	09:53	CU	1	5	1															✓				✓
249	28/08/20	1	09:54	GV	3	17	2	2														✓				✓
250	28/08/20	2	11:01	K.	1	52	1	1	1	1													✓			✓
251	28/08/20	2	12:23	OS	1	63	4	2	2	2	2											✓				✓
252	15/09/20	2	09:02	HM	1	30	1	1	1														✓			✓
253	15/09/20	2	09:44	HM	2	15	1	1														✓				✓
254	15/09/20	2	09:49	HM	1	30	1	1	1													✓				✓
255	15/09/20	2	09:52	HM	1	15	2															✓				✓
256	15/09/20	2	10:11	HM	7	15	2	2															✓			✓
257	15/09/20	2	10:18	HM	5	15	1	1															✓			✓
258	15/09/20	2	10:36	HM	2	15	2	2															✓			✓
259	29/09/20	1	11:29	CA	1	30	1	1	1													✓				✓
260	29/09/20	1	12:52	K.	1	180	2	2	2	2	2	2	2	2	2	2	2	2	2				✓			✓
261	29/09/20	1	13:01	K.	1	135	2	2	2	2	2	2	2	2	2	2							✓		✓	
262	29/09/20	1	13:18	K.	1	60	1	1	1	1	1												✓		✓	
263	29/09/20	1	13:19	K.	1	120	1	1	1	1	2	1	1	2	1								✓		✓	
264	29/09/20	1	13:23	K.	1	15	1	1															✓		✓	
265	29/09/20	1	13:29	K.	1	15	1	1															✓			✓
266	29/09/20	1	13:30	K.	1	15	1	1															✓			✓
267	28/08/20	1	07:50	CA	1	15	1	1														✓			✓	
268	28/08/20	1	08:15	CA	1	30	1	1	1													✓				✓
269	28/08/20	2	10:50	CA	1	30	1	1	1													✓				✓

*BTO Code	Species
AE	Arctic Tern
BY	Barnacle Goose
CA	Cormorant
CN	Common Tern
CU	Curlew
H	Grey Heron
GV	Grey Plover
HM	House Martin
K	Kestrel
OS	Osprey
RS	Roseate Tern
SM	Sand Martin
TE	Sandwich Tern
SH	Shag
SL	Swallow
SI	Swift

ESB

Winter Bird Report 2019-2020

Carnsore Windfarm

602677 -R1 (00)

JULY 2020

RSK GENERAL NOTES

Project No.: 602677 (01)

Title: Carnsore Windfarm Winter Bird Monitoring Report 2019-2020

Client: ESB

Date: 28th July 2020

Office: Dublin

Status: Draft

Author	Lorna Gill	**Technical reviewer for Scott Cawley**	Maeve Maher-McWilliams
Date:	06/07/2020	Date:	23/07/2020
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Date:	28/07/2020	Date:	24/07/2020

Technical and Quality review for RSK carried out by Mark Lang MCIEEM, CEnv, CEcol, Associate Director.

Date: 03/8/2020

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

Project background

1.1 Scott Cawley were commissioned by RSK on behalf of ESB Ireland to undertake winter bird surveys at the operational Carnsore Windfarm located at Carnsore Point, County Wexford. Winter bird surveys completed between November 2019 and March 2020 have been undertaken to inform the proposed repowering development of the currently operational Carnsore Windfarm.

1.2 This report presents the survey methodology and the survey results of winter bird surveys undertaken between November 2019 and March 2020.

Existing environment

1.3 Carnsore Wind Farm (hereafter referred to as 'the site') is located at Carnsore Point, County Wexford. The site contains fourteen turbines located on improved agricultural grassland with a sand dune system to the south. To the east of the site is the Irish Sea and to the south is the Atlantic Ocean.

1.4 Habitats within the site include mostly agricultural fields grazed by livestock, hedgerows forming field boundaries and areas of scattered bramble and gorse scrub are found throughout the site, with a larger area dominated by scrub in the west of the site.

Statement of authority

1.5 Vantage point surveys were carried out by Caroline Kelly and Maeve Maher-McWilliams of Scott Cawley. The report was authored by Lorna Gill of Scott Cawley. The report has been reviewed for quality assurance purposes by Maeve Maher-McWilliams ACIEEM Principal Ecologist and Ashling Cronin MIEnvSc Technical Director with Scott Cawley Ltd.

1.6 Caroline Kelly holds an honours degree in Environmental Biology, from University College Dublin (UCD) and a Masters in Applied Ecological Assessment from University College Cork (UCC). She is a Senior Ecologist at Scott Cawley, having worked at the company since 2015. With respect to bird surveys, Caroline has experience in a range of different survey types including breeding bird surveys (including raptors), vantage point (VP) surveys (including hen harrier breeding/ roosting surveys), wintering bird surveys and targeted species surveys (e.g. surveys for Light-bellied Brent Goose).

1.7 Lorna Gill is a Consultant Ecologist with Scott Cawley. Lorna holds an MSc in Conservation and Biodiversity from the University of Exeter and an honours degree in Natural Sciences with a specialisation in Zoology from Trinity College Dublin. Lorna is experienced in carrying out field surveys in Ireland including wintering birds and breeding birds

1.8 Maeve Maher-McWilliams is a Principal Ecologist with Scott Cawley and is an Associate member of CIEEM.

1.9 Ashling is a Technical Director with Scott Cawley

2 METHODOLOGY

2.1 The surveys reported herein were carried out between November 2019 and March 2020 and covered one winter bird season. Survey methodology follows Scottish Natural Heritage (SNH) guidance *Assessing the impact of repowered wind farms in nature* (*Consultation draft)* (SNH 2018), and *Recommended bird survey methods to inform impact assessment of onshore wind farms* (SNH 2017).

2.2 Bird surveys for repowering developments are approached differently to proposed wind farms on undeveloped sites. The baseline collected on a site with an existing operational wind farm may skew results of standard surveys intended for undeveloped sites. Displacement of birds from the site due to the presence of the operating wind farm will possibly distort bird activity within the site. As such surveys have been adapted accordingly and are presented below.

Desk Study

2.3 A desk study was undertaken to collate available information on the local ornithological environment. The following resources were used to inform the assessment presented in this report:

- Ordnance Survey Ireland mapping and aerial photography from http://map.geohive.ie/
- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS)
- Records of ornithological data held by the National Biodiversity Data Centre (NBDC)
- Irish-Wetlands Bird Surveys data held by BirdWatch Ireland (BWI)
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (BoCCI) (Colhoun & Cummins, 2013)
- Tern Movements around Carnsore Point, Co. Wexford, May-July 1998. BirdWatch Ireland Conservation Report no. 98/3.
- Ornithological Monitoring at Carnsore Point, Co. Wexford, April-July 1999. BirdWatch Ireland, Conservation Report no.99/7.
- Carnsore Point Windfarm Environmental Impact Statement. (1999/2000) ESB International.
- Ornithological Monitoring at Carnsore Point Windfarm and Environs (2003). A report to Hibernian Wind Power, by Joseph Adamson.
- Ornithological Monitoring at Carnsore Point Windfarm and Environs (2004). A report to Hibernian Wind Power, by Dave Daly.
- Ornithological Monitoring at Carnsore Point Windfarm and Environs (2005). A report to Hibernian Wind Power, by Dave Daly.

Vantage point survey

2.4 Vantage point (VP) surveys were undertaken using an adapted standard methodology as described in SNH (2017) to provide data for the assessment of flight activity of target

species within the site. The VP survey area was defined as the area within the site, based on the boundary provided by ESB, including a 500m buffer around the site boundary (Figure 1).

2.5 Two VP locations within the site were identified at VP1 711772, 604442 (ITM) and VP2 711731, 604561 (ITM).

2.6 Based on the results of the desktop study a list of target species were identified. Target species included those listed as:

- Annex I of the Directive 2009/147/EEC referred to as the Birds Directive
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within the vicinity of the site
- Species protected under the fourth schedule of the Wildlife Acts 1976-2019 which are all raptors that occur in Ireland with the exception of buzzards, as explained below
- Red and amber listed Birds of Conservation Concern in Ireland (BoCCI) species with the exception of passerines

2.7 Secondary species included:

- Red and amber listed BoCCI passerine species in notable numbers
- Raven
- Green listed raptor species which were not listed on Annex I (i.e. buzzard)
- Gull species, in this case due to the location of the site gull flight lines over the coastline and within the VP survey area were too numerous to record as target species therefore they were recorded as secondary species
- As for above due to the location of the site, gannet flight lines over the sea but within the VP survey area were too numerous to record therefore they were recorded as target species therefore they were recorded as secondary species

2.8 Surveys were considered to follow an adapted methodology of 15 hours of VP surveys, in the format of one three-hour observation per month, undertaken at each VP location between November 2019 and March 2020. The survey on the 22 January 2020 was abandoned an hour early due to poor weather conditions.

2.9 Surveys were carried out at various times of day and were undertaken in a variety of weather conditions, mostly during conditions of at least moderate visibility (1-2 km). Watches usually comprised two sessions of three-hour observations, separated by a break of at least 30 minutes between sessions in order to avoid observer fatigue.

2.10 For each target species flight the following details were recorded:

- Species, age and sex (when identification of age and/or sex was possible);
- Number of birds;
- Time;
- Duration of flight within the survey area;
- Flying height in four defined height bands, corresponding approximately to below, at and two height bands above Rotor Swept Height (RSH) (0–23m, 23-75m, 75-100m and >100m), per 15 second interval;
- Bird behaviour; and

- Reason for end of the flight (either the bird landed or flew out of sight)

2.11 The flight path of each target species recorded was drawn as accurately as possible on to a large-scale map in the field. Each recorded flight path was numbered and cross-referenced to the flight data.

2.12 Secondary species were recorded in five-minute blocks. During each five-minute block of the VP survey, the minimum number of each species and the flight activity observed was recorded, including details of the height band and location of the birds (over the site or 500m buffer).

2.13 The weather conditions and times of each survey are presented in Appendix 1.

Table 1: VP survey dates

VP location	Date	Time
1	11/11/2019	13:30 – 16:30
	11/12/2019	08:32 – 11:32
	22/01/2020	14:05 – 16:12
	12/02/2020	07:51 – 10:51
	03/03/2020	15:25 – 18:25
2	12/11/2019	08:45 – 11:45
	11/12/2019	13:33 – 16:33
	22/01/2020	09:04 – 12:04
	11/02/2020	12:00 – 15:00
	04/03/2020	06:56 – 09:56

Winter bird walkover survey

2.14 Winter bird surveys were undertaken on four visits between November 2019 and March 2020 (Table 2). The winter bird survey area included all land within the site and additional 500m buffer (Figure 1), where accessible.

2.15 A walkover route was surveyed which encompassed all habitat types within the site. All amber-listed and red-listed BoCCI (Colhoun & Cummins, 2013) were recorded during these surveys and marked on suitably scaled maps in the field. Birds were detected through direct observation and bird song.

2.16 The weather conditions and times of each survey are presented in Appendix 2.

Table 2: Winter bird survey dates

Visit	Date	Time
1	11/11/2019	10:15 – 12:30
2	10/12/2019	10:12 – 12:16
3	11/02/2020	09:00 – 11:15
4	03/03/2020	10:50 – 13:00

3 RESULTS

Desk Study

Special Protection Areas (SPAs)

3.1 Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

3.2 The following SPAs occur in the vicinity of the site for which Special Conservation Interests (SCIs) of the European designated sites could occur within the survey area of the site (Figure 2).

Table 3: Special Protected Areas within 20km of the site.

SPA name and code	Distance from Carnsore Windfarm	Special Conservation Interests
Ladies Island Lake SPA [004009]	*c.* 300 m northwest	Gadwall (Anas strepera) [A051] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Sandwich Tern (*Sterna sandvicensis*) [A191] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194] Wetland and Waterbirds [A999]
Tacumshin Lake SPA (004092)	*c.* 4.4 km west	Little Grebe (*Tachybaptus ruficollis*) [A004] Bewick's Swan (*Cygnus columbianus bewickii*) [A037] Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Gadwall (*Anas strepera*) [A051] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Tufted Duck (*Aythya fuligula*) [A061] Coot (*Fulica atra*) [A125] Golden Plover (*Pluvialis apricaria*) [A140]

SPA name and code	Distance from Carnsore Windfarm	Special Conservation Interests
		Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Wetland and Waterbirds [A999]
Wexford Harbour and Slobs SPA (004076)	*c.* 9.7 km northwest	Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Bewick's Swan (*Cygnus columbianus bewickii*) [A037] Whooper Swan (*Cygnus cygnus*) [A038] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Mallard (*Anas platyrhynchos*) [A053] Pintail (*Anas acuta*) [A054] Scaup (*Aythya marila*) [A062] Goldeneye (*Bucephala clangula*) [A067] Red-breasted Merganser (*Mergus serrator*) [A069] Hen Harrier (*Circus cyaneus*) [A082] Coot (*Fulica atra*) [A125] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156]

SPA name and code	Distance from Carnsore Windfarm	Special Conservation Interests
		Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Lesser Black-backed Gull (*Larus fuscus*) [A183] Little Tern (*Sterna albifrons*) [A195] Greenland White-fronted Goose (*Anser albifrons flavirostris)* [A395] Wetland and Waterbirds [A999]
The Raven SPA (004019)	*c.* 14.1 km north	Red-throated Diver (*Gavia stellata*) [A001] Cormorant (*Phalacrocorax carbo*) [A017] Common Scoter (*Melanitta nigra*) [A065] Grey Plover (*Pluvialis squatarola*) [A141] Sanderling (*Calidris alba*) [A144] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetland and Waterbirds [A999]
Saltee Islands SPA (004002)	*c.* 14.5 km southwest	Fulmar (*Fulmarus glacialis*) [A009] Gannet (*Morus bassanus*) [A016] Cormorant (*Phalacrocorax carbo*) [A017] Shag (*Phalacrocorax aristotelis*) [A018] Lesser Black-backed Gull (*Larus fuscus*) [A183] Herring Gull (*Larus argentatus*) [A184] Kittiwake (*Rissa tridactyla*) [A188] Guillemot (*Uria aalge*) [A199] Razorbill (*Alca torda*) [A200] Puffin (*Fratercula arctica*) [A204]
Ballyteigue Burrow SPA (004020)	*c.* 15.6 km west	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Golden Plover (*Pluvialis apricaria*) [A140]

SPA name and code	Distance from Carnsore Windfarm	Special Conservation Interests
		Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Wetland and Waterbirds [A999]

Irish Wetland Bird Survey (I-WeBS)

3.3 I-WeBS data was received for Lady's Island Lake, which is the nearest I-WeBS site to Carnsore Windfarm, located *c.* 300 m to the west of Carnsore Windfarm. Records were returned for 41 species at Lady's Island Lake over the winter seasons 2014-15 to 2018-19. Peak numbers over this period for mute swan represent internationally important numbers, and an additional nine other species were recorded in nationally important numbers which included whooper swan, greylag goose, wigeon, gadwall, shoveler, little egret, coot, grey plover, black-tailed godwit. A summary of peak numbers recorded for all 41 species over the winter seasons 2014-15 to 2018-19 is presented in Appendix 3.

Previous surveys at Carnsore Point

3.4 *Tern Movements around Carnsore Point, Co. Wexford, May-July 1998; BirdWatch Ireland Conservation Report no. 98/3.* This study was undertaken to study the movements of terns and other seabirds in the vicinity of Carnsore Point and Lady's Island Lake after the Electricity Supply Board (ESB) announced its intention in 1998 to acquire the site at Carnsore Point for the development of a windfarm. The report discussed previous surveys conducted by BirdWatch Ireland, with full-time wardening commencing at Lady's Island Lake in 1993 which established two principal flight lines used by the terns when commuting to offshore feeding areas: one mostly to the east north-east of Lady's Island Lake and one more southerly down the length of the lake and across the shingle barrier.

3.5 In the 1998 study, the aim was to clarify the tern flight lines and identify destinations of the terns, both feeding areas and points where they regularly cross overland. Three of the first four sessions detected similar rates of terns passing east or west, usually in the range of 20-60 birds per hour. However, in session two, westerly passage was more pronounced with nearly 120 birds passing per hour. In all four sessions a higher proportion of terns cut across land when heading west. The fact that 14-66% of those birds were carrying fish indicated that these westerly flying birds were returning to the Lady's Island Lake colony to feed mates or chicks, having completed a foraging flight. It was concluded that tern passage across the ESB site was relatively infrequent and rarely involved the two species of greatest conservation concern (roseate and sandwich terns) but that conditions of thick fog or storms could potentially increase the risk of bird collisions with the turbines.

3.6 *Ornithological Monitoring at Carnsore Point, Co. Wexford, April-July 1999; BirdWatch Ireland, Conservation Report no.99/7.* In 1999 BWI were further commissioned to carry out more focussed observations on bird movements over the proposed development site and usage of the farmland and natural habitats on site by terrestrial birds. The findings were largely consistent with those of the 1998 report, and once again reaffirmed the conclusions that a windfarm constructed at the Carnsore Point site was unlikely to adversely affect breeding terns, especially sandwich tern and roseate tern. The study found very similar results for terrestrial breeding birds to those of Merne (1980) indicating relatively little change over the twenty-year period. In the report and in a national perspective, the site was deemed relatively rich in farmland and scrub species.

3.7 *Carnsore Point Windfarm Environmental Impact Statement (1999/2000).* This report was undertaken to examine the environmental impacts associated with the proposal to develop a windfarm at Carnsore Point, Co. Wexford. Bird surveys carried out between 1978 and 1980 at Carnsore Point and the surrounding area found the breeding bird community structure of the site areas to be similar to what would be expected in an Irish coastal site with similar constituents. Density of breeding birds was low, possibly due to the exposed nature of the site and lack of trees and tall scrub. Most species recorded were common in Ireland but noted the presence of tree sparrow and corn bunting due to them being scarce and local in Ireland, mainly confined to coastal areas. The report found that the rate of seabird passage and the species composition to be unremarkable. Much of the movement reflected flights of local breeding seabirds including sandwich, roseate, common and arctic terns. It was noted that much greater passage were found in several other coastal areas.

3.8 *Ornithological Monitoring at Carnsore Point Windfarm and Environs (2003)*. The first turbine at Carnsore Point was erected in June 2002 with all 14 in place by October 2002. The first year of monitoring was for the season from April 2002 to March 2003, which is the focus of this report. Monitoring was carried out at vantage points around Carnsore Point and at vantage points closer to the tern breeding colony at Lady's Island Lake. Results showed that tern movement across Carnsore Point was greatest between 12 May and 5 July 2002, spanning incubation and chick-rearing periods of common and arctic terns. A total of 921 terns were recorded, the majority common and arctic tern with relatively few sandwich or roseate terns recorded. Black-headed gull was the most frequently recorded species in the vicinity of the windfarm site. No collision-mortality was observed, and the construction and presence of the windfarm did not have any negative effects on passing seabirds particularly breeding terns. However, a dead meadow pipit *Anthus pratensis* was found on 29 June 2002. The report notes that emphasis should be placed on examining the area under the turbines after a fog event. The report concluded there was little effect of the windfarm on seabird passage. Particularly those breeding in the area, during this study period. The moving rotors of the turbines did not have any effect on flight patterns of terns and gulls moving between the colony and the sea.

3.9 *Ornithological Monitoring at Carnsore Point Windfarm and Environs (2004)*. Surveys for this report were undertaken between 06 April 2004 and 29 July 2004. A total of 994 terns were recorded at Carnsore Point, with the majority being common and arctic terns with lower numbers of sandwich terns and roseate terns. Tern movements across Carnsore Point was greatest between 8 June and 13 July 2004 spanning incubation and chick-rearing periods of common/arctic terns. Although no collision-mortality was observed, the

remains of a juvenile common tern was found near the base of turbine 12 on 28 July 2004 (and thought likely to be a result of collision with rotating blades). Birds were also observed altering flight paths as they approached the turbines the most notable being cormorant, black-headed gulls and black-backed gulls. Fog conditions were again noted in the report as posing a hazard for terns passing through the windfarm and recommended that the area under the turbines should be checked for corpses immediately after a fog event. Density of terrestrial birds using the site was 20% lower than the 2002 and 2003 surveys, and the diversity of birds recorded in 2003 was 24% lower than 2004 with eight species less being recorded.

3.10 *Ornithological Monitoring at Carnsore Point Windfarm and Environs (2005).* Surveys for this report were undertaken between 03 April 2005 and 31 July 2005. A total of 579 terns were recorded were recorded at Carnsore Point, with the majority being common and arctic terns with lower numbers of sandwich terns and roseate terns. Tern movements across Carnsore Point was greatest between 8 June and 13 July 2005 spanning incubation and chick-rearing periods of common and arctic terns. Although no collision-mortality was observed directly, the corpse of an adult Arctic Tern was found near the base of turbine 4 on 12 July 2005 (and thought likely to be a result of collision with rotating blades). Ground searches carried out immediately after four fog events revealed no casualties. Density of terrestrial birds using the site was 8% higher than the 2004 and 2003 surveys, and the diversity of birds recorded in 2005 was 20% higher than in 2004. two species, coal tit and greenfinch recorded in 2004, were not recorded in 2005. The report concludes that there was apparently little direct effect of the windfarm on seabird movements through the Carnsore area, particularly those breeding at Lady's Island Lake, during this study period. The moving rotors of the turbines did not have any notable effect on flight patterns of terns and gulls moving between the colony and the sea.

Table 4: A summary of Amber and Red listed BoCCI species, and Annex I bird species listed on the Birds Directive recorded during previous surveys at Carnsore Point are presented below.

Species	Amber listed BoCCI	Red listed BoCCI	Annex I of the Birds Directive
Sandwich Tern	✓		✓
Gannet	✓		
Cormorant	✓		
Shag	✓		
Greylag Goose	✓		
Shelduck	✓		
Common Scoter		✓	
Kestrel	✓		
Peregrine Falcon	✓		✓

Species	Amber listed BoCCI	Red listed BoCCI	Annex I of the Birds Directive
Oystercatcher	✓		
Ringed Plover	✓		
Lapwing		✓	
Black-headed Gull		✓	
Herring Gull		✓	
Great-black backed Gull	✓		
Roseate Tern	✓		✓
Common Tern	✓		✓
Arctic Tern	✓		✓
Black Tern			✓
Turtle Dove	✓		
Swift	✓		
Skylark	✓		
Swallow	✓		
Meadow Pipit		✓	
Robin	✓		
Stonechat	✓		
Wheatear	✓		
Greenfinch	✓		
Linnet	✓		
House Sparrow	✓		
Tree Sparrow	✓		
Starling	✓		
Corn Bunting	Extinct as a breeding species in Ireland[1]		
Petrels/ Shearwaters	✓	✓	✓
Skuas	✓		
Auks	✓		

[1] Corn bunting (Birdwatch Ireland, 2020). Available at https://birdwatchireland.ie/birds/corn-bunting/

Vantage point survey

Target species

3.11 Eight target species were recorded during VP surveys undertaken between November 2019 and March 2020. Below is an account of the activity of each target species recorded. See Appendix 4 for full details on each target species flight recorded.

Table 5: Monthly peak counts of target species recorded during VP surveys November 2019 to March 2020

Species	Conservation status	Nov	Dec	Jan	Feb	Mar
Cormorant	Amber Listed	1	2	1	2	4
Grey Heron	Green Listed	2	1	0	1	1
Whooper Swan	Amber Listed and Annex I species	0	5	0	0	0
Kestrel	Amber Listed	1	1	1	1	0
Snipe	Amber Listed	1	0	0	0	0
Curlew	Red Listed	9	3	0	0	0
Redshank	Amber Listed	10	0	0	0	1

3.12 Cormorant *Phalacrocorax carbo* is amber listed in Ireland. Cormorant were observed on a regular basis throughout the survey area over the winter period. A peak of 4 birds were recorded in March. The majority of the flights taking place along the eastern boundary of the site over the coast and not over land. 7.5% of cormorant flights occurred at or partially at Rotor Swept Height (RSH). The majority of flights were recorded below RSH. See Figure 3 for cormorant flight lines.

3.13 Grey heron *Ardea cinerea* is green listed in Ireland and is a SCI species for Wexford Harbour and Slobs SPA. A peak number of 2 birds were recorded in November. 20% of grey heron flights occurred at or partially at RSH. All remaining flights were recorded below RSH. See Figure 5 for grey heron flight lines.

3.14 Whooper swan *Cygnus Cygnus* is amber listed in Ireland. A peak number of 5 birds were recorded in December. One flight was recorded on site flying northwest, while the second flight was just beyond the site boundary and flew south before circling back and flying north. One flight was recorded at RSH while the second flight was below RSH. See Figure 5 for whooper swan flight lines.

3.15 Kestrel *Falco tinnunculus* is amber listed in Ireland. Kestrel was observed on a regular basis throughout the survey area over the winter period. All flights pertained to single birds either hunting or flying over the site. The majority of flights were recorded within the site. 18% of kestrel flights occurred at or partially at RSH. All remaining flights were recorded below RSH. See Figure 4 for kestrel flight lines.

3.16 Snipe *Gallinago gallinago* is amber listed in Ireland. Only one snipe was recorded in flight during the survey period, and it was recorded in November. The flight was on site to the west and it was below RSH. See Figure 5 for snipe flight line.

3.17 Curlew *Numenius arquata* is red-listed in Ireland. Curlew were only observed in November and December during this survey. A peak number of 9 birds were recorded in November. These flights were mainly in the northern section of the site with one along the southern end of the site. None of the recorded curlew flights occurred at or partially at RSH. All flights were recorded below RSH. See Figure 5 for curlew flight lines.

3.18 Redshank *Tringa totanus* is amber listed in Ireland. A peak number of 10 birds were recorded in November. 66% of redshank flights occurred at or partially at RSH. The remaining flight was recorded below RSH. See Figure 5 for redshank flight lines.

Secondary species

3.19 Ten secondary species were recorded during VP surveys undertaken between November 2019 and March 2020. Below is an account of activity of secondary species recorded which have been grouped into subdivisions of similar species.

Table 6: Monthly peak counts of secondary species recorded during VP surveys November 2019 to March 2020

Species	Conservation status	Nov	Dec	Jan	Feb	Mar
Gannet	Amber Listed	13	4	1	0	1
Buzzard	Green Listed	2	1	2	1	1
Black-headed Gull	Red Listed	10	15	2	2	20
Common Gull	Amber Listed	0	0	0	0	2
Lesser Black-backed Gull	Amber Listed	3	7	1	5	3
Herring Gull	Red Listed	16	2	2	20	20
Great Black-backed Gull	Amber Listed	7	4	13	15	4
Mixed flock of gulls (Great Black-backed / Herring Gull)	Amber/ Red Listed	-	-	-	50	-
Little Egret	Green Listed	1	0	0	0	1
Starling	Amber Listed	60	0	0	0	50

Seabirds

3.20 Black-headed gull *Larus ridibundus* were recorded in every month with a peak number of 20 birds recorded in March. 70% of flights were recorded on site with the remaining 30% made within the buffer. 68% of black-headed gull flights occurred below RSH, while the remaining 32% occurred at or partially at RSH.

3.21 Common gull *Larus canus* were recorded in March with a peak number of 2 birds. 100% of these flights were recorded on site. All of these flights were recorded on site. All flights recorded occurred below RSH.

3.22 Great black-backed gull *Larus marinus* were recorded in every month with a peak number of 15 birds observed in February. 45% of flights were recorded on site with the remaining 55% made within the buffer. 87% of great black-backed gull flights occurred below RSH, 11% occurred at or partially at RSH while the remaining 2% of flights occurred at above RSH.

3.23 Herring gull *Larus argentatus* were recorded in every month with a peak number of 20 birds observed in both February and March. 62% of flights were recorded on site with the remaining 38% made within the buffer. 78% of herring gull flights occurred below RSH, while the remaining 22% of flights occurred at or partially at RSH.

3.24 Lesser black-backed gull *Larus fuscus* were recorded in every month with a peak number of 7 birds observed in December. 59% of flights were recorded on site with the remaining 41% made within the buffer. 59% of lesser black-backed gull flights occurred below RSH, while the remaining 41% of flights occurred at or partially at RSH.

3.25 Gannet *Morus bassanus* were recorded in every month except February. A peak number of 13 birds were observed in November. 35% of flights were recorded on site with the remaining 65% recorded within the buffer. Of gannet flights recorded, 37.5% occurred below RSH, 37.5% occurred at or partially at RSH while the remaining 25% of flights occurred at above RSH.

Raptors

3.26 Buzzard *Buteo buteo* were recorded in every month with peak number of 2 birds observed in both November and January. 2% of flights were recorded on site with the remaining 8% made within the buffer. Of buzzard flights recorded, 64% occurred below RSH, 32% occurred at or partially at RSH while the remaining 4% of flights occurred at above RSH.

Passerines

3.27 Starling *Sturnus vulgaris* were recorded in September and March surveys. A peak number of 60 birds were observed in November. 100% of flights were recorded on site. All starling flights recorded occurred below RSH.

Herons

3.28 Little egret *Egretta garzetta* were recorded in September and March surveys. One flight of one individual bird was recorded in both months. Both of these flights were recorded on site. All little egret flights recorded occurred below RSH.

Winter walkover survey

3.29 A total of 16 species were recorded during the winter walkover surveys, of which 14 are of conservation concern (Annex I, Red and Amber listed species). Generally passerine species including linnet, meadow pipit, stonechat and starling, were recorded in hedgerows, scrub and agricultural fields. Raptors, including buzzard and kestrel, were

recorded on the western side of the site over grassland habitat. Seabirds, mainly gull species and one great northern diver, were recorded mainly to the west of the site along the coast or flying over western fields. Wader species, including oystercatcher, redshank and snipe, were recorded in wet grassland and scrub habitats in the east of the site and along the western coastal side of the site.

Table 7: Monthly peak counts of species recorded during winter walkover surveys November 2019 to March 2020

Species	Conservation status	Nov	Dec	Feb	Mar
Great Northern Diver	Amber Listed	0	0	1	0
Cormorant	Amber Listed	0	0	1	0
Buzzard	Green Listed	0	0	0	1
Kestrel	Amber Listed	0	1	1	0
Oystercatcher	Amber Listed	6	0	3	0
Snipe	Amber Listed	1	1	1	5
Redshank	Red Listed	0	3	2	0
Black-headed Gull	Red Listed	0	0	2	0
Herring Gull	Red Listed	0	0	3	0
Great Black-backed Gull	Amber Listed	0	1	5	0
Lesser Black-backed Gull	Amber Listed	0	1	0	0
Meadow Pipit	Red Listed	3	1	6	3
Stonechat	Amber Listed	1	0	0	3
Linnet	Amber Listed	15	0	0	0
Starling	Amber Listed	40	20	0	40

4 REFERENCES

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FIGURES

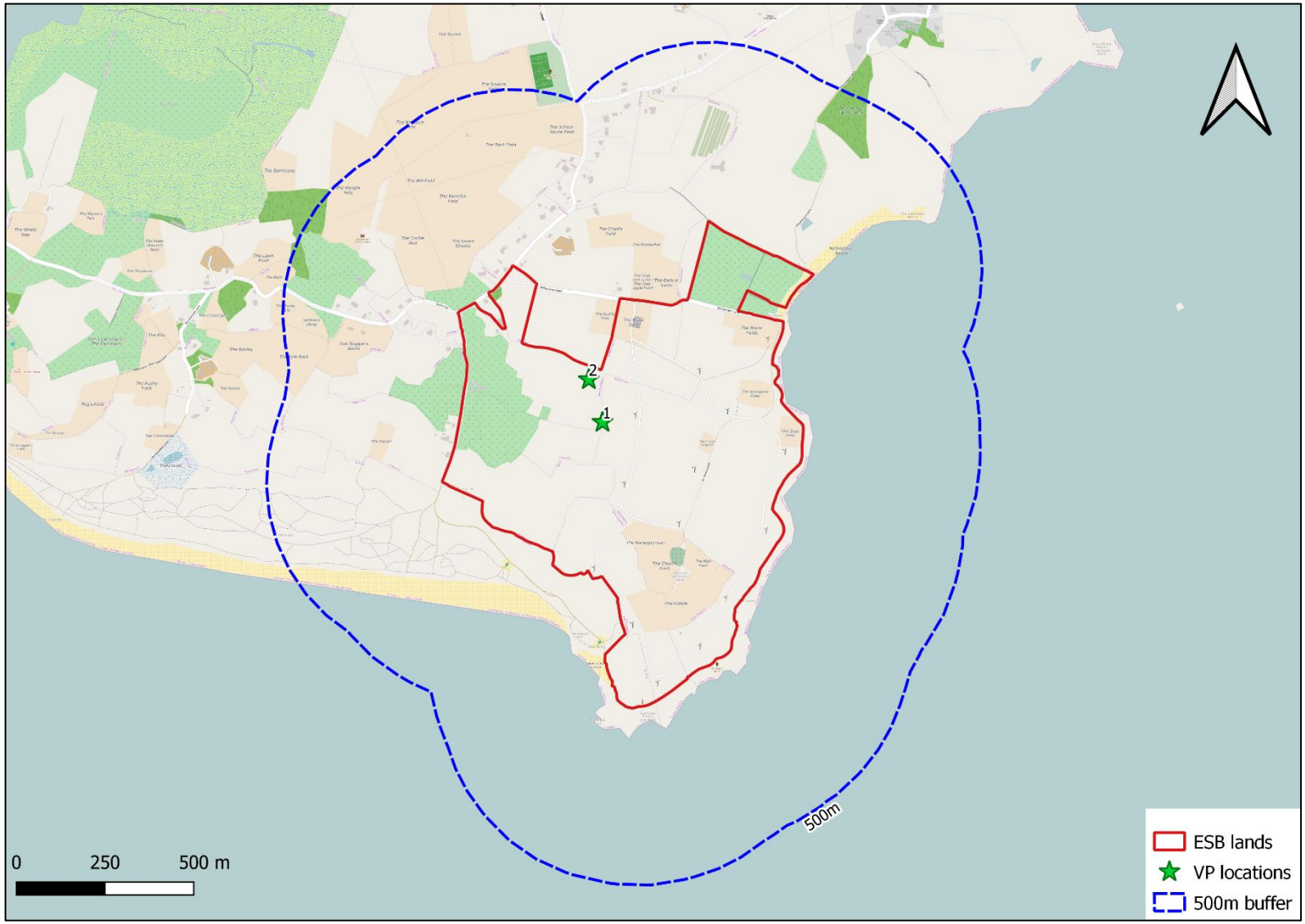

Figure 1: Ornithological survey area

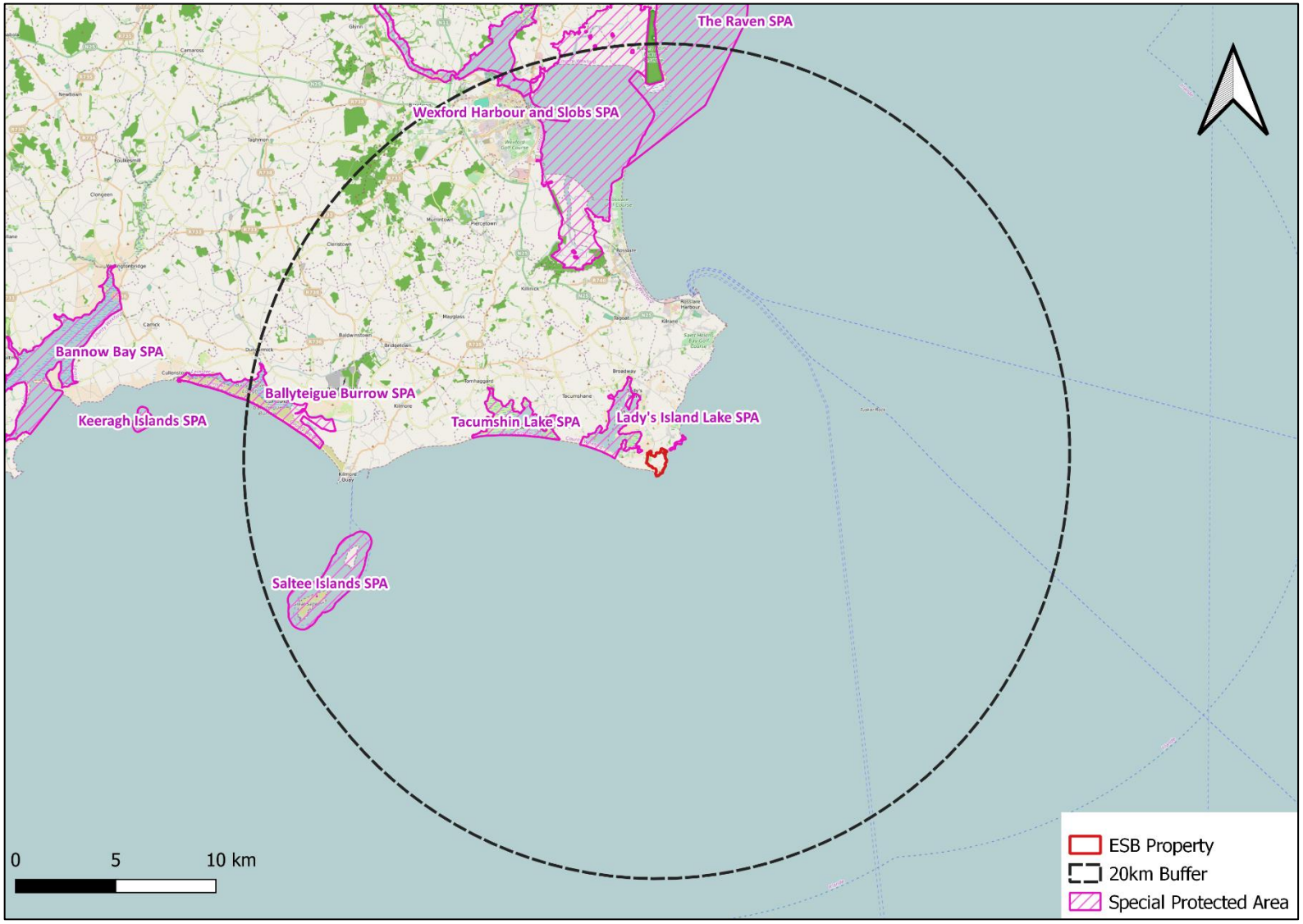

Figure 2: Special Protected Areas within 20km of the site

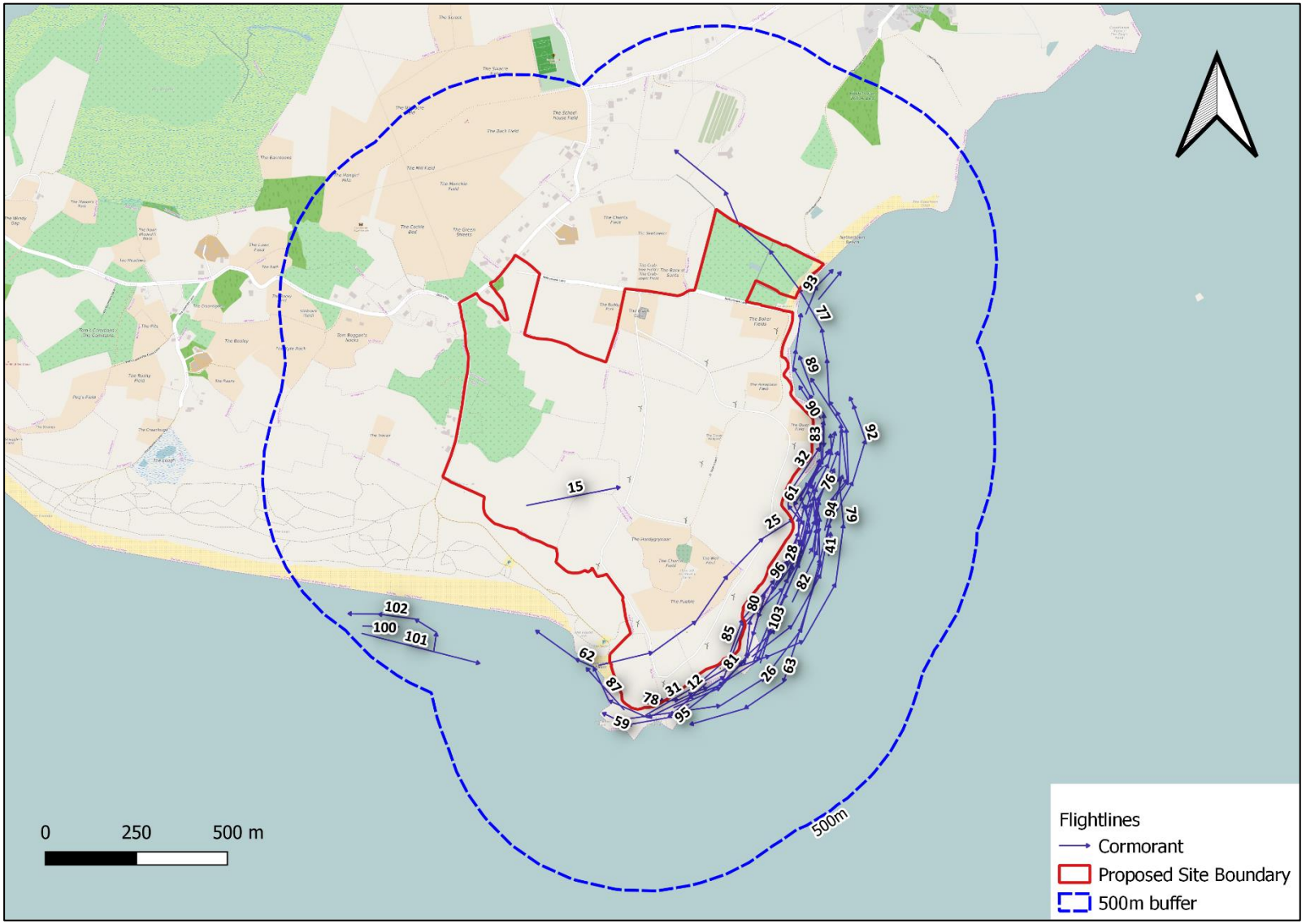

Figure 3: Cormorant Flight Lines

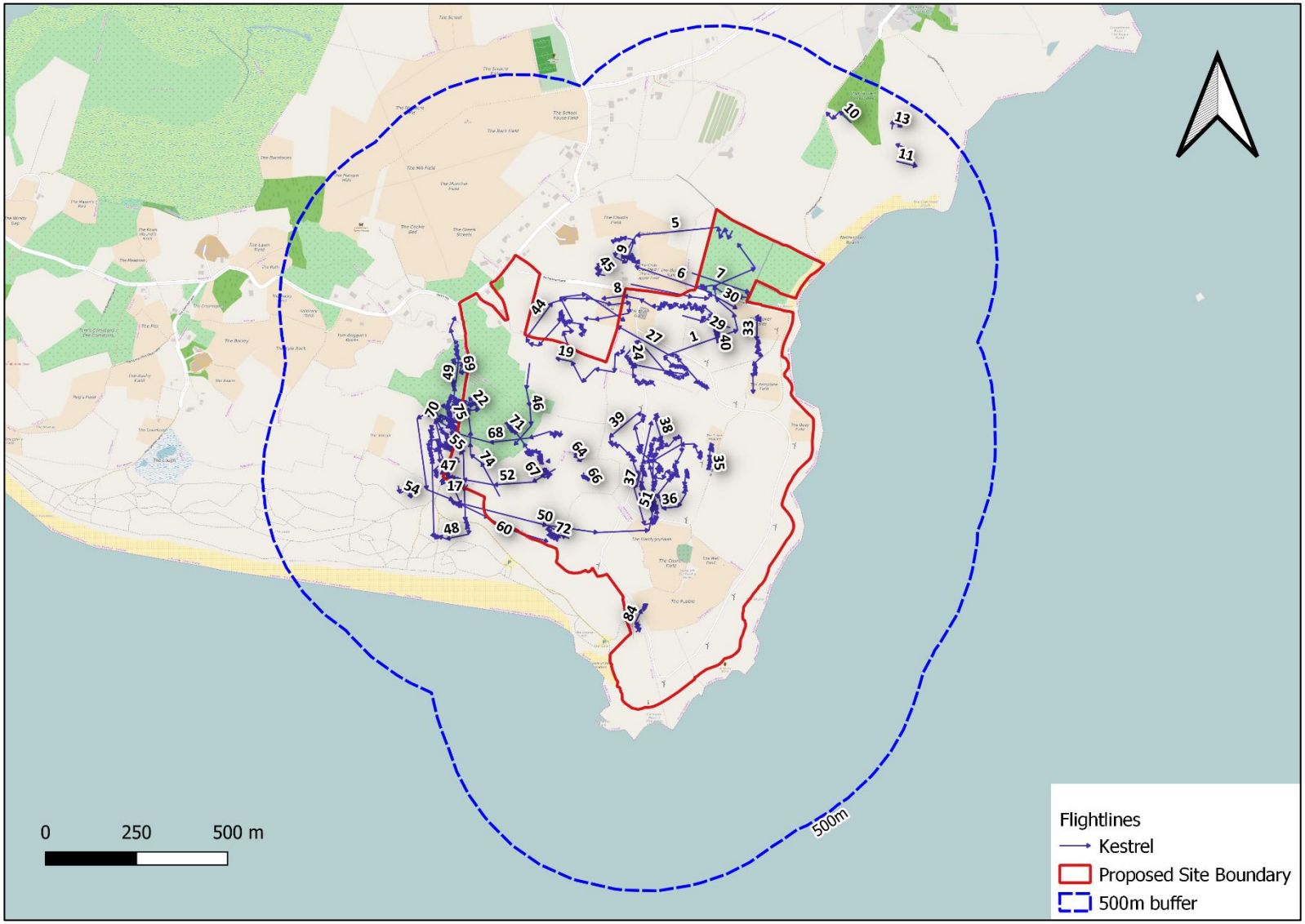

Figure 4: Kestrel Flight Lines

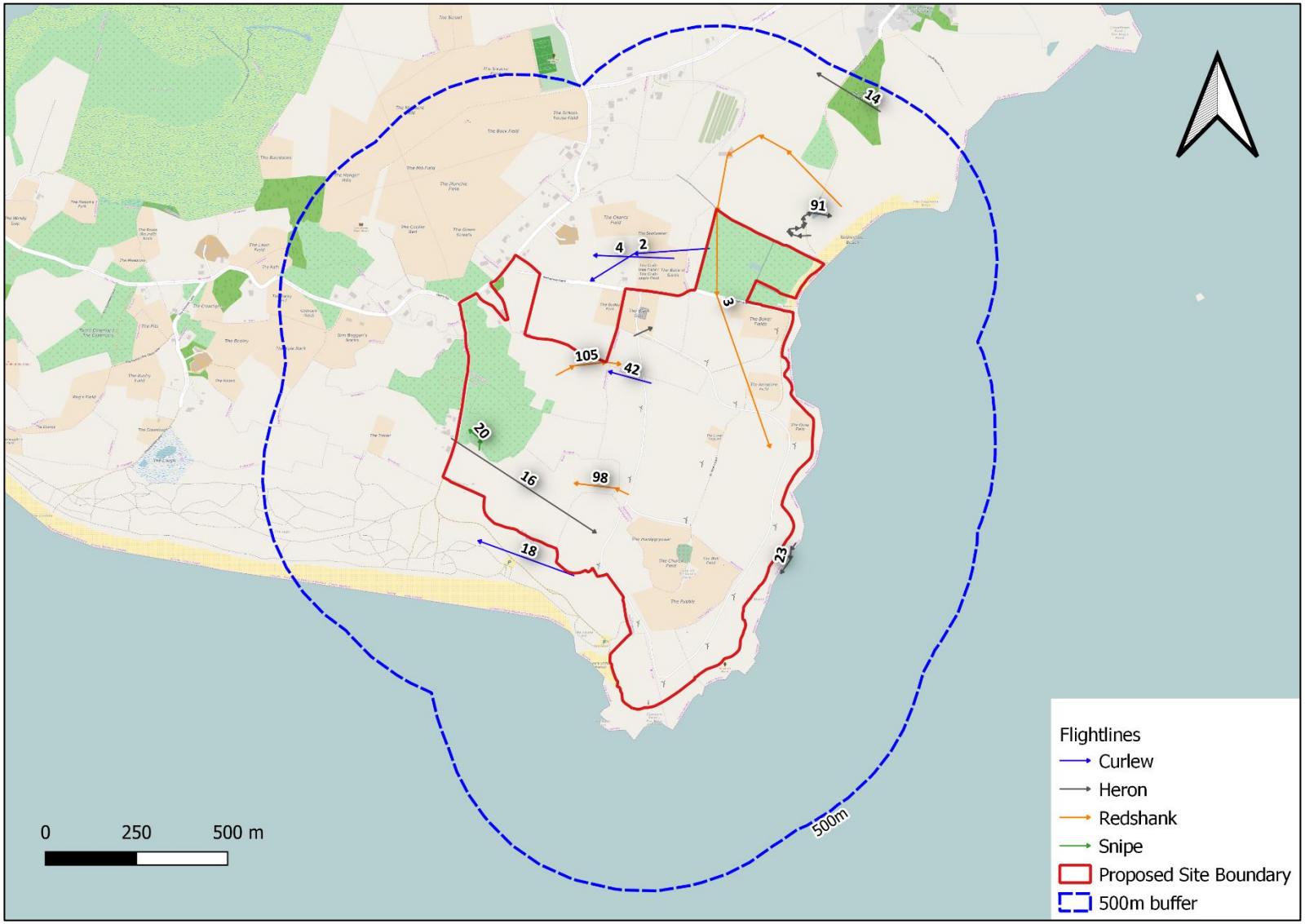

Figure 5: Curlew, Heron, Redshank, Snipe and Whooper Swan Flight Lines.

APPENDIX 1 WINTER VP WEATHER DATA

Table 8: Winter Weather Data for Vantage Point Surveys from November 2019 To March 2020

Date	VP	Observer	Start time	Finish time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Sunrise	Sunset
11/11/2019	1	MMW	13:30	16:30	1	8	W	0	1	2	2	0	0		16:40
11/11/2019	1	MMW	13:30	16:30	2	8	W	0	1	2	2	0	0		16:40
11/11/2019	1	MMW	13:30	16:30	3	8	W	0	0	2	2	0	0		16:40
11/12/2019	1	CK	08:32	11:32	1	3	SW	0	6	0	2	0	0	08:25	
11/12/2019	1	CK	08:32	11:32	2	4	SW	0	4	0	2	0	0	08:25	
11/12/2019	1	CK	08:32	11:32	3	4	SW	0	2	0	2	0	0	08:25	
22/01/2020	1	CK	14:05	16:12	1	4	NE	0	7	1	2	0	0		16:53
22/01/2020	1	CK	14:05	16:12	2	4	NE	0	7	1 to 0	1 to 0	0	0		16:53
22/01/2020	1	CK	14:05	16:12	3	3	NE	0	8	1	0	0	0		16:53
12/02/2020	1	CK	07:51	10:51	1	4	SW	0	2	1	2	0	0	07:48	
12/02/2020	1	CK	07:51	10:51	2	3	SW	0	4	1	2	0	0	07:48	
12/02/2020	1	CK	07:51	10:51	3	3	SW	0	5	1	2	0	0	07:48	
03/03/2020	1	CK	15:25	18:25	1	2	SW	2	4	1	2	0	0		18:07
03/03/2020	1	CK	15:25	18:25	2	2	SW	0	6	1	2	0	0		18:07
03/03/2020	1	CK	15:25	18:25	3	2	SW	0	7	1	2	0	0		18:07
12/11/2019	2	MMW	08:45	11:45	1	8	W	0	1	1	2	0	0	07:40	
12/11/2019	2	MMW	08:45	11:45	2	7	W	0	2	1	2	0	0	07:40	
12/11/2019	2	MMW	08:45	11:45	3	6	W	0	4	1	2	0	0	07:40	
11/12/2019	2	CK	13:33	16:33	1	5	SW	0	3	0	2	0	0		16:13
11/12/2019	2	CK	13:33	16:33	2	6	SW	0	3	0	2	0	0		16:13
11/12/2019	2	CK	13:33	16:33	3	6 or 7	SW	0	3	0	2	0	0		16:13
22/01/2020	2	CK	09:04	12:04	1	1	NE	0	7	1	2	0	0	08:21	
22/01/2020	2	CK	09:04	12:04	2	2	NE	0	7	1	2	0	0	08:21	
22/01/2020	2	CK	09:04	12:04	3	3	NE	0	7	1	2	0	0	08:21	
11/02/2020	2	CK	12:00	15:00	1	6	SW	2	6	0	2	0	0		
11/02/2020	2	CK	12:00	15:00	2	7	SW	2	6	0	2	0	0		
11/02/2020	2	CK	12:00	15:00	3	7	SW	0	5	0	2	0	0		
04/03/2020	2	CK	06:56	09:56	1	2	SW	4	8	1	1	0	0	07:04	
04/03/2020	2	CK	06:56	09:56	2	2	SW	4	8	1	1	0	0	07:04	

04/03/2020	2	CK	06:56	09:56	3	2	SW	4	8	1	1	0	0	07:04	

Table 9: Weather condition variables

Wind speed				**Rain**		**Cloud Height**		**Cloud Cover**	In eighths **1/8, 2/8 etc.**	
0	Calm	**7**	Mod. gale	None	**0**	<150m	**0**			
1	Light air	**8**	Fresh gale	Drizzle/Mist	**1**	150-500m	**1**	**Frost**	None	**0**
2	Light breeze	**9**	Strong gale	Light showers	**2**	>500m	**2**		Onsite	**1**
3	Gentle breeze	**10**	Whole gale	Heavy showers	**3**				High Ground	**2**
4	Mod. breeze	**11**	Storm	Light Rain	**4**	**Visibility**				
5	Fresh breeze	**12**	Hurricane	Heavy rain	**5**	Poor (<1km)	**0**	**Snow**	None	**0**
6	Strong breeze					Moderate (1-2km)	**1**		Onsite	**1**
Wind Direction		16 point compass: **N, NNE, NE, ENE, E etc.**				Good (>2km)	**2**		High ground	**2**

APPENDIX 2 WINTER WALKOVER WEATHER DATA

Table 10: Winter Weather Data for Walkover Surveys from November 2019 To March 2020

Date	Observer	Start time	Finish time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
11/11/2019	MMW	10:15	12:30	1	8	W	0	0	2	2	0	0
11/11/2019	MMW	10:15	12:30	2	8	W	0	1	2	2	0	0
11/11/2019	MMW	10:15	12:30	3	7	W	0	2	2	2	0	0
10/12/2019	CK	10:12	12:16	1	10	SW	1	8	0	0	0	0
10/12/2019	CK	10:12	12:16	2	10	SW	1	8	0	0	0	0
10/12/2019	CK	10:12	12:16	3	10 to 11	SW	1	8	0	0	0	0
11/02/2020	CK	09:00	11:15	1	5	SW	0	2	1	2	0	1
11/02/2020	CK	09:00	11:15	2	6	SW	2	3	1	2	0	0
03/03/2020	CK	10:50	13:00	1	2	SW	0	2	1	2	0	0
03/03/2020	CK	10:50	13:00	2	2	SW	0	2	1	2	0	0
03/03/2020	CK	10:50	13:00	3	2	SW	0	2	1	2	0	0

APPENDIX 3 SUMMARY OF I-WEBS DATA FOR LADY'S ISLAND LAKE

Table 11: Summary of I-WeBS data for Lady's Island Lake

I-WeBS Site Code	Species	Latin Name	1% National	1% International	2014/15	2015/16	2016/17	2017/18	2018/19	Mean 14/15-18/19	Peak 14/15-18/19
0O402	Mute Swan	Cygnus olor	90	100	39	333	363	449	377	312.20	449
0O402	Bewick's Swan	Cygnus columbianus	20	220			2			0.40	2
0O402	Whooper Swan	Cygnus cygnus	150	340	18	7	161	209	91	97.20	209
0O402	Greylag Goose	Anser anser	35	980	132	65	128	146	90	112.20	146
0O402	Light-bellied Brent Goose	Branta bernicla hrota	350	400	28			140		33.60	140
0O402	Shelduck	Tadorna tadorna	100	2500	15	28	7	21		14.20	28
0O402	Wigeon	Anas penelope	560	14000	844	1219	1572	647	520	960.40	1572
0O402	Gadwall	Anas strepera	20	1200	22	117	43	35	22	47.80	117
0O402	Teal	Anas crecca	360	5000	34	13	39	3	88	35.40	88
0O402	Mallard	Anas platyrhynchos	280	53000	153	167	99	132	88	127.80	167
0O402	Pintail	Anas acuta	20	600			4			0.80	4
0O402	Shoveler	Anas clypeata	20	650		45	64		57	33.20	64
0O402	Pochard	Aythya ferina	110	2000	2	90	8	16		23.20	90
0O402	Tufted Duck	Aythya fuligula	270	8900	235	3	109	74	40	92.20	235
0O402	Little Grebe	Tachybaptus ruficollis	20	4700	8	9	6	2	8	6.60	9
0O402	Great Crested Grebe	Podiceps cristatus	30	6300	6	6	1	4	1	3.60	6
0O402	Cormorant	Phalacrocorax carbo	110	1200	10	13	19	10	37	17.80	37
0O402	Little Egret	Egretta garzetta	20	1100	35	25	23	21	48	30.40	48
0O402	Grey Heron	Ardea cinerea	25	5000	11	14	10	10	16	12.20	16
0O402	Moorhen	Gallinula chloropus			17	8	10	3	5	8.60	17
0O402	Coot	Fulica atra	190	15500	40	98	345	390	466	267.80	466
0O402	Oystercatcher	Haematopus ostralegus	610	8200	23	19	31	21	7	20.20	31
0O402	Ringed Plover	Charadrius hiaticula	120	540	21	1			4	5.20	21
0O402	Golden Plover	Pluvialis apricaria	920	9300	57	14	340		300	142.20	340
0O402	Grey Plover	Pluvialis squatarola	30	2000				1450		290.00	1450

0O402	Lapwing	Vanellus vanellus	850	72300	700	300	168	550	205	384.60	700
0O402	Dunlin	Calidris alpina	460	13300	5	29	1		74	21.80	74
0O402	Snipe	Gallinago gallinago			1		10		3	2.80	10
0O402	Black-tailed Godwit	Limosa limosa	200	1100	360	102	368	280	296	281.20	368
0O402	Bar-tailed Godwit	Limosa lapponica	170	1500		1			2	0.60	2
0O402	Whimbrel	Numenius phaeopus				11				2.20	11
0O402	Curlew	Numenius arquata	350	7600	40	230	101	63	16	90.00	230
0O402	Greenshank	Tringa nebularia	20	3300			1	1	1	0.60	1
0O402	Redshank	Tringa totanus	240	2400	50	16	32	31	16	29.00	50
0O402	Turnstone	Arenaria interpres	95	1400	3	3			2	1.60	3
0O402	Black-headed Gull	Chroicocephalus ridibundus			1040	2425	1419	1302	245	1,286.20	2425
0O402	Common Gull	Larus canus				4		11	1	3.20	11
0O402	Lesser Black-backed Gull	Larus fuscus				2			4	1.20	4
0O402	Herring Gull	Larus argentatus			6	87	1	11	6	22.20	87
0O402	Great Black-backed Gull	Larus marinus			7	7	7	8	18	9.40	18
0O402	Kingfisher	Alcedo atthis			1					0.20	1

APPENDIX 4 TARGET SPECIES FLIGHT DETAILS

Table 12: Winter 2019/2020 Vantage Point Survey Results for Target Species Flight Details

Flight No.	Date	VP	Flight start time	BTO code	Min No. of birds	Flight duration (secs)	Height Info at 15 second intervals																										Behaviour		End of flight	
							0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	390	Transit	Foraging/Hunting	Landed	Flew out of sight
1	11/11/19	1	13:53	K.	1	124	1	1	1	1	1	1	1	1	1																			✓		✓
2	11/11/19	1	13:56	CU	8	47	1	1	1	1																							✓			✓
3	11/11/19	1	14:07	RK	10	64	1	2	2	2	1																						✓			✓
4	11/11/19	1	14:23	CU	9	33	1	1	1																								✓			✓
5	11/11/19	1	14:26	K.	1	284	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	2	2									✓		✓
6	11/11/19	1	14:41	K.	1	230	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1												✓		✓
7	11/11/19	1	15:05	K.	1	49	1	1	1	1																								✓		✓
8	11/11/19	1	15:08	K.	1	260	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1										✓		✓
9	11/11/19	1	15:29	K.	1	41	1	1	1	1																								✓		✓
10	11/11/19	1	15:59	K.	1	21	2	2																										✓		✓
11	11/11/19	1	16:09	K.	1	22	2	2																										✓		✓
12	11/11/19	1	16:09	CA	1	15	2	2																									✓			✓
13	11/11/19	1	16:16	K.	1	23	1	1																										✓		✓
14	11/11/19	1	16:25	H.	1	30	1	1	1																								✓			✓
15	12/11/19	2	08:59	CA	1	30	3	3	3																								✓			
16	12/11/19	2	09:30	H.	1	45	2	2	2	2																							✓			✓
17	12/11/19	2	10:02	K.	1	72	1	1	1	1	1																							✓	✓	
18	12/11/19	2	10:46	CU	2	32	1	1	1																								✓			
19	12/11/19	2	11:05	K.	1	60	1	1	1	1	1																							✓		✓
20	12/11/19	2	11:09	SN	1	18	1	1																									✓			
21	12/11/19	2	08:55	CA	1	30	1	1	1																								✓			
22	12/11/19	2	11:25	K.	1	105	1	2	2	1	1	1	1	1																						✓
23	11/12/19	1	08:36	H.	1	15	1	1																									✓			✓
24	11/12/19	1	08:40	K.	1	135	1	1	1	1	1	1	1	1	1	1																		✓	✓	
25	11/12/19	1	08:54	CA	1	90	2	2	2	1	1	1	1																				✓		✓	
26	11/12/19	1	09:00	CA	1	60	1	1	1	1	1																						✓		✓	
27	11/12/19	1	09:03	K.	1	120	1	1	1	1	1	1	1	1	1																			✓	✓	
28	11/12/19	1	09:16	CA	2	15	1	1																									✓			✓
29	11/12/19	1	09:18	K.	1	30	1	1	1																									✓	✓	
30	11/12/19	1	09:20	K.	1	135	1	1	1	1	1	1	1	1	1	1																		✓	✓	
31	11/12/19	1	09:28	CA	1	15	1	1																									✓			✓
32	11/12/19	1	09:34	CA	1	45	1	1	1	1																							✓			✓

33	11/12/19	1	09:41	K.	1	60	1	1	1	1	1																						✓		✓
34	11/12/19	1	09:44	WS	5	45	2	2	2	2																							✓		✓
35	11/12/19	1	09:49	K.	1	180	1	1	1	1	1	1	1	1	1	1	1	1	1	1														✓	✓	
36	11/12/19	1	09:58	K.	1	255	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1										✓	✓	
37	11/12/19	1	10:04	K.	1	15	1	1																									✓			✓
38	11/12/19	1	10:18	K.	1	60	1	1	1	1	2																							✓		✓
39	11/12/19	1	10:21	K.	1	360	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1		✓		✓
40	11/12/19	1	10:35	K.	1	90	1	1	1	1	1	1	1																					✓	✓	
41	11/12/19	1	10:38	CA	1	15	1	1																										✓		✓
42	11/12/19	1	11:09	CU	3	15	1	1																									✓			✓
43	11/12/19	1	11:16	CA	1	15	1	1																									✓			✓
44	11/12/19	2	13:42	K.	1	255	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												✓	✓	
45	11/12/19	2	13:45	K.	1	30	1	1	1																									✓	✓	
46	11/12/19	2	13:50	K.	1	45	1	1	1	1																							✓			✓
47	11/12/19	2	14:04	K.	1	60	1	1	1	1	1																							✓		✓
48	11/12/19	2	14:07	K.	1	375	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		✓		✓
49	11/12/19	2	14:14	K.	1	255	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									✓		✓
50	11/12/19	2	14:22	K.	1	390	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	✓	✓	
51	11/12/19	2	14:28	K.	1	15	1	1																										✓		✓
52	11/12/19	2	14:33	K.	1	15	1	1																										✓		✓
53	11/12/19	2	15:38	K.	1	<15	1																											✓		✓
54	11/12/19	2	15:42	K.	1	45	1	1	1	1																								✓		✓
55	11/12/19	2	15:59	K.	1	75	1	1	1	1	1																							✓		✓
56	11/12/19	2	16:00	K.	1	15	1	1																										✓		✓
57	11/12/19	2	16:02	WS	5	45	1	1	1	1																							✓			✓
58	11/12/19	2	16:04	CA	2	30	1	1	1																								✓			✓
59	11/12/19	2	16:26	CA	1	30	1	1	1																								✓			✓
60	22/01/20	2	11:12	K.	1	30	1	1	1																								✓		✓	
61	22/01/20	1	14:12	CA	1	30	1	1	1																								✓			✓
62	22/01/20	1	14:19	CA	1	30	1	1	1																								✓			✓
63	22/01/20	1	14:59	CA	1	60	1	1	1	1	1																						✓			✓
64	11/02/20	2	12:11	K.	1	<15	1																											✓	✓	
65	11/02/20	2	12:19	K.	1	30	1	1	1																									✓	✓	
66	11/02/20	2	12:23	K.	1	30	1	1	1																									✓	✓	
67	11/02/20	2	12:24	K.	1	180	1	1	1	1	1	1	1	1	1	1	1	1	1	1														✓	✓	
68	11/02/20	2	12:32	K.	1	210	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												✓	✓	
69	11/02/20	2	12:37	K.	1	30	1	1	1																									✓	✓	
70	11/02/20	2	12:39	K.	1	45	1	1	1	1																								✓	✓	
71	11/02/20	2	12:41	K.	1	120	1	1	1	1	1	1	1	1	1																			✓	✓	
72	11/02/20	2	13:05	K.	1	60	1	1	1	1	1																							✓	✓	
73	11/02/20	2	13:17	K.	1	15	1	1																										✓	✓	
74	11/02/20	2	13:25	K.	1	30	1	1	1																								✓		✓	
75	11/02/20	2	13:42	K.	1	165	1	1	1	1	1	1	1	1	1	1	1	1	1															✓	✓	
76	12/02/20	1	07:58	CA	2	15	1	1																									✓			✓
77	12/02/20	1	08:21	CA	2	60	1	1	1	1	1																						✓			✓
78	12/02/20	1	08:24	CA	1	60	1	1	1	1	1																						✓		✓	
79	12/02/20	1	08:27	CA	2	90	1	1	1	1	1	1	1																				✓			✓
80	12/02/20	1	08:32	CA	1	15	1	1																									✓			✓
81	12/02/20	1	08:33	CA	1	30	1	2	2																								✓			✓
82	12/02/20	1	08:37	CA	2	30	1	1	1																								✓		✓	

83	12/02/20	1	08:37	CA	1	<15	1																										✓		✓	
84	12/02/20	1	08:41	K.	1	180	1	1	1	1	1	1	1	1	1	1	1	1	1															✓		✓
85	12/02/20	1	08:43	CA	2	15	1	1																									✓			✓
86	12/02/20	1	08:50	CA	1	15	1	1																									✓			✓
87	12/02/20	1	09:04	CA	1	<15	1																										✓			✓
88	12/02/20	1	09:18	CA	1	15	1	1																									✓			✓
89	12/02/20	1	09:25	CA	1	<15	1																										✓			✓
90	12/02/20	1	09:27	CA	1	15	1	1																									✓			✓
91	12/02/20	1	09:29	H.	1	60	1	1	1	1	1																						✓			✓
92	12/02/20	1	09:33	CA	1	120	1	1	1	1	1	1	1	1	1																		✓			✓
93	12/02/20	1	10:15	CA	1	15	1	1																									✓			✓
94	12/02/20	1	10:34	CA	1	30	1	1	1																								✓			✓
95	03/03/20	1	16:12	CA	1	15	1	1																									✓			✓
96	03/03/20	1	16:32	CA	1	60	1	1	1	1	1																						✓			✓
97	03/03/20	1	16:42	CA	1	15	1	1																									✓			✓
98	03/03/20	1	16:44	RK	1	<15	2																										✓			✓
99	04/03/20	2	09:35	H.	1	15	1	1																									✓			✓
100	04/03/20	2	08:42	CA	4	30	1	1	1																								✓		✓	
101	04/03/20	2	08:47	CA	4	45	1	1	1	1																							✓			✓
102	04/03/20	2	08:47	CA	2	15	1	1																									✓			✓
103	04/03/20	2	08:52	CA	5	120	1	1	1	1	1	1	1	1	1																			✓		✓
104	04/03/20	2	08:57	CA	3	60	1	1	1	1	1																							✓	✓	
105	04/03/20	2	09:23	RK	1	30	1	1	1																								✓			✓

BTO Code	Species
CA	Cormorant
CU	Curlew
H.	Grey Heron
K.	Kestrel
RK	Redshank
SN	Snipe
WS	Whooper Swan