ESB

Carnsore Wind Farm

Natura Impact Statement in support of the Appropriate Assessment – REV00

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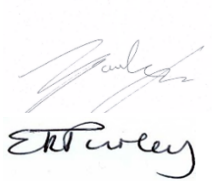
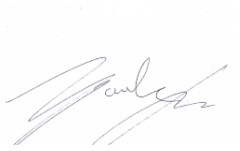
Signature		Signature	
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1 INTRODUCTION

1.1 Background

This Natura Impact Statement (NIS) in support of the Appropriate Assessment (AA) has been produced by RSK for the proposed application for planning permission by ESB to Wexford County Council in relation to the proposed extension of time application for the operational Carnsore wind farm (Carnsore Point, Co. Wexford).

This report has been prepared in accordance with the requirements of Article 6(3) of the EU Habitats Directive. An Appropriate Assessment is required if significant effects on European sites, arising from a proposed development, cannot be ruled out at the screening stage. A Stage 1 Screening assessment was carried out for RSK by Scott Cawley Ltd in May 2021 (refer to Appendix 1). The Screening Report concluded that:

'*Following an examination, analysis and evaluation of the best available information, and applying the precautionary principle, it can be concluded that there is the possibility for significant effects on the following European sites, either arising from the project alone or in combination with other plans and projects, as a result of habitat degradation and species mortality arising from hydrological and hydrogeological impacts, habitat degradation as a result of introducing/spreading non-native invasive species, disturbance and displacement impacts, and, bird mortality as a result of continued collision risk impact: Carnsore Point SAC, Lady's Island Lake SAC, Tacumshin Lake SAC, Saltee Islands SAC, Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, and Saltee Islands SPA*.

In reaching this conclusion, the nature of the project and its potential relationship with all European sites within the zone of influence, and their conservation objectives, have been fully considered.

Therefore, it is the professional opinion of the authors of this report that the application for consent for the proposed development does require an Appropriate Assessment and the preparation of a Natura Impact Statement (NIS)'.

1.2 Legislation

The Council Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora ('The Habitats Directive') provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species through the establishment and conservation of an EU-wide network of Natura 2000 sites (also known as 'European sites'). Natura 2000 sites form a network of areas designated to conserve natural habitats and species that are rare, endangered, vulnerable or endemic within the European Community. This includes SACs (designated under the Habitats Directive) and SPAs (classified under Directive 2009/147/EC on the Conservation of Wild Birds; the 'Birds Directive'). Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects with potential to affect Natura 2000 sites. Article 6(3) establishes the key requirement for AA as follows:

'Any plan or project not directly connected with or necessary to the management of the (Natura 2000) site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment

of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

If, in spite of a negative assessment of the implications for the (Natura 2000) site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.'

1.3 Guidance

This NIS has been prepared in accordance with the following guidance:

- OPR Practice Note PN01. Appropriate Assessment Screening for Development Management (Office of the Planning Regulator, 2021).
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 revision).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2001).
- Communication from the Commission on the precautionary principle (European Commission, 2000).
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (European Commission, 2019).

1.4 Stages of Appropriate Assessment

As set out in the guidance documents above, Appropriate Assessment is split into four distinct stages:

Stage 1: *Screening is the first stage of the process and identifies the likely impacts upon a European site of a project (either alone or in combination). Mitigation cannot be taken into consideration at this stage of the AA process. If the screening exercise concludes that likely significant effects cannot be ruled out, then Appropriate Assessment (Stage 2 of the process, see below) must be undertaken. It is important to note that the burden of evidence is to demonstrate, on the basis of objective information, that there will be no significant effect; if the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment*

Stage 2: *Appropriate Assessment looks at the implications of the effects of the proposals for the site's conservation objectives (alone and in combination). At this stage, it needs to be determined, beyond reasonable scientific doubt, whether or not there will be adverse effects on the integrity of the site. This stage also includes the development of mitigation measures to avoid or reduce any possible impacts.*

Stage 3: *Assessment of alternative solutions is the process which examines alternative ways of achieving the objectives of the project that would avoid adverse impacts on the integrity of a European site, should the avoidance or mitigation measures detailed at the Appropriate Assessment stage be insufficient to cancel out adverse effects.*

Stage 4: *Assessment where no alternative solutions exist and where adverse impacts remain. An assessment is made as to whether or not the development is necessary for Imperative Reasons of Overriding Public Interest (IROPI). If it is, this stage also involves detailed assessment of the compensatory measures needed to protect and maintain the overall coherence of the Natura 2000 network.*

2 THE PROPOSED DEVELOPMENT

The existing wind farm became operational in 2003 and the current application seeks to extend this for a further 15 years from the date of expiration (August 2022) of the current An Bord Pleanála (ABP) permission (ABP Ref. PL26.116487).

The existing wind farm (and associated infrastructure) was constructed in accordance with Hibernian Wind Powers specifications and requirements. All elements of the planning application are pre-existing, and it is not proposed to make any alterations to the current site layout, wind turbines or associated infrastructure.

The existing site comprises:

- 14 no. Vestas 850-kilowatt (kW) wind turbines with a maximum overall blade tip height of 75 metres (m).
- 1 no. 38 kilovolt (kV) permanent electrical substation and control building with total footprint of approximately 569 square metres (m^2), including welfare facilities, associated electrical plant and equipment, security fencing, associated underground cabling and a septic tank.
- 1 no. permanent meteorological mast with a maximum height of 50m, an associated 153m^2 fenced compound containing an 18m^2 site cabin, with an air monitoring mast of 10m total height.
- All associated underground electrical and communications cabling connecting the turbines to the on-site substation.
- Existing site access roads of 3.23 kilometres (km) approximate total length, 5 no. car parking spaces, 14 no. turbine hardstands and approximately 760m of walking tracks.
- Existing gated site entrance way from Nethertown Lane (local public road).
- Site drainage.
- Associated site fencing and signage.

A full description of the Proposed Development is provided in Appendix 3.

3 BASELINE INFORMATION

The following existing sources of information have been used to inform the assessment:

- Ornithology study carried out at Carnsore Point by Bird Watch Ireland (BWI) in 1998 and 1999 (BWI, 1998 and BWI, 1999).
- Ornithological Monitoring Reports carried out at Carnsore wind farm from 2003 to 2005 (Adamson, 2003; Daly 2004; and Daly 2005).
- Carnsore Point Wind Farm Environmental Impact Statement (EIS) produced in 1999/2000 (EBS Power Generation, 1999/2000).
- Breeding and wintering bird survey carried out in 2020/2021 (refer to Appendix 2).
- AA Screening Report (refer to Appendix 1).
- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) (www.npws.ie).

3.1 European sites

The Stage 1 Screening assessment (refer to Appendix 1) identified eight SACs and six SPAs, as set out in Table 4-1, with the potential for impact-receptor pathways with the Proposed Development.

Table 3-1 European sites within 15km of the Proposed Development

European Site	Distance from Proposed Development
Lady's Island Lake SAC	The Proposed Development lies within the European site boundary
Carnsore Point SAC	The Proposed Development lies immediately adjacent to the European site boundary
Tacumshin Lake SAC	c. 3.8km west
Saltee Islands SAC	c. 9.2km west
Long Bank SAC	c. 9.6km north
Blackwater Bank SAC	c. 9.6km north
Slaney River Valley SAC	c. 12.5km northwest
Ballyteige Burrow SAC	c. 14.7km west
Lady's Island Lake SPA	c. 300m north west
Tacumshin Lake SPA	c. 4.4km west
Wexford Harbour and Slobs SPA	c. 9.7km north west
The Raven SPA	c. 14.1km north
Saltee Islands SPA	c. 14.5km south west
Ballyteige Burrow SPA	c. 15.6km west

Further details of the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) is provided in Appendix I of the Screening Report (refer to Appendix 1). Figures 1 to 4 taken from the Screening Report (refer to Appendix 1) show the location of the European sites in the vicinity of the Proposed Development.

Figure 3-1 SACs in the vicinity of the Proposed Development

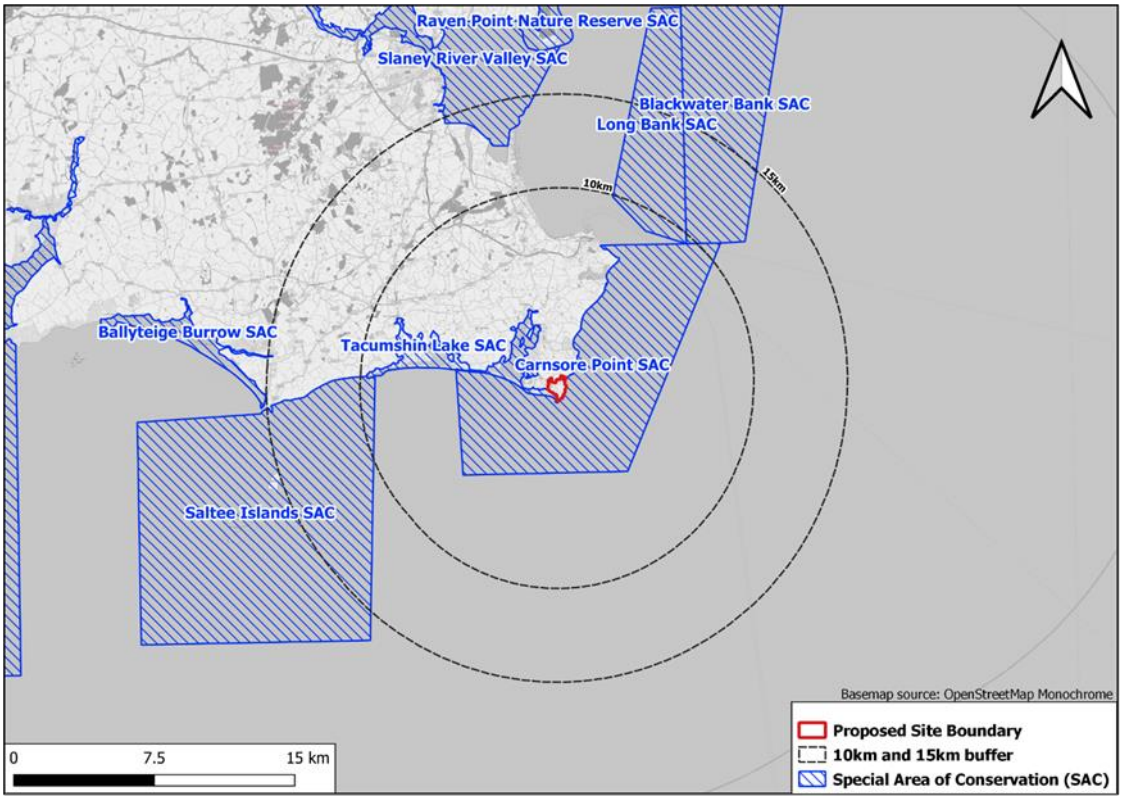


Figure 3-2 The Proposed Development in relation to Lady's Island Lake SAC and Carnsore Point SAC

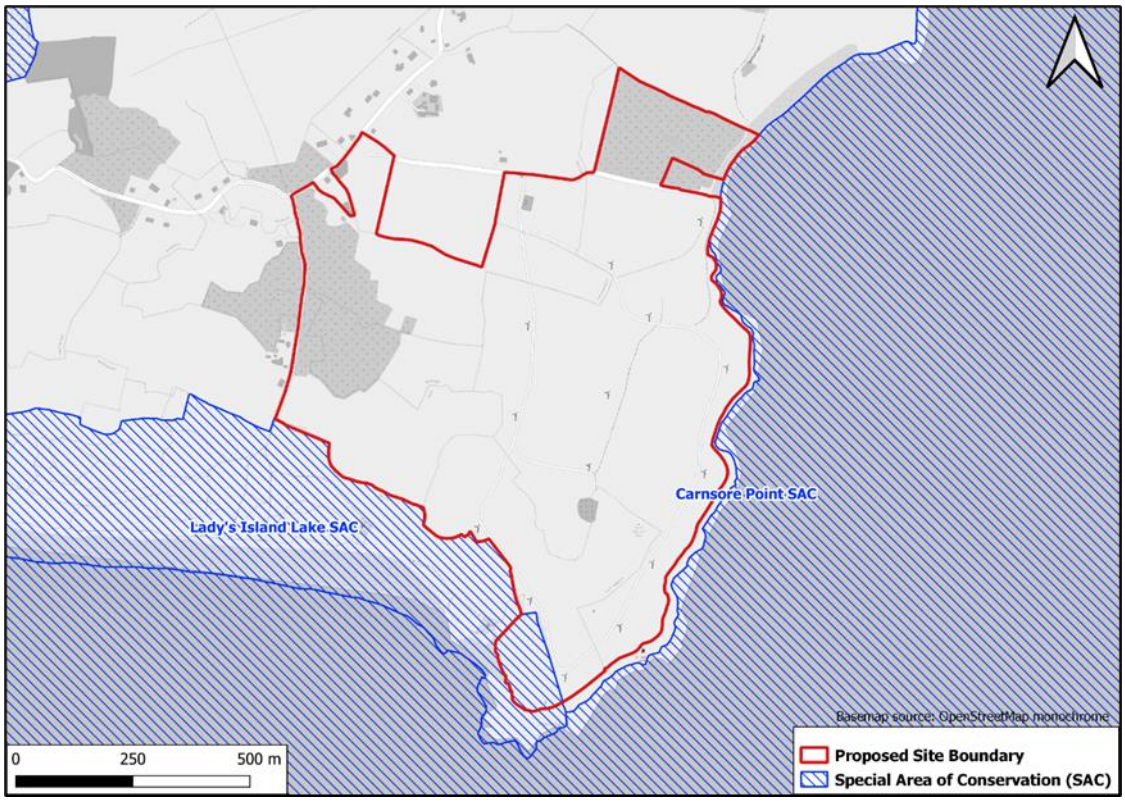


Figure 3-3 SPAs in the vicinity of the Proposed Development

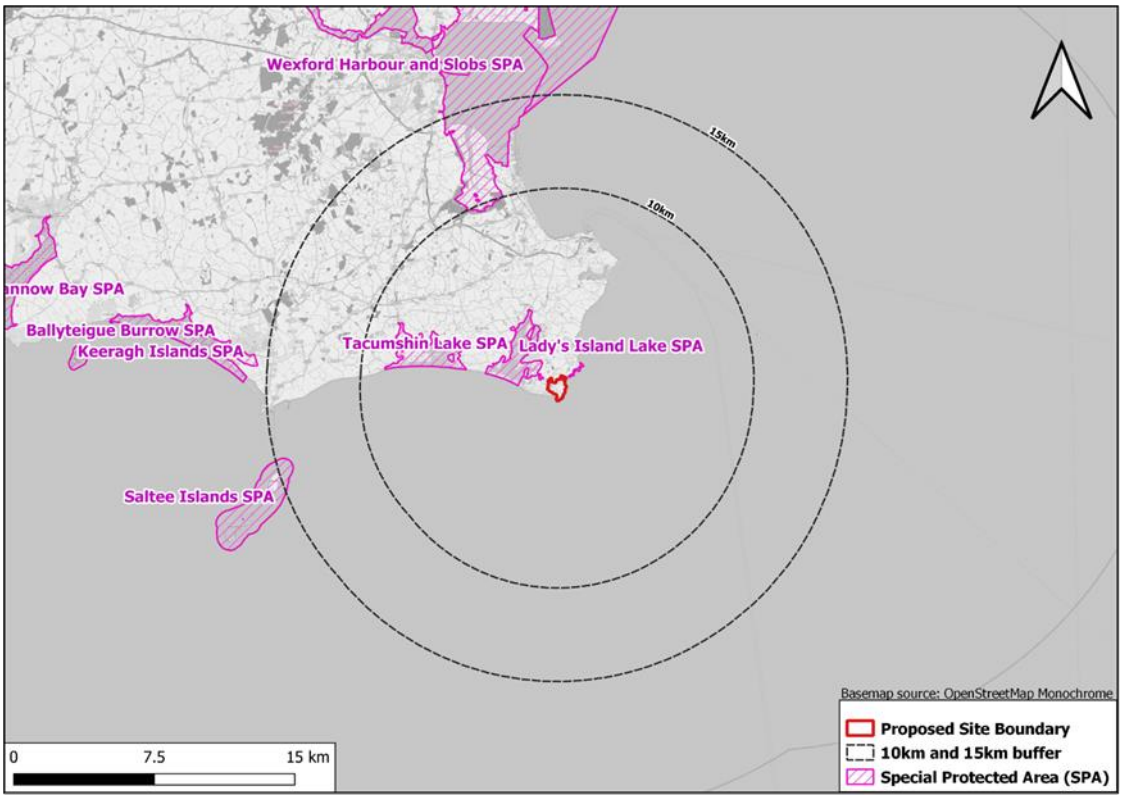
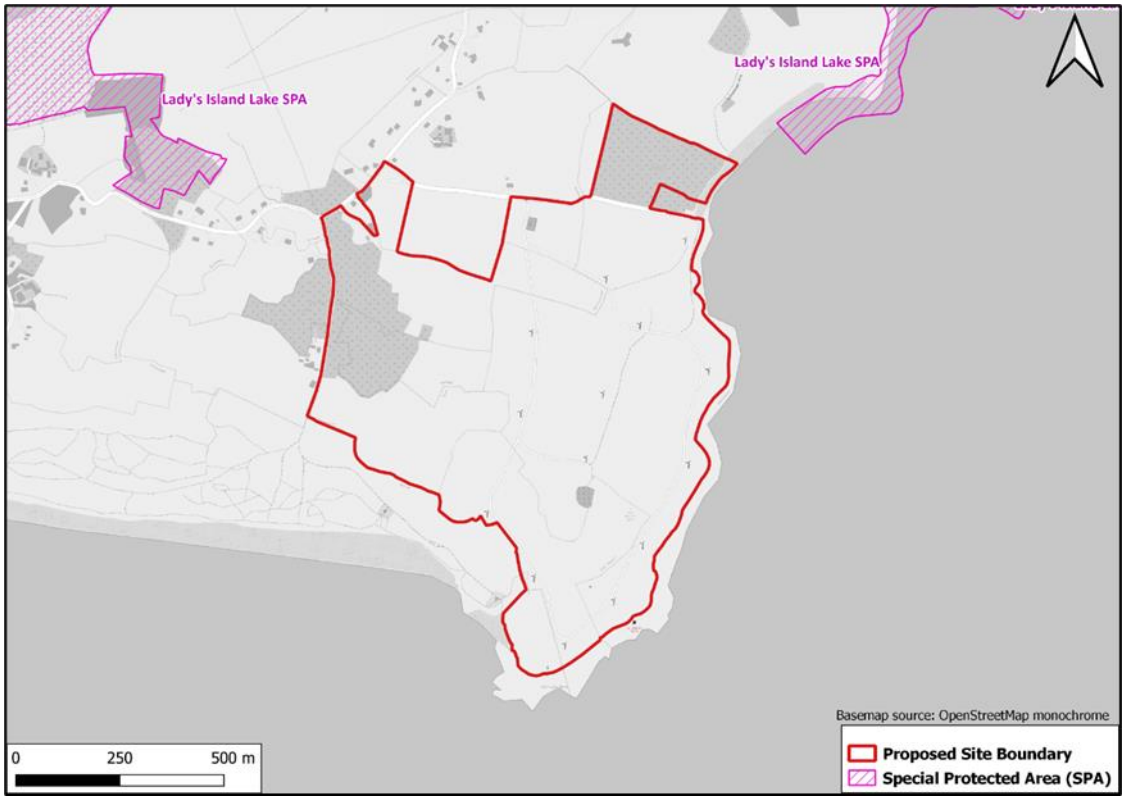


Figure 3-4 The Proposed Development in relation to Lady's Island Lake SPA



3.2 Historic baseline

Surveys carried out by BWI in 1998 (BWI, 1998) were undertaken to study the movements of terns and other seabirds in the vicinity of Carnsore Point and Lady's Island. 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. It was concluded that tern passage across the Proposed Development site was relatively infrequent and rarely involved the two species of greatest conservation concern (roseate tern (*Sterna dougallii*) and sandwich tern (*Sterna sandvicensis*)), but that conditions of thick fog or storms could potentially increase the risk of these birds flying through the wind farm area. In 1999, BWI were commissioned to carry out further, more focussed observations of bird movements (BWI, 1999). The findings were largely consistent with those of the 1998 report (BWI, 1998) and reaffirmed the conclusions that a wind farm constructed at the Carnsore Point site was unlikely to adversely affect breeding terns, especially sandwich and roseate terns.

Bird surveys carried out to inform the Carnsore Point Wind Farm Environmental Impact Statement (EBS Power Generation, 1999/2000) found the rate of seabird passage and the species composition to be unremarkable. Much of the movement reflected flights of local breeding seabirds, including sandwich tern, roseate tern, common tern (*Sterna hirundo*) and Arctic tern (*Sterna paradisaea*), but flight numbers and details were not provided. It was noted that much greater numbers of passage birds were found in several other coastal areas. Overall, the conclusion of the impact assessment was that

there were unlikely to be significant effects on bird species, but monitoring in 2003, 2004 and 2005 would be carried out to provide evidence to confirm this conclusion.

3.3 Post-construction monitoring

Results from the first monitoring surveys in 2003 (Adamson, 2003) showed that tern movement across Carnsore Point was greatest between May and July, spanning the incubation and chick-rearing periods of common and Arctic terns. A total of 921 tern flights were recorded during the monitoring period, the majority of which were common and Arctic tern, with relatively few sandwich or roseate terns recorded. Black-headed gull (*Chroicocephalus ridibundus*) was the most frequently recorded species in the vicinity of the wind farm site, but no collision-related mortality was observed, and the construction and presence of the wind farm did not have any discernible negative effects on passing seabirds, including breeding terns.

Monitoring in 2004 (Daly, 2004) showed results broadly similar to 2003. A total of 994 tern flights were recorded during the monitoring period, with the majority being common and Arctic terns and with lower numbers of sandwich terns and roseate terns. Tern movements across Carnsore Point was greatest spanning the incubation and chick-rearing periods of common/Arctic terns. Although no collision-mortality was observed, the remains of a juvenile common tern were found near the base of a turbine (thought likely to be a result of collision with the turbine). Birds were also observed altering flight paths as they approached the turbines, the most notable being cormorant (*Phalacrocorax carbo*), black-headed gulls and black-backed gulls (*Larus sp.*). Fog conditions were noted in the report as posing a hazard for terns passing through the wind farm.

Monitoring undertaken in 2005 (Daly, 2005) was broadly similar for the previous two years and although no collision-mortality was observed directly, the corpse of an adult Arctic tern was found near the base of a turbine (and thought likely to be a result of collision with the turbine). With the recording of only two dead terns (due to colliding with a turbine), the 2005 monitoring report (Daly, 2005) concluded that: '*there was apparently little direct effect of the wind farm 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 appear to have any notable effect on flight patterns of terns and gulls moving between the breeding colony and the sea. Also, the positioning of the turbines relative to each other is such that there is a fair distance between each turbine, so birds have ample opportunity to negotiate a route through them.*'

3.4 Current ornithological baseline

A complete year of bird surveys was carried out between 2019 and 2020 (refer to Appendix 2) covering the breeding and wintering seasons.

The breeding bird surveys recorded Arctic tern, dunlin (*Calidris alpina*), little egret (*Egretta garzetta*) and sandwich tern, but they were not considered to be breeding within or directly adjacent to the Proposed Development site. Wader species, including

oystercatcher (*Haematopus ostralegus*), turnstone (*Arenaria interpres*), dunlin and curlew (*Numenius arquata*), were recorded using the wet grassland and scrub habitats in the west of the site and along the eastern coastal side of the site.

During the breeding season Vantage Point (VP) surveys, birds were observed to avoid, navigate or continue to use the air space not occupied by the existing turbines and turning blades to forage, hunt and commute. Notably, sandwich tern and common tern were recorded regularly commuting through the operating wind farm, travelling between offshore feeding sites and breeding colonies at Lady's Island Lake SPA. While other tern species, Arctic tern and roseate tern, appeared to avoid flying through the operating wind farm. Avoidance of flights through the operating wind farm area was noted by cormorant, and by grey heron (*Ardea cinerea*), little egret, curlew, barnacle goose (*Branta leucopsis*) and grey plover (*Pluvialis squatarola*).

During the wintering walkover surveys, seabirds, including gull species and one great northern diver (*Gavia immer*), were recorded mainly to the west of the site along the coast or flying over western fields. Wader species, including oystercatcher, redshank (*Tringa totanus*) and snipe (*Gallinago gallinago*) were recorded in wet grassland and scrub habitats in the east of the site and along the western coastal side of the site. During the winter VP surveys, cormorant, grey heron, whooper swan (*Cygnus cygnus*), snipe, curlew, redshank, gannet (*Morus bassanus*), black-headed gull, common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*) and great black-backed gull (*Larus marinus*) as well as little egret were recorded flying within and adjacent to the site; however, the majority of flight lines were either above or below the rotor sweep height.

In addition, bat casualty searches were also undertaken monthly between July and October 2020 (refer to Chapter 6 of the EIAR, MKO, 2021). The bat casualty searches covered a radius of 30m under each turbine, which was systematically searched by surveyors walking a tight grid over the area and using sticks to search in the vegetation for bat carcasses. Any incidental observations of bird casualties were also noted during these surveys.

4 STAGE 2 – APPROPRIATE ASSESSMENT

4.1 Introduction

The main objective of this stage (Stage 2) of the NIS is to determine whether the Proposed Development would result in significant adverse effects on the European sites with respect to the site's structure, function and/or conservation objectives. The following section therefore looks at the potential impact-receptor pathways from the Proposed Development on the European sites screened into the Appropriate Assessment (refer to Appendix 1).

4.2 Conservation objectives

The conservation objectives for a European site are intended to represent the aims of the Habitats Directive and Birds Directive in relation to that site. Habitats and species of European Community importance should be maintained or restored to 'favourable conservation status' (FCS), as defined in Article 1 of the Habitats Directive below:

The conservation status of a natural habitat will be taken as 'favourable' when:

- Its natural range and the area it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- Conservation status of typical species is favourable as defined in Article 1(i).

The conservation status of a species will be taken as favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

4.3 Construction and Decommissioning Phases

As described within Section 2, all elements of the project are pre-existing and it is not proposed to make any alterations to the current site layout, wind turbines or associated infrastructure. As a result, there will be no construction associated with the Proposed Development and therefore there would be no potential impact-receptor pathways (and therefore no adverse effects on the integrity of any European sites and their ability to meet their conservation objectives) resulting from construction phase activities such as habitat loss; disturbance/ displacement of SPA qualifying bird species; hydrological/ hydrogeological change; and the introduction or spreading of non-native invasive species.

In relation to decommissioning, Condition 9 of the original Planning Application (ABP Ref. PL26.116487) states the following:

'*On full or partial decommissioning of the wind farm or if the wind farm ceases operation for a period of more than one year the masts and turbines concerned (including foundations) shall be dismantled and removed from the site. The site shall be reinstated (including all access roads) and all decommissioned structures shall be removed within three months of decommissioning*.'

The impacts associated with the decommissioning phase activities (described in Condition 9) were fully assessed in the EIS (EBS Power Generation, 1999/2000). The current plan for decommissioning would include leaving the turbine foundations and cabling in place underground and the site roadways remaining in situ. The potential impact-receptor pathways associated with the revised plan, if taken forward at the time of decommissioning, would be less than those assessed in the EIS (EBS Power Generation, 1999/2000). This would be subject to a separate planning application (including agreeing a decommissioning plan with the local authorities) and therefore the decommissioning phase does not need to be considered further in this Appropriate Assessment.

4.4 Operational Phase

The potential impact-receptor pathways identified for the operational phase include the following:

- **Hydrological and hydrogeological change** – potential risk of pollution incidents leading to habitat degradation of nearby SAC/ SPA habitat and/ or species mortality as a result of habitat degradation.
- **Disturbance/ displacement** – potential risk of disturbance/ displacement of SPA bird species as a result of noise and/or the physical presence of the wind farm.
- **Collision risk** - Bird mortality as a result of collision with turbines.

4.4.1 Hydrological and hydrogeological change

The operational wind farm does not entail the storage on site of any materials or liquids likely to cause a pollution incident. As detailed in the project description, there will be no ground disturbing works associated with the operational phase, no natural drainage features will be altered and there will be no direct or indirect discharges to natural watercourses during the continued operation of the wind farm. The only potential impact-receptor pathway could occur through pollution incidents from staff welfare facilities and vehicles entering the site. However, wastewater from the staff welfare facilities in the control buildings is managed by means of an existing septic tank with no untreated foul water discharged into adjacent surface or coastal waters. The existing septic tank will continue to be maintained according to current best practice guidance and is inspected and maintained at regular intervals. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended), will be employed to transport wastewater away from the site to a licensed facility. The only other potential for spillages arises from maintenance vehicles visiting the site. All such vehicles are regularly maintained in good working condition and park on areas of hard standing away from surface water features. **The continued operation of the wind farm would not have any adverse effects (in relation to**

hydrological and hydrogeological change) on the integrity of any European sites and their ability to meet their conservation objectives.

4.4.2 Disturbance/ displacement

There is the potential for impact-receptor pathways associated with: noise from the continued operation of the turbines; and the physical presence of the turbines which could disturb/ displace birds present in the in the vicinity of the wind farm site.

As detailed in Sections 5.3 and Section 5.5, results of the post-construction monitoring (Adamson, 2003; Daly, 2004; and Daly, 2005) and more recent surveys (refer to Appendix 2) conducted during the operational phase of the wind farm, these show that birds are still utilising the area within and adjacent to the turbines. A similar suite of species has been recorded during the pre- and post – construction periods, suggesting that birds are still choosing to use the area around the wind farm and have become habituated to the presence of the turbines. Monitoring data (2002 to 2016) (Daly et al. 2011; Daly et al. 2012; Daly et al. 2016) for the closest SPA to the Proposed Development (Lady's Island Lake SPA) has shown that there has been no significant decrease in breeding populations of the respective SCI species. As these turbines have been in place since 2002, it is considered birds have had sufficient time to become habituated and accustomed to the noise and physical presence of them. **The continued operation of the wind farm would not have any adverse effects (in relation to disturbance/ displacement due to the potential noise and physical presence of the turbine structures) on the integrity of any European sites and their ability to meet their conservation objectives.**

4.4.3 Collision risk

There is always an inherent risk of bird species colliding with turbines, particularly for coastal wind farms during periods of poor visibility. If the wind farm remains operational, collision will continue to pose a risk to birds utilising habitats within and adjacent to the wind farm area. However, potential impact-receptor pathways associated with collision risk would only be relevant to those SPA species recorded utilising the habitat within and adjacent to the wind farm site. Table 4-1 below provides a summary of those sites/ species that have been recorded during the surveys and therefore require consideration in the Appropriate Assessment.

Table 4-1 Summary of sites/ species recorded during the surveys

Designated site	Summary of species recorded
Lady's Island Lake SPA (300m) north west	Black-headed gull, sandwich tern, roseate tern, common tern and Arctic tern were regularly observed during both the post-construction monitoring and the recent breeding and winter surveys. On a number of occasions more than 1% of the SPA populations was recorded. In addition, the carcass searches identified a young juvenile common tern (in 2004) and an adult Arctic tern (in 2005). **Assessment of these species, in relation to the potential collision risk impact-receptor pathway, is required.**

Designated site	Summary of species recorded
	No further assessment is required of the other SCI species either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.
Tacumshin Lake SPA (4.4km) west	Whooper swan, grey plover, lapwing (*Vanellus vanellus*) and black-tailed godwit (*Limosa limosa*) have all been recorded during either the post-construction monitoring and/ or the recent breeding and winter surveys. However, none of the species were recorded in high numbers or regularly utilising the site. **No further assessment is required of the SCI species associated with Tacumshin Lake SPA either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.**
Wexford Harbour and Slobs SPA (9.7km) north west	Cormorant and black-headed gull were regularly observed during both the post-construction monitoring and the recent breeding and winter surveys. On a number of occasions more than 1% of the SPA populations was recorded. **Assessment of black-headed gull, in relation to the potential collision risk impact-receptor pathway, is required.** **No further assessment is required of the other SCI species either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.**
The Raven SPA (14.1km) north	Cormorant were regularly observed during both the post-construction monitoring and the recent breeding and winter surveys. On a number of occasions more than 1% of the SPA population was recorded. **Assessment of cormorant, in relation to the potential collision risk impact-receptor pathway, is required.** **No further assessment is required of the other SCI species either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.**
Saltee Islands SPA (14.5km) south west	Cormorant and lesser black-blacked gull were regularly observed during both the post-construction monitoring and the recent breeding and winter surveys. On a number of occasions more than 1% of the SPA population was recorded.

Designated site	Summary of species recorded
	Assessment of cormorant and lesser black-blacked gull, in relation to the potential collision risk impact-receptor pathway, is required. **No further assessment is required of the other SCI species either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.**
Ballyteige Burrow SPA (15.6km) west	Shelduck, grey plover, lapwing and black-tailed godwit have all been recorded during either the post-construction monitoring and/ or the recent breeding and winter surveys. However, none of the species were recorded regularly utilising the site in high numbers. **No further assessment is required of the SCI species associated with Ballyteige Burrows SPA either because they were not recorded during the surveys, or because they were not recorded regularly using the Proposed Development in large numbers.**

The seven species identified in Table 4-1 include sandwich tern, common tern, Arctic tern, roseate tern, cormorant, black-headed gull and lesser black-backed gull. All of these species have been regularly recorded within and adjacent to the Proposed Development site. Table 4-2 gives a summary of the 2020/21 breeding and wintering bird survey results (refer to Appendix 2), which provide the most recent data on how birds are currently utilising the site. The summary includes details of flight activity and the proportions of flights at Rotor Swept Height (RSH). The table also includes details of population trends since the start of the operation of the wind farm.

Table 4-2 Summary of breeding and wintering bird surveys

Species	Breeding (Appendix 2)	Wintering (Appendix 2)	Population trend
Sandwich tern Lady's Island Lake SPA	Sandwich terns were recorded in May, June and July mainly in the northern half of the site. Of the 19 flight lines, 84.2% of flights occurred at or partially at RSH. Sandwich terns are known to breed at Lady's Island Lake, and regularly commute across the wind farm site	N/A	Monitoring within Lady's Island Lake SPA show that there has been no significant decrease in breeding populations of sandwich tern since 2002 (Daly et al. 2011; Daly et al. 2012; Daly et al. 2016).

Species	Breeding (Appendix 2)	Wintering (Appendix 2)	Population trend
	between breeding and feeding sites.		
Common tern Lady's Island Lake SPA	Common terns were recorded in June mainly in the northern half of the site. Of the 52 flight lines, 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 and regularly commute across the wind farm site between breeding and feeding sites	N/A	Monitoring within Lady's Island Lake SPA show that there has been an increase in common terns since 2002 (Daly et al. 2011; Daly et al. 2012; Daly et al. 2016).
Arctic tern Lady's Island Lake SPA	Arctic terns were recorded in May, with two flights of an individual bird. Both flights were flying south-east in the northern boundary of the site. One of these flights occurred at RSH. Arctic terns are known to breed at Lady's Island Lake and regularly commute across the wind farm site between breeding and feeding sites.	N/A	Monitoring within Lady's Island Lake SPA show that there has been an increase in Arctic terns since 2002 (Daly et al. 2011; Daly et al. 2012; Daly et al. 2016).
Roseate tern Lady's Island Lake SPA	Two roseate tern flights of single birds were recorded in June, flying below RSH. Both flights occurred within the	N/A	Monitoring within Lady's Island Lake SPA show that there has been an increase in roseate terns since 2002 (Varty and Tanner, 2009).

Species	Breeding (Appendix 2)	Wintering (Appendix 2)	Population trend
	site boundary through the middle and northern areas of the site. Roseate terns are known to breed at Lady's Island Lake and regularly commute across the wind farm site between breeding and feeding sites.		
Cormorant Wexford Harbour and Slobs SPA Saltee Islands SPA The Raven SPA	Cormorant were observed on a regular basis across the site (with a total of 26 flight lines). Only single birds were recorded. 13.6% of cormorant flights occurred at or partially at RSH with the majority of flights below RSH. The majority of the flights took place along the southern boundary over the coast.	Cormorant were observed on a regular basis across the site. A peak of 4 birds were recorded in March. The majority of the flights were along the eastern boundary of the site over the coast. Of the 40 flight lines, 7.5% of cormorant flights occurred at or partially at RSH. The majority of flights were recorded below RSH.	IWeBS data for Wexford Harbour and Slobs SPA between 2008 and 2018 indicates that the population is stable. There is no IWeBS data for cormorant at the Saltees Island SPA or The Raven SPA; however, the general population trend for this species is increasing across Ireland (BirdLife International, accessed 2021)
Black-headed gull Lady's Island Lake SPA Wexford Harbour and Slobs SPA	Black-headed gull were recorded in every month with a peak count of 35 birds in August. 64.5% of flights were recorded on site with the remaining 35.5% adjacent to the site. 92.2% of black-headed gull flights occurred below RSH, while the remaining 7.8% occurred at or partially at RSH.	Black-headed gull were recorded in every month with a peak number of 20 birds in March. 70% of flights were recorded on site with the remaining 30% adjacent to the site. 68% of black-headed gull flights occurred below RSH, while the remaining 32% occurred at or partially at RSH.	Monitoring within Lady's Island Lake SPA show that there has been an increase in black-headed gull since 2002 (Daly et al. 2011; Daly et al. 2012; Daly et al. 2016) IWeBS data for Wexford Harbour and Slobs SPA between 2008 and 2018 indicates that the population is stable.
Lesser black-	Lesser black-backed gull were recorded in	Lesser black-backed gull were recorded in	There is no IWeBS data for lesser black-backed gull at

Species	Breeding (Appendix 2)	Wintering (Appendix 2)	Population trend
backed gull Saltee Islands SPA	May, June and July with a peak count of 2 birds in June. 20% of flights were recorded on site with the remaining 80% adjacent to the site. All lesser black-backed gull flights were below RSH.	every month with a peak number of 7 birds in December. 59% of flights were recorded on site with the remaining 41% adjacent to the site. 59% of lesser black-backed gull flights were below RSH, while the remaining 41% occurred at or partially at RSH.	the Saltees Island SPA, however, the general population trend for this species is increasing across Ireland (BirdLife International, accessed 2021)

Tern species

Whilst Arctic tern and roseate tern appeared to avoid flying through the operating wind farm (with only a small number of flight lines recorded), sandwich tern and common tern were recorded regularly commuting through the operating wind farm travelling between offshore feeding sites and breeding colonies at Lady's Island Lake SPA. Although a large proportion of the tern flight lines occurred at RSH, no collisions of terns with turbines were observed during the 2020/21 survey work and no bird carcasses were found beneath the turbines during any of the bat casualty searches undertaken in 2020 (refer to Appendix 1, Chapter 6 of the EIAR, MKO, 2021). Although terns are still choosing to fly through the Proposed Development site, the recent survey data suggests that birds have learned to avoid the air space within the wind farm area and have become habituated to the presence of the turbines, thereby reducing their likelihood of collision with the turbines.

In addition, during the current operational phase of the wind farm (2002 to 2021) monitoring within Lady's Island Lake SPA has shown that there has been no significant decrease in breeding populations of sandwich tern populations since 2002 (Daly *et al.* 2011; Daly *et al.* 2012; Daly *et al.* 2016), and increases in population of roseate terns (Varty & Tanner 2009), Arctic tern and common tern since 2002 (Daly *et al.* 2011; Daly *et al.* 2012; Daly *et al.* 2016). This provides further evidence that the presence of the wind farm during its current operational phase has not had a discernible impact on the populations of terns within the Lady's Island Lake SPA **and therefore the continued operation of the wind farm would not be considered to have an adverse effect on the integrity of the Lady's Island Lake SPA and its ability to meet its conservation objectives.**

Cormorant

Cormorant were recorded regularly during both the breeding and wintering bird surveys (refer to Appendix 2). Although cormorant are still flying through the Proposed Development site, the recent survey data suggests that birds are more likely to choose to fly to the south and east of the wind farm along the coast, thereby avoiding the potential for collision risk. In addition, of those flight lines recorded less than 14%

occurred at or partially at RSH with the majority of flights below RSH. No collisions of cormorants with turbines were observed during the 2020/21 survey work and no bird carcasses were found beneath the turbines during any of the bat casualty searches undertaken in 2020 (refer to Appendix 1, Chapter 6 of the EIAR, MKO, 2021)..

If incidental mortality due to collision with turbines was removing large numbers of individual birds, it would be expected that a corresponding decrease in breeding populations would be observed. IWeBS data for Wexford Harbour and Slobs SPA between 2008 and 2018 indicates that the population is stable and the general trend for cormorant in Ireland is that the population is increasing. Based on the continued use of the wind farm area by cormorant and the upward population trends of this species, the presence of the wind farm during its current operational phase does not appear to be having a detrimental impact on the populations of cormorant and therefore **the continued operation of the wind farm would not be considered to have an adverse effect on the integrity of the Wexford Harbour and Slobs SPA, Saltee Islands SPA or The Raven SPA and their ability to meet their conservation objectives.**

Gull Species

Although there were more black-headed gull flight lines within the Proposed Development site, compared to the coastal habitat adjacent to the wind farm during the breeding and winter season, the majority of flights were below RSH (over 60%) and therefore avoided the potential for collision. Lesser black-backed gull was recorded in smaller numbers and appeared to avoid the Proposed Development site during the breeding season, with only 20% of flights within the wind farm area, all of which were below RSH. During the winter, although there were more flight lines within the wind farm area, the majority of the flights were below RSH. Overall, the results of the recent breeding and wintering surveys seem to suggest some level of avoidance of the wind farm, with no collisions of gulls with turbines observed during the 2020/21 survey work and no bird carcasses were found beneath the turbines during any of the bat casualty searches undertaken in 2020 (refer to Appendix 1, Chapter 6 of the EIAR, MKO, 2021).

During the current operational phase of the wind farm (2002 to 2021) monitoring within Lady's Island Lake SPA has shown an increase in the population of black-headed gull since 2002 (Daly *et al.* 2011; Daly *et al.* 2012; Daly *et al.* 2016). IWeBS data for Wexford Harbour and Slobs SPA between 2008 and 2018 also indicates that the population of the SPA is fluctuating, but stable. There is no IWeBS data for lesser black-backed gull at the Saltees Island SPA; however, the general population trend for lesser black-backed gull is increasing across Ireland. Based on the most recent survey data for the Proposed Development site and the general upward population trends of both black-headed gull and lesser black-backed gull, the presence of the wind farm during its current operational phase does not appear to be having a detrimental impact on the their populations **and therefore the continued operation of the wind farm would not be considered to have an adverse effect on the integrity of the Wexford Harbour and Slobs SPA, Lady's Island Lake SPA or Saltee Islands SPA and their ability to meet their conservation objectives**.

4.5 In combination effects

The following development proposals and plan policies (listed in Table 4-3 and 4-4), along with other small residential developments, have been identified within 15km of the Proposed Development.

Table 4-3 Development proposals included in the in-combination assessment

Development	Distance from Proposed Development
Granted development at Rosslare Harbour; Wexford County Council planning ref: 20200725.	7.8km
Granted solar PV energy development at Ballykereen; Wexford County Council planning ref: 20160644.	8.3km
Granted solar PV energy developments at Ballycarran; Wexford County Council planning ref: 20160008; and, 20160009.	8km
Granted solar PV energy development at Gardmaus Great, Mayglass; Wexford County Council planning ref: 20181768.	14.1km
Granted development for a new wastewater treatment plant in Kilmore Quay to be constructed in two phases; Wexford County Council planning ref: 20191633.	15.5km
Proposed solar PV energy development at Ballycarran; Wexford County Council planning ref: 20210793.	8.6km
WCC caravan park at Castlepalister; Wexford County Council Planning Ref: 20210655.	1.7km

Table 4-5 Plans and policies included in the in-combination assessment

Plans	Information considered in the in-combination assessment
Wexford County Development Plan 2013-2019	The Wexford County Development Plan 2013-2019 sets out Wexford County Council's intentions for the future development of land, including measures for the improvement of the natural and physical environment and the provision of infrastructure. The County Council have a number of policies and objectives relating to the protection, conservation and restoration natural heritage sites including specific objectives as described below: **Objective WQ01:** To protect existing and potential water resources forthe county, in accordance with the EU Water Framework Directive (2000/60/EC), Bathing Water Directive (2006/7/ EC) the South-East River

Plans	Information considered in the in-combination assessment
	Basin Management Plan 2009-2015 and any updated version, the Pollution Reduction Programmes for designated shellfish waters, the provisions of Groundwater Protection Scheme for the county any other protection plans for water supply sources, with an aim to improving all water quality. **Objective WQ04:** To ensure that developments permitted comply with the requirements of the EU Water Framework Directive, the relevant River Basin Management Plans and the Habitats Directive. **Objective WQ05:** To ensure that development permitted would not have an unacceptable impact on water quality and quantity, including surface water, ground water, designated source protection areas, river corridors and associated wetlands, estuarine waters, coastal and transitional waters. **Objective AQ01:** To have regard to the Air Quality Standards Regulation 2011 (S.I. No. 180 of 2011) when assessing planning applications for development which may have effects on air quality. **Objective EN01:** To facilitate the achievement of a secure and efficient energy supply and storage for County Wexford. **Objective EN02:** To promote County Wexford as a low carbon county by 2019 as a means of attracting inward investment and to facilitate the development of energy sources which will achieve low carbon outputs. **Objective EN11:** To promote and facilitate wind energy development in accordance with Guidelines for Planning Authorities on Wind Energy Development (Department of Environment, Heritage and Local Government, 2006) and the Wind Energy Strategy which forms part of this Plan, subject to compliance with normal planning and environmental criteria and the development management standards contained in Chapter 18. **Objective NH01:** To conserve and protect the integrity of sites designated for their habitat/wildlife or geological/geomorphological importance and prohibit development which would damage or threaten the integrity of these sites, including SACs, cSACs.
County Wexford Biodiversity Action Plan 2013-2018	The overall aim for this Biodiversity Action Plan for County Wexford is; To protect County Wexford's Biodiversity through actions and raising awareness. The relevant key objective of the Wexford Biodiversity Action Plan includes:

Plans	Information considered in the in-combination assessment
	Objective 1 - To identify Biodiversity information and fill data gaps for the County, to prioritise habitats and species for protection and to inform conservation action and decision making.

From a review of available information online, there would be no potential impact pathways (i.e. no potential risk of collision) associated with the solar farm developments, the caravan park or other smaller residential developments which could give rise to adverse in combination effects with the Proposed Development. The re-development at Rosslare Harbour includes demolition of existing port sheds and construction of new buildings as well as associated new access roads and infrastructure. The proposed new wastewater treatment works at Kilmore Quay includes new below ground pumping stations with above ground kiosks and new connecting pipelines. None of the activities associated with either of these new developments would give rise to adverse in combination effects with the Proposed Development.

In relation to the plans and policies set out in Table 4-5, there are no polices within the Wexford County Development Plan or the Wexford Biodiversity Action Plan which would give rise to adverse in combination effects with the Proposed Development.

4.6 Appropriate Assessment Summary

Table 4-6 provides a summary of the European sites and the conclusion of the impact-receptor pathways assessed in the Appropriate Assessment.

Table 4-6 Summary of the European sites and the Appropriate Assessment conclusion

Designated site	Construction phase	Decommissioning phase	Operational phase		
			Hydrological/ hydrogeological change	Disturbance/ displacement	Collision risk
Carnsore Point SAC	There is no construction phase and therefore there are no potential impact-receptor pathways and there would be no adverse effects on the integrity of any European sites and their ability to meet their conservation objectives.	The decommissioning phase would be subject to a separate planning application and therefore does not need to be considered in this NIS.	The continued operation of the wind farm would not have any adverse effects (in relation to hydrological and hydrogeological change) on the integrity of any European sites and their ability to meet their conservation objectives.	N/A	N/A
Lady's Island Lake SAC					
Tacumshin Lake SAC					
Saltee Islands SAC					
Long Bank SAC					
Blackwater Bank SAC					

Designated site	Construction phase	Decommissioning phase	Operational phase		
			Hydrological/ hydrogeological change	Disturbance/ displacement	Collision risk
Slaney River Valley SAC					
Ballyteige Burrows SAC					
Lady's Island Lake SPA				The continued operation of the wind farm would not have any adverse effects (in relation to disturbance/ displacement due to the potential noise and physical presence of the turbine structures) on the integrity of any European sites and their ability to meet their conservation objectives.	The continued operation of the wind farm would not be considered to have an adverse effect (in relation to collision risk) on the integrity of any European sites and their ability to meet their conservation objectives.
Tacumshin Lake SPA					
Wexford Harbour and Slobs SPA					
The Raven SPA					
Saltee Islands SPA					
Ballyteige Burrow SPA					

4.7 Monitoring and mitigation

The EIS for the existing wind farm (EBS Power Generation, 1999/2000) included a three-year post-construction monitoring strategy. If significant effects were identified during these surveys, then secondary mitigation measures would be considered (such as shutting down turbine operation at key times of the year). The monitoring concluded that the operation of the wind farm had not caused any significant effects on bird species and therefore no secondary mitigation was required.

The NIS established that the extended operation of the wind farm would not have any adverse effects on the integrity of the SACs and SPAs considered in the assessment. For this reason, no additional bird monitoring or secondary mitigation is required.

5 OVERALL CONCLUSION

The NIS concludes that there would be no adverse effects on the integrity of the European sites assessed in the Appropriate Assessment as a result of the continued operation of the wind farm. It is considered that the continued operation of the wind farm would not be significantly detrimental to the fulfilment of the conservation objectives for the Lady's Island Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA and Saltees Island SPA, nor would it affect the ability of the populations of SPA species of these European sites to survive at their current conservation status.

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APPENDIX 1 – STAGE 1 AA SCREENING REPORT

ESB

Carnsore Windfarm Appropriate Assessment Screening Report

602677

RSK GENERAL NOTES

Project No.: 602677(01)

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Client: ESB

Date: 09 June 2021

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For Scott Cawley:
Ashling Cronin
28/05/2021

For RSK:
Mark Lang Associate Director MCIEEM, CEcol,CEnv

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Date:	01/06/2120	Date:	09/07/2021

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1 INTRODUCTION

1.1 This report, which contains information required for the competent authority (in this instance Wexford County Council) to undertake a screening for Appropriate Assessment (AA), has been prepared by Scott Cawley Ltd. commissioned by RSK on behalf of ESB. It provides information on, and assesses the potential for, the proposed development to impact on the Natura 2000 network (hereafter referred to as European sites)[1]. The proposed development consists of an extension of time application for the operational Carnsore Windfarm located at Carnsore Point, Co. Wexford. No infrastructural works will be required as part of the proposed development.

1.2 An AA is required if significant effects on European sites arising from a proposed development cannot be ruled out at the screening stage, either alone or in combination with other plans or projects. It is the responsibility of the competent authority to make a decision as to whether or not the proposed development is likely to have significant effects on European sites, either individually or in combination with other plans or projects.

1.3 For the reasons set out in detail in this AA Screening Report, an **Appropriate Assessment of the proposed development is required in this instance** as it cannot be concluded, on the basis of objective information, that the proposed development, either individually or in combination with other plans or projects, will not have a significant effect on the following European site(s): **Carnsore Point SAC, Lady's Island Lake SAC, Tacumshin Lake SAC, Saltee Islands SAC, Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.**

[1] The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

2 METHODOLOGY

Guidance

2.1 This Appropriate Assessment Screening Report has been prepared with regard to the following guidance documents, as relevant:

- OPR Practice Note PN01. Appropriate Assessment Screening for Development Management (Office of the Planning Regulator, 2021)
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 revision)
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2001)
- Communication from the Commission on the precautionary principle (European Commission, 2000), and
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (European Commission, 2019)

Assessment Methodology

2.2 The above referenced guidance sets out a staged process for carrying out Appropriate Assessment. To determine if an Appropriate Assessment is required, documented screening is required. Screening identifies the potential for effects on the conservation objectives of European sites, if any, which would arise from a proposed plan or project, either alone or in combination with other plans and projects (i.e. likely significant effects).

2.3 Significant effects on a European site are those that would undermine the conservation objectives supporting the favourable conservation condition of the Qualifying Interest (QI) habitats and/or the QI/Special Conservation Interest (SCI) species of a European site(s).

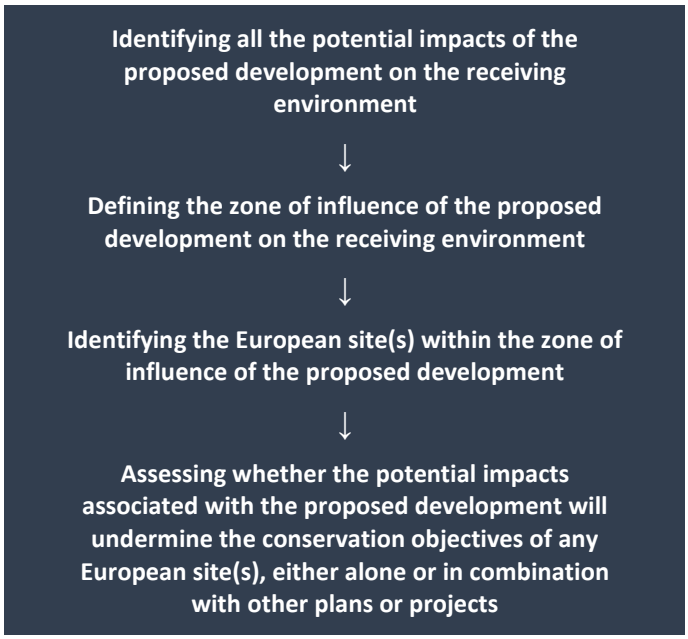
2.4 Screening for Appropriate Assessment involves the following steps:

Determining whether the proposed development is directly connected with, or necessary to the conservation management of, any European site(s)

Describing the details of the proposed development

Describing the receiving environment

Assessment of effects on European sites



2.5 If the conclusions at the end of screening are that there is no likelihood of significant effects occurring on any European sites as a result of the proposed plan or project, either alone or in combination with other plans and projects, then there is no requirement to undertake an Appropriate Assessment.

2.6 In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its QI(s) or SCI(s)[2]), and a pathway between the source and the receptor (e.g. pathway by air for airborne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

2.7 The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the Zone of Influence (ZoI) of the proposed development, and therefore potentially at risk of significant effects. The ZoI is the area over which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives[3].

[2] The term qualifying interest is used when referring to the habitats or species for which an SAC is designated; the term special conservation interest is used when referring to the bird species (or wetland habitats) for which an SPA is designated.

[3] As defined in the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018)

2.8 The identification of a source-pathway-receptor link does not automatically mean that significant effects will arise. The likelihood for significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for airborne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). Where uncertainty exists, the precautionary principle[4] is applied.

Desktop Data Review

2.9 The desktop data sources used to inform the assessment presented in this report are as follows (accessed on the 18th May 2021):

- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie[5], including conservation objectives documents
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie
- Information on the surface water network and surface water quality in the area available from www.epa.ie
- Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie
- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie
- Information on the location, nature and design of the proposed development supplied by the applicant's design team

Baseline Surveys

2.10 This section describes the ecological surveys carried out to inform the assessment of likely significant effects on European sites.

[4] The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

The guidance document *Communication from the Commission on the Precautionary Principle* (European Commission, 2000) notes that the precautionary principle "*covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection*".

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are possible and AA must be carried out.

[5] The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2019_12 and SPA_ITM_2019_12.

Habitats and Flora Survey

2.11 A habitat survey was undertaken of the proposed development site on the 21 July and 8 September 2020 by Caroline Kelly of Scott Cawley Ltd. following the methodology described in Best Practice Guidance for Habitat Survey and Mapping[6].

- All habitat types were classified using the Guide to Habitats in Ireland[7], recording the indicator species and abundance using the DAFOR scale[8] and recording any species of conservation interest.
- Vascular and bryophyte plant nomenclature generally follow that of The National Vegetation Database[9], having regard to more recent taxonomic changes to species names after the New Flora of the British Isles[10] and the British Bryological Society's Mosses and Liverworts of Britain and Ireland: A Field Guide[11].
- Annex I habitat types were classified after the Interpretation manual of European Union Habitats EUR2812 with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable.
- The nomenclature for Annex I habitats follows that of the Interpretation manual of European Union Habitats EUR28 with abbreviated names after those used in The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview[13].

Fauna Surveys

Terrestrial Mammals (excl. Bats)

2.12 A terrestrial fauna survey (excluding bats) was undertaken on the 28 and 29 April 2021 by Emmi Virkki of Scott Cawley Ltd. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected fauna species, and their potential to support these species. Surveys to check for the presence of otter holts within the proposed development site, and to record any evidence of use, were undertaken.

[6] Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

[7] Fossitt, J.A. (2000) A Guide to Habitats in Ireland. Heritage Council, Kilkenny.

[8] The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

[9] Weekes, L.C. & FitzPatrick, Ú. (2010) The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

[10] Stace, C. (2019) *New Flora of the British Isles*. *4th Edition*. C&M Floristics.

[11] Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

[12] CEC. (Commission of the European Communities) (2013) Interpretation manual of European Union Habitats EUR28. European Commission, DG Environment.

[13] NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview.* Unpublished NPWS report.

Bats

2.13 Bat surveys were carried out between July and October 2020 in accordance with Bat Conservation Trust's Bat Surveys for Professional Ecologists – Good Practice Guidelines (Collins, 2016) and Scottish Natural Heritage (SNH) guidance: *Bats and onshore wind turbines: survey, assessment and mitigation (Version: January 2019)* (SNH 2019). Full details of these surveys will be presented in the Environmental Impact Assessment Report (EIAR). In this case bats are not relevant to the Appropriate Assessment and therefore are not discussed further.

Breeding Birds

2.14 Breeding bird surveys were undertaken on the 29 April, 29 May, 5 and 17 June 2020 by Caroline Kelly and Maeve Maher-McWilliams both of Scott Cawley Ltd. Breeding bird surveys were undertaken using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species* [14]. The survey area covered the lands within the proposed development site. Lands within the proposed development site were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. 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. Target species included Special Conservation Interests (SCI) of Special Protection Areas (SPA) occurring within the vicinity of the site.

Wintering Birds

2.15 Wintering bird surveys were undertaken on the 11 November, 10 December 2019, 11 February and 3 March 2020 by Caroline Kelly and Maeve Maher-McWilliams both of Scott Cawley Ltd. Surveys were undertaken using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. The study area covered the lands within the proposed development site. A walkover route was surveyed which encompassed all habitat types within the proposed development site. All amber-listed and red-listed Birds of Conservation Concern in Ireland (BoCCI) species[15, 16]) and SCI species of SPAs occurring within the vicinity of the site were recorded during these surveys and marked on suitably scaled maps in the field. Birds were detected through direct observation and bird song and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the BTO species and activity codes.

Vantage Point Surveys

2.16 Monthly surveys were undertaken between 11 November 2019 and 29 September 2020 by Caroline Kelly and Maeve Maher-McWilliams both of Scott Cawley Ltd. Vantage point (VP) surveys were undertaken using an adapted standard methodology as described in Scottish Natural Heritage (SNH) guidance *Assessing the impact of repowered wind farms*

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

[15] Colhoun K. & Cummins, S. 2013 Birds of Conservation Concern in Ireland 2014-19. Irish Birds 9: 523-544.

[16] Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020–2026. Irish Birds 43: 1-22.

in nature (*Consultation draft)* (SNH 2018)[17], and *Recommended bird survey methods to inform impact assessment of onshore wind farms* (SNH 2017)[18], to provide data for the assessment of flight activity of target species within the site.

2.17 The VP survey area was defined as the area within the site and including a 500m buffer around the site boundary. Two VP locations within the site were identified at VP1 711772, 604442 (ITM) and VP2 711731, 604561 (ITM) to give sufficient visual coverage of the survey area.

2.18 Fifteen hours of VP observations were undertaken at each VP location during the 2019-2020 winter season, between November 2019 and March 2020, and 18 hours of VP observations were undertaken during the 2020 summer season, between April and September 2020. See Table 1 for a full list of survey dates.

2.19 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
- SCI species of SPAs 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 BoCCI species with the exception of passerines

2.20 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 secondary species rather than a target species

2.21 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.

2.22 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;

[17] Scottish Natural Heritage (SNH) (2018) *Assessing the impact of repowered wind farms in nature.* Consultation draft – June 2018

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

- 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)

2.23 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.

2.24 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).

Table 1 Vantage point survey dates

Winter 2019-2020		Summer 2020	
VP location	**Survey Date**	**VP location**	**Survey Date**
1	11/11/2019	1	29/04/2020
	11/12/2019		29/05/2020
	22/01/2020		17/06/2020
	12/02/2020		22/07/2020
	03/03/2020		28/08/2020
			29/09/2020
2	12/11/2019	2	30/04/2020
	11/12/2019		28/05/2020
	22/01/2020		05/06/2020
	11/02/2020		22/07/2020
	04/03/2020		28/08/2020
			15/09/2020

3 PROVISION OF INFORMATION FOR SCREENING FOR APPROPRIATE ASSESSMENT

3.1 The following sections provide information to facilitate the Appropriate Assessment screening of the proposed development to be undertaken by the competent authority.

3.2 A description of the proposed development and the receiving environment is provided to identify the potential ecological impacts. The environmental baseline conditions are discussed, as relevant to the assessment of ecological impacts where they may highlight potential pathways for impacts associated with the proposed development to affect the receiving ecological environment (e.g. geological, hydrogeological and hydrological data).

3.3 The potential impacts are examined in order to define the potential zone of influence of the proposed development on the receiving environment. This then informs the assessment of whether the proposed development will result in significant effects on any European sites; i.e. affect the conservation objectives supporting the favourable conservation condition of the European site's QIs or SCIs.

Description of the Proposed Development

3.4 The proposed development includes an extension of time application for the existing and fully operational Carnsore Windfarm located at Carnsore Point, Co. Wexford. There are no alterations to the existing and operational windfarm as part of the extension of time application.

Overview of the Receiving Environment

European sites

3.5 There is overlap with the site boundary and Lady's Island Lake SAC, an area of *c.* 1.915ha of the SAC overlaps with the south-western corner of the site. The site directly abuts Carnsore Point SAC along stretches of the north-eastern boundary of the site and is also directly adjacent to the SAC boundary for most of the eastern side of the site. Other European sites in close proximity to the site are Lady's Island Lake SPA located *c.* 136m north east of the site, at its nearest point, Tacumshin Lake SAC *c.* 3.8km and Tacumshin Lake SPA *c.* 4.4km both west of the site boundary. All of the European sites present in the vicinity of the proposed development are shown on Figures 1, 2, 3 and 4 below. The QIs/SCIs of the European sites in the vicinity of the proposed development are provided in Appendix I.

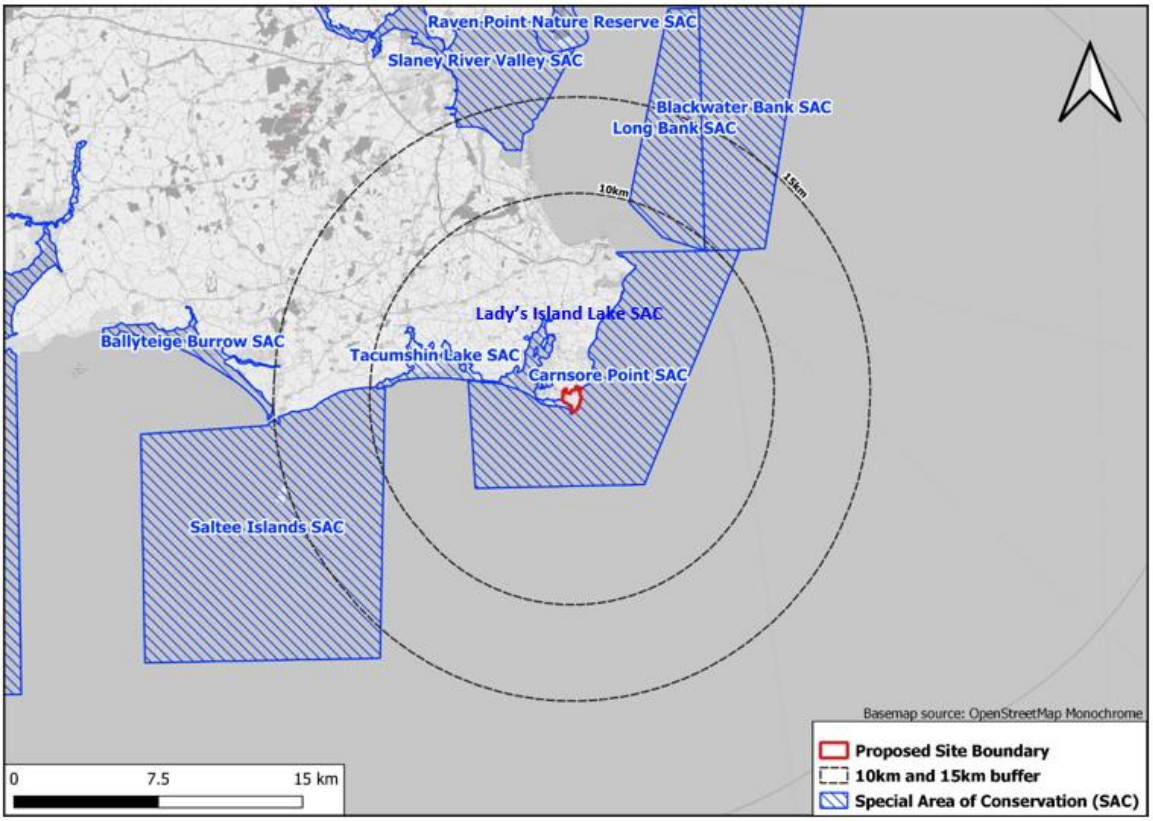


Figure 1 Special Areas of Conservation in the vicinity of the proposed development

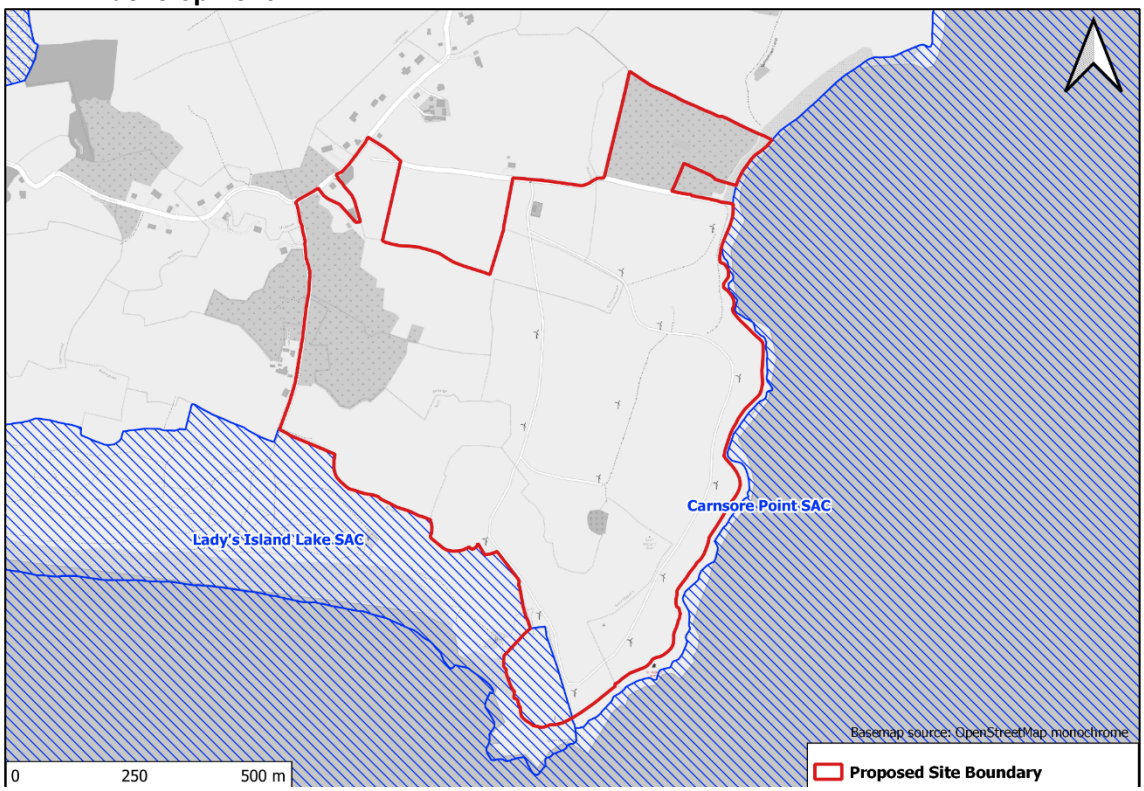


Figure 2 The proposed development boundary in relation to Lady's Island Lake SAC and Carnsore Point SAC

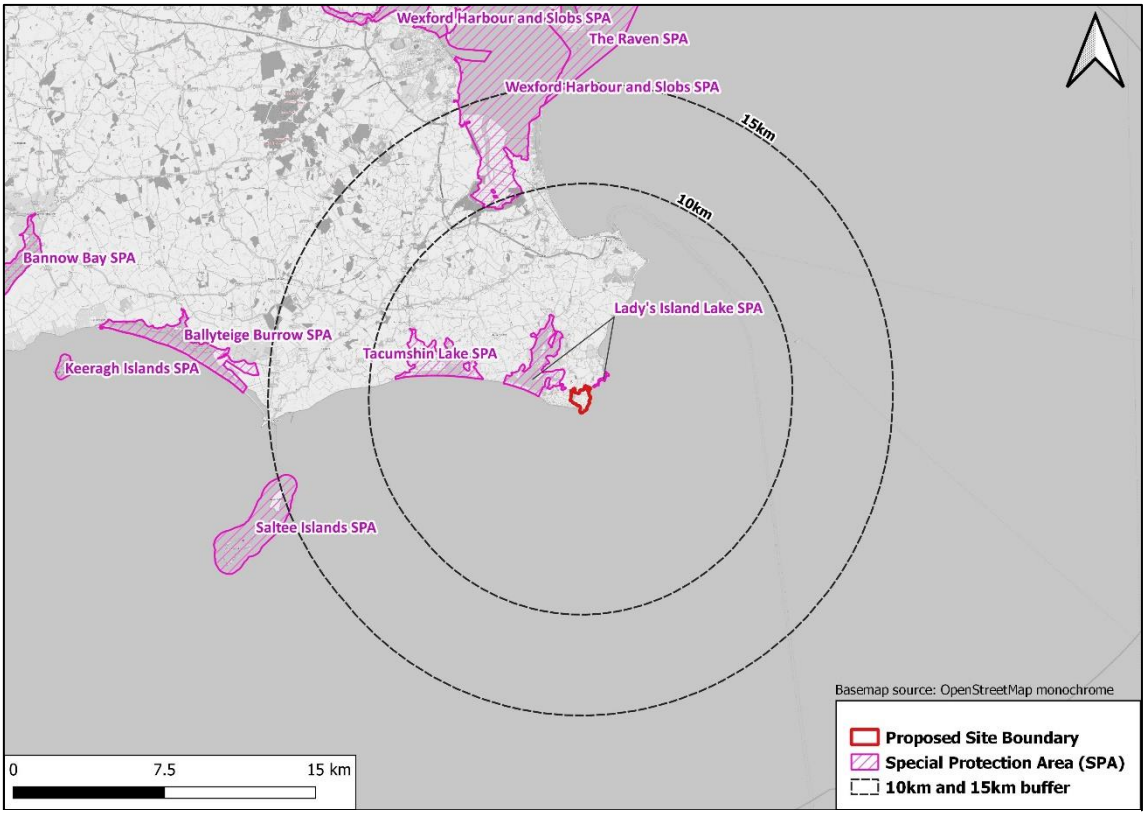


Figure 3 SPAs in the vicinity of the Proposed Development

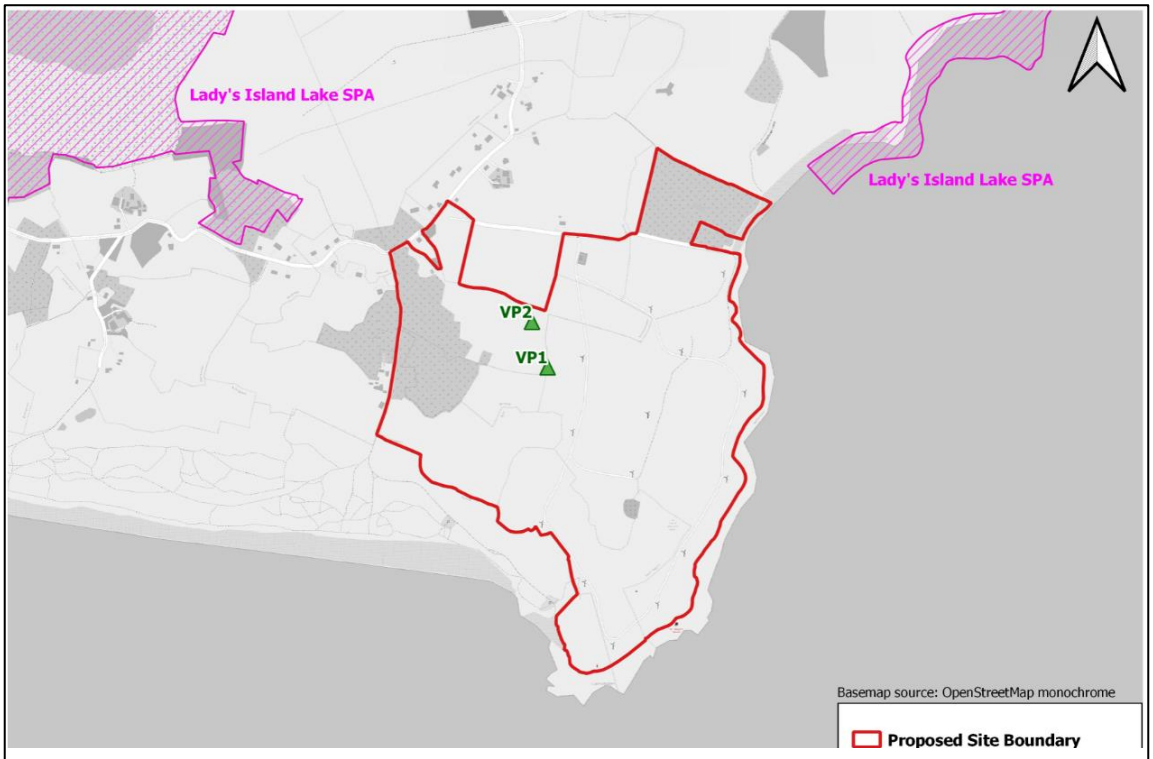


Figure 4 The proposed site boundary in relation to Lady's Island Lake SPA

Habitats

3.6 The following habitat types, and mosaics of same, as described in Fossitt (2000) were identified within the site boundary:

- Arable crops (BC1);
- Stonewalls and other stonework (BL1);
- Earth banks (BL2);
- Buildings and artificial surfaces (BL3);
- Rocky sea cliffs (CS1);
- Spoil and bare ground (ED2);
- Recolonising bare ground (ED3);
- Reed and large sedge swamps (FS1);
- Improved agricultural grassland (GA1);
- Dry calcareous and neutral grassland (GS1);
- Dry meadows and grassy verges (GS2);
- Wet grassland (GS4);
- Dense bracken (HD1);
- Shingle and gravel shores (LS1);
- Moderately exposed rocky shores (LR2);
- Mixed substrata shores (LR4);
- Hedgerow (WL1); and;
- Scrub (WS1).

Flora and Fauna Species

3.7 The National Biodiversity Data Centre (NBDC) database search returned no records of any Annex II plant species recorded within 2km of the proposed development site. No Annex II plant species and no records of plant species protected through their inclusion within the Flora (Protection) Order, 2015 were recorded during the habitat field surveys in 2020. The following non-native invasive plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended were recorded from the desktop search within 2km the site:

- Three-cornered garlic *Allium triquetrum*
- Japanese knotweed *Fallopia japonica*
- Sea-buckthorn *Hippophae rhamnoides*

3.8 Habitat surveys at the site recorded a localised stand of Montbretia *Crocosmia x crocosmiiflora* in the northern section of the site in reed and large sedge swamp habitat. No other non-native invasive species were recorded.

3.9 The NBDC database search returned the following records of qualifying interest (QI) and special conservation interest (SCI) species within 2km of the site, for which European sites have been designated and that occur in the vicinity of the site:

- Otter (*Lutra lutra)*

- Grey Seal (*Halichoerus grypus)*
- Common Tern (*Sterna hirundo)*
- Arctic Tern (*Sterna paradisaea)*
- Roseate Tern (*Sterna dougallii*)
- Sandwich Tern (*Sterna sandvicensis*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Bewick's Swan (*Cygnus columbianus subsp. bewickii*)
- Whooper Swan (*Cygnus cygnus*)
- Greenland White-fronted Goose (*Anser albifrons*)
- Coot (*Fulica atra*)
- Goldeneye (*Bucephala clangula*)
- Teal (*Anas crecca*)
- Wigeon (*Anas penelope*)
- Gadwall (*Anas strepera*)
- Scaup (*Aythya marila*)
- Mallard (*Anas platyrhynchos*)
- Pintail (*Anas acuta*)
- Shoveler (*Anas clypeata*)
- Common Scoter (*Melanitta nigra*)
- Curlew (*Numenius arquata*)
- Golden Plover (*Pluvialis apricaria*)
- Lapwing (*Vanellus vanellus*)
- Hen Harrier (*Circus cyaneus*)
- Red-breasted Merganser (*Mergus serrator*)
- Red-throated Diver (*Gavia stellata*)

3.10 The NBDC database returned a record for otter to the northeast of the site along the shoreline, however no sightings, signs or holts of otter were recorded during the mammal survey undertaken at the site.

3.11 Of the SCI birds listed above and those SCI species that are associated with European sites that occur in the vicinity of the proposed development, as shown on Figure 2 and detailed in Appendix I, 14 species were recorded during breeding bird surveys and/or winter bird surveys at the site. The following SCI species were recorded during winter bird surveys undertaken at the site and were typically recorded foraging or commuting along the coastline adjacent to the site, or agricultural fields north and west of the site, rather than traversing the area where the operational turbines are located:

- Cormorant (*Phalacrocorax carbo)*
- Gannet (*Morus bassanus)*
- Black-headed Gull (*Chroicocephalus ridibundus)*
- Lesser Black-backed Gull (*Larus fuscus*)
- Herring Gull (*Larus argentatus*)

- Grey Heron (*Ardea cinerea)*
- Whooper Swan
- Curlew
- Redshank (*Tringa tetanus)*

3.12 In addition to the species recorded during winter surveys, the following species were recorded during summer bird surveys, and were often recorded traversing through the area where the operational turbines are located, or over agricultural fields north and west of the site:

- Grey Plover (*Pluvialis squatarola)*
- Sandwich Tern
- Common Tern
- Arctic Tern
- Roseate Tern

3.13 Based on an analysis of desktop and survey data collected, the site does not represent a breeding location for SCI species nor does it represent an important feeding ground for SCI species, however it is regularly traversed by a number of the aforementioned SCI species namely sandwich tern and common tern.

Hydrology

3.14 The site is located within the Ballyteigue-Bannow catchment and the Kisha_SC_010 sub-catchment. There are no surface water features within the proposed development site. The site is surrounded by the Eastern Celtic Sea waterbody, and Lady's Island Lake is c. 1.4km west where it outflows into the sea. These waterbodies the nearest hydrological features to the site. The Eastern Celtic Sea has a coastal waterbody Water Framework Directive (WFD) status of '*Unassigned*' according to the EPA and is '*Not at Risk'* of not achieving good status under the WFD[19]. Lady's Island Lake has a WFD status of '*Bad*' and is '*At Risk'* of not achieving good status under the WFD[20].

3.15 Given the sites proximity to the Eastern Celtic Sea waterbody and that the site is surrounded by it to the east and south, the Eastern Celtic Sea waterbody is assumed to be the receiving waterbody of any surface waters from the proposed development site.

Hydrogeology

3.16 Geological Survey of Ireland (GSI) data indicates that the bedrock underlying the site is 'Carnsore Granite' and the groundwater bedrock gravel aquifer is 'Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones'. The Groundwater Body (GWB) underlying the site is named 'Bridgetown' (Code IE_SE_G_022), which is currently classified by the EPA as having '*Good*' groundwater status and '*Not at risk*' of not achieving good status under the WFD. The groundwater vulnerability occurring within the

[19] EPA (2018) Waterbody: Eastern Celtic Sea Accessed 19.05.2021 at [https://www.catchments.ie/data/#/waterbody/IE_SE_050_0000?_k=9ibnpp]

[20] EPA (2018) Waterbody: Lady's Island Lake. Accessed 19.05.2021 at [https://www.catchments.ie/data/#/waterbody/IE_SE_060_0100?_k=60q7pl]

site is ‘High’. Due to the site’s coastal nature, it is assumed that the groundwater on site is influenced by the tidal cycle.

Assessment of Effects on European Sites

3.17 This section identifies all the potential impacts associated with the proposed development, examines whether there are any European sites within the ZoI of effects from the proposed development, and assesses whether there is any risk of the proposed development resulting in a significant effect on any European site, either alone or in combination with other plans or projects.

3.18 In assessing the potential for the proposed development to result in a significant effect on any European sites, any measures intended to avoid or reduce the harmful effects of the project on European sites cannot and have not been taken into account.

Habitat loss and fragmentation

3.19 The site boundary overlaps with the boundary of a European site, Lady’s Island Lake SAC, and is adjacent to the boundary of a second European site, Carnsore Point SAC, see Figure 2.

3.20 Lady’s Island Lake SAC was proposed as a European site in December 1999[21]. Given the overlap between the site’s boundary and Lady’s Island Lake SAC boundary, there is potential for the QI habitat Perennial vegetation of stony banks [1220] to occur within the original development boundary . From studying orthophotographs dating 1995[22] and 2005-2012[23], and reviewing the Environmental Impact Statement (EIS) that was submitted for the original planning application for Carnsore Windfarm[24], it does not appear that there was any overlap of the operational windfarm footprint, including turbine bases, and access roads, and any QI habitat of Lady’s Island Lake SAC. No QI habitat, therefore, has been lost as a result of Carnsore Windfarm which is the subject of the proposed extension of life application. It can therefore be concluded that the proposal, which will not alter any of the existing infrastructure of the Carnsore Windfarm, will not result in the direct loss or fragmentation of QI habitats associated with any European site.

Habitat degradation as a result of hydrological and hydrogeological impacts

3.21 The proposed extension of life application will not involve any earthworks or alter any of the existing infrastructure of the Carnsore Windfarm and therefore will not result in the generation of construction phase surface water run-off. However, an accidental pollution event (e.g. hydrocarbon spills during maintenance) during the extension of operation of

[21] Lady’s Island Lake SAC [IE0000704] Natura 2000 – Standard data form. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht. Accessed 28.05.2021 at [https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000704.pdf]

[22] 1995 Series black & white OSi 1m per pixel orthophotography. ITM projection, cached from 1:4,000,000 to 1:1000. Watermarked with OSi logo. Accessed 28.05.2021 at [http://map.geohive.ie/]

[23] OSi 1m per pixel orthophotography. Ortho capture date ranges from 2005 to 2012. ITM projection, cached from 1:4,000,000 to 1:1000. Watermarked with OSi logo. Accessed 28.05.2021 at [http://map.geohive.ie/]

[24] Carnsore Point Windfarm Environmental Impact Statement. (1999/2000) ESB International.

Carnsore Windfarm, has the potential to affect the surface water or groundwater quality, and therefore, impact water quality in the adjacent marine environment.

3.22 A pollution event, of a sufficient magnitude during operation, has the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that could undermine the conservation objectives of the Carnsore Point SAC, Lady's Island Lake SAC, Tacumshin Lake SAC, Saltee Islands SAC, Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.

Species mortality as a result of hydrological and hydrogeological impacts

3.23 Internationally important numbers of wintering birds and pre-migrating terns use intertidal, estuarine and marine habitats for feeding and roosting. These species would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting. Birds are mobile species and can travel between designated sites. Some wintering SCI species occurring in the area of the site could be associated with SPAs up to 20km from the proposed development site.[25] European sites potentially at risk are Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.

3.24 Other mobile fauna such as marine mammals, for example Grey seal, could also be at risk of hydrological and hydrogeological impacts if a pollution event of a sufficient magnitude was to occur during operation at an extent that undermines the conservation objectives of Saltee Islands SAC and Slaney River Valley SAC.

Habitat degradation as a result of introducing/spreading non-native invasive species

3.25 The proposed extension of life application will not involve any earthworks which could potentially result in the spread of non-native invasive species which occur within site. Given the overlap of the site boundary and Lady's Island Lake SAC and the adjacent Carnsore Point SAC, there is a risk that operational duties of the windfarm could potentially result in the introduction of non-native invasive species to these European sites. However, a localised stand of Montbretia *Crocosmia x crocosmiiflora* was the only non-native invasive plant species recorded and it was recorded in the northern section of the site in reed and large sedge swamp habitat, away from any windfarm infrastructure. There remains the remote potential for the operation of the windfarm to potentially result in the introduction of non-native invasive species (for example from mud attached to maintenance vehicles) to Lady's Island Lake SAC and Carnsore Point SAC undermining the conservation objectives of the European sites.

Disturbance and displacement impacts

3.26 Operational disturbance and displacement of fauna species could potentially occur within the vicinity of the site. For mammal species such as otter, disturbance effects would not

[25] Scottish Natural Heritage (2016) Guidance: Assessing connectivity with Special Protection Areas (SPAs). Version 3

be expected to extend beyond 150m[26]. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general operational activities would attenuate to close to background levels at that distance. [27]

3.27 In relation to the proposal, operational noise disturbance is unlikely to extend to a distance that could affect mammal species or birds, however disturbance and displacement from the physical presence of operational turbines, and presence of operational maintenance staff could impact SCIs and their behaviour to an extent that could undermine the conservation objectives of Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.

Bird mortality as a result of Collision Risk Impacts

3.28 A number of SCI species were recorded during winter and summer bird surveys at the site, either traversing the area around the turbines or commuting through the site. Considering the sites coastal location and known bird collision risk associated with turbines there is potential for the operational turbines to present a collision risk to mobile SCI species which may traverse the site.

3.29 Birds are mobile species and can travel up to 20km from designated sites.[28] As such collision risk impacts resulting in bird mortality occurring at a sufficient magnitude, has the potential to affect birds that occur in the receiving environment (either alone or in combination with other disturbance and displacement pressures) to an extent that undermines the conservation objectives of Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.

Summary

3.30 The potential impacts associated with the proposed development have the potential to affect the receiving environment and, consequently, have the potential to affect the conservation objectives supporting the qualifying interest/special conservation interests of a European site(s). Therefore, the proposed development could potentially have significant effects on a European site(s).

3.31 As the proposed development itself is likely to affect the QIs/SCIs or conservation objectives of a European site(s), there is also the potential for other plans or projects to act in combination with it to result in likely significant effects on European sites.

[26] This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

[27] The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. *Wildfowl* (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

[28] Scottish Natural Heritage (2016) Guidance: Assessing connectivity with Special Protection Areas (SPAs). Version 3

3.32 The potential impacts of the proposed development on the receiving environment, their ZoI, and the European sites at risk of likely significant effects are summarised in Table 2 below. In assessing the potential for the proposed development to result in a significant effect on any European sites, any measures intended to avoid or reduce the harmful effects of the project on European sites are not taken into account.

Table 2 Summary of Analysis of Likely Significant Effects on European sites

Potential Direct, Indirect In Combination Effects and the ZoI of the Potential Effects	Are there any European sites within the ZoI of the proposed development?
Habitat loss There will be no habitat loss associated with the proposed development.	No The proposal will not alter the existing windfarm infrastructure and will not result in any habitat loss.
Habitat degradation as a result of hydrological and hydrogeological impacts Habitats occurring below the high tide line and downstream of the proposed development site, connected via surface waters and groundwater, are potentially at risk from spillages impacts arising from the continued operational windfarm.	Yes There are European sites at risk of hydrological and hydrogeological effects associated with the proposed development which are; Carnsore Point SAC, Lady's Island Lake SAC, Tacumshin Lake SAC, Saltee Islands SAC, Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.
Species mortality as a result of hydrological and hydrogeological impacts Species occurring in habitats below the high tide line and downstream of the proposed development site are at risk to species mortality from at risk from spillages impacts arising from the continued operational windfarm these include mobile fauna species such as birds and marine mammals.	Yes There are European sites at risk of hydrological and hydrogeological effects associated with the proposed development which are; Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.
Habitat degradation as a result of introducing/spreading non-native invasive species Habitat areas within, adjacent to, and potentially downstream of the proposed development site.	Yes There are non-native invasive species present on the proposed development site and, therefore, a risk associated with the proposed development to any European sites from the spread/introduction of non-native invasive species. These sites include; Carnsore Point SAC and Lady's Island Lake SAC.

Potential Direct, Indirect In Combination Effects and the ZoI of the Potential Effects	Are there any European sites within the ZoI of the proposed development?
Disturbance and displacement impacts Disturbance impacts associated with the operation of the proposed development and displacement impacts associated with the physical presence of the operational development.	Yes There are European sites within the potential zone of influence of disturbance and displacement effects associated with the operation of the proposed development and include; Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA
Bird mortality as a result of collision risk impact Potential for mortality of mobile SCI species as result of collision with tall structures and rotating blades during operation.	Yes There are European sites within the potential zone of influence of collision risk impact and include; Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.

4 CONCLUSIONS OF SCREENING ASSESSMENT PROCESS

4.1 Following an examination, analysis and evaluation of the best available information, and applying the precautionary principle, it can be concluded that there is the possibility for significant effects on the following European sites, either arising from the project alone or in combination with other plans and projects, as a result of habitat degradation and species mortality arising from hydrological and hydrogeological impacts, habitat degradation as a result of introducing/spreading non-native invasive species, disturbance and displacement impacts, and, bird mortality as a result of collision risk impact: **Carnsore Point SAC, Lady's Island Lake SAC, Tacumshin Lake SAC, Saltee Islands SAC, Lady's Island Lake SPA, Tacumshin Lake SPA, Wexford Harbour and Slobs SPA, The Raven SPA, Saltee Islands SPA and Ballyteige Burrow SPA.**

4.2 In reaching this conclusion, the nature of the project and its potential relationship with all European sites within the zone of influence, and their conservation objectives, have been fully considered.

4.3 Therefore, it is the professional opinion of the authors of this report that the application for consent for the proposed development does require an Appropriate Assessment and the preparation of a Natura Impact Statement (NIS).

APPENDIX 1

The Qualifying Interests (QIs) and Special Conservation Interests (SCIs) of the European sites in the vicinity of the proposed development site (see Figure 1 and Figure 3)

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Special Area of Conservation (SAC)	
Carnsore Point SAC Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] NPWS (2011) *Conservation Objectives: Carnsore Point SAC 002269. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	The proposed development lies immediately adjacent to the European site boundary
Lady's Island Lake SAC Coastal lagoons [1150] Reefs [1170] Perennial vegetation of stony banks [1220] NPWS (2019) *Conservation Objectives: Lady's Island Lake SAC 000704. Version 1.* National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	The proposed development lies within the European site boundary
Tacumshin Lake SAC Coastal lagoons [1150] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] NPWS (2018) *Conservation Objectives: Tacumshin Lake SAC 000709. Version 1.* National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	*c.* 3.8km west
Saltee Islands SAC Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Submerged or partially submerged sea caves [8330] *Halichoerus grypus* (Grey Seal) [1364] NPWS (2011) *Conservation Objectives: Saltee Islands SAC 000707 and Saltee Islands SPA 004002. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 9.2km west

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Long Bank SAC Sandbanks which are slightly covered by sea water all the time [1110] NPWS (2013) *Conservation Objectives: Long Bank SAC 002161. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 9.6km north
Blackwater Bank SAC Sandbanks which are slightly covered by sea water all the time [1110] NPWS (2013) *Conservation Objectives: Blackwater Bank SAC 002953. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 9.6km north
Slaney River Valley SAC Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Alosa fallax fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] NPWS (2011) *Conservation Objectives: Slaney River Valley SAC 000781. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 12.5km northwest
Ballyteige Burrow SAC Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Spartina swards (*Spartinion maritimae*) [1320] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	c. 14.7km west

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) [1420] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150] Humid dune slacks [2190] NPWS (2014) *Conservation Objectives: Ballyteige Burrow SAC 000696. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	
Special Protection Area (SPA)	
Lady's Island Lake SPA [004009] 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] NPWS (2021) *Conservation objectives for Lady's Island Lake SPA [004009]*. Generic Version 8.0. Department of Housing, Local Government and Heritage.	*c.* 300m northwest
Tacumshin Lake SPA (004092) 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] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Wetland and Waterbirds [A999]	*c.* 4.4km west

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
NPWS (2021) *Conservation objectives for Tacumshin Lake SPA [004092]*. Generic Version 8.0. Department of Housing, Local Government and Heritage.	
Wexford Harbour and Slobs SPA (004076) 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] 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] NPWS (2012) *Conservation Objectives: Wexford Harbour and Slobs SPA 004076. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 9.7km northwest

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
The Raven SPA (004019) 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] NPWS (2012) *Conservation Objectives: The Raven SPA 004019.* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht	*c.* 14.1km north
Saltee Islands SPA (004002) 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] NPWS (2011) *Conservation Objectives: Saltee Islands SAC 000707 and Saltee Islands SPA 004002.* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 14.5km southwest
Ballyteige Burrow SPA (004020) Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Golden Plover (*Pluvialis apricaria*) [A140] 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] NPWS (2014) *Conservation Objectives: Ballyteige Burrow SPA 004020. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	*c.* 15.6km west

APPENDIX 2 – BREEDING AND WINTERING BIRD SURVEY REPORTS (2020/2021)

ESB

Carnsore Windfarm Summer Bird Report 2020

602677 (01)

MARCH 2021

RSK GENERAL NOTES

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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

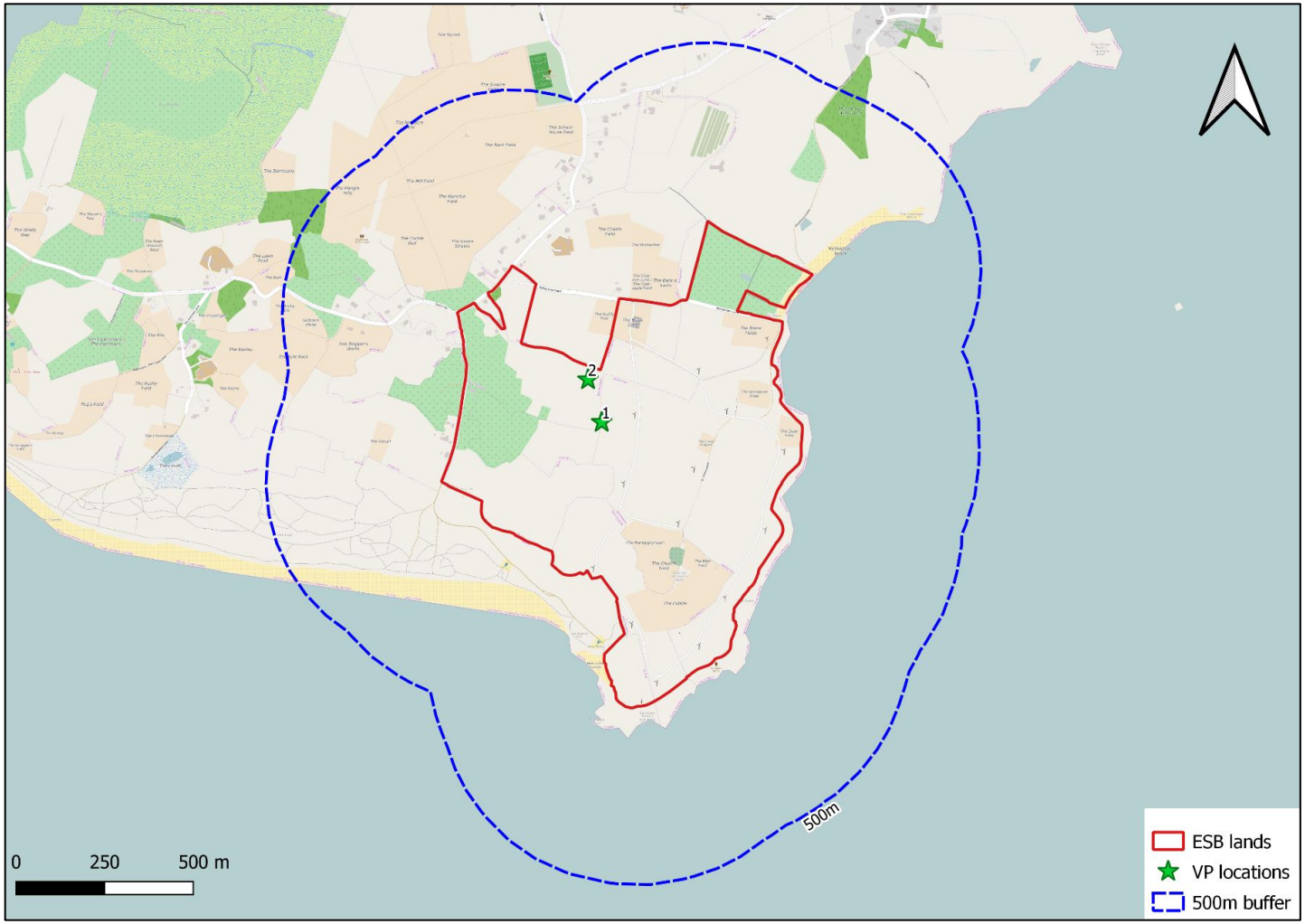

Figure 1: Ornithological Survey Area

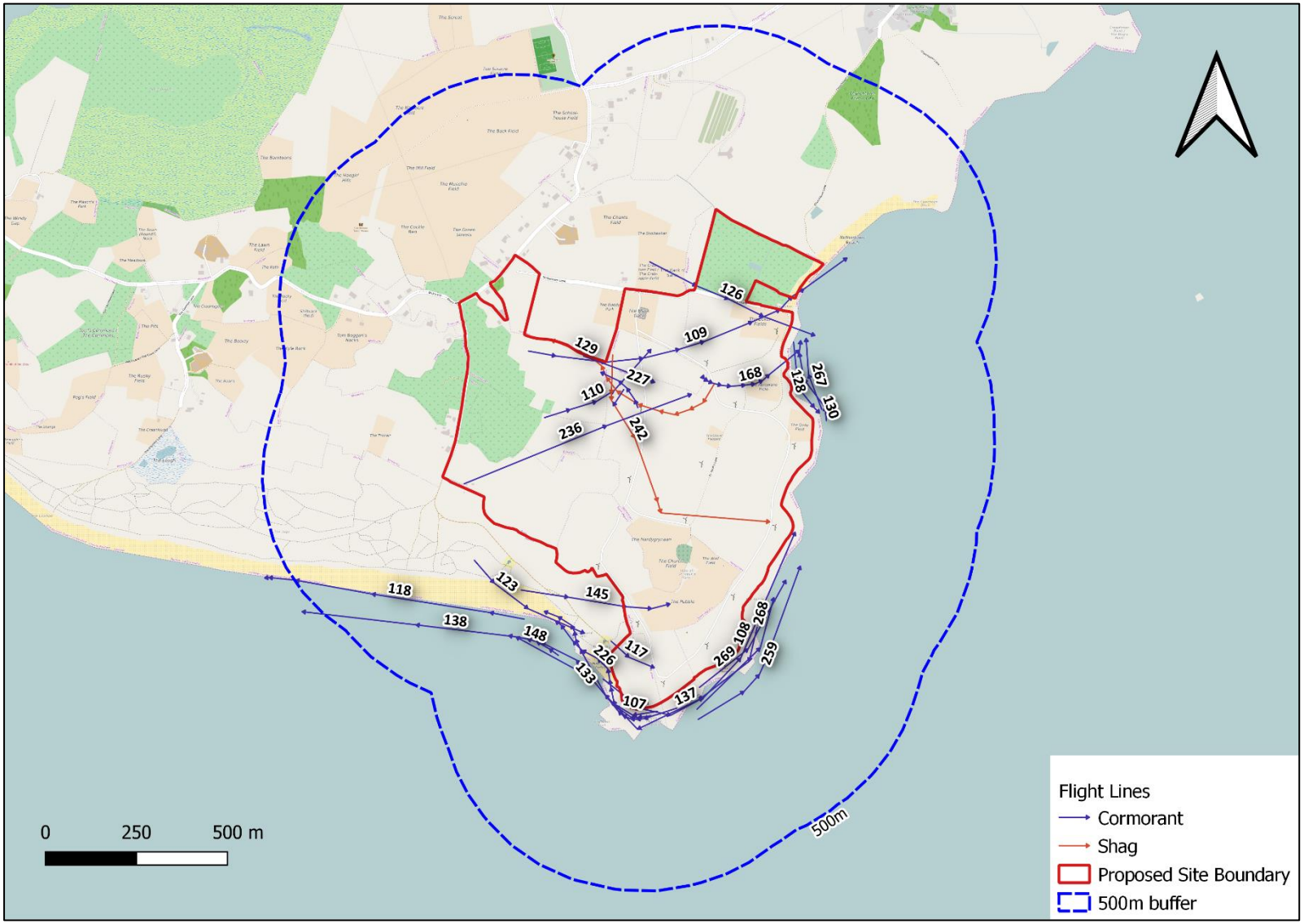

Figure 2: Cormorant and Shag Flight Lines

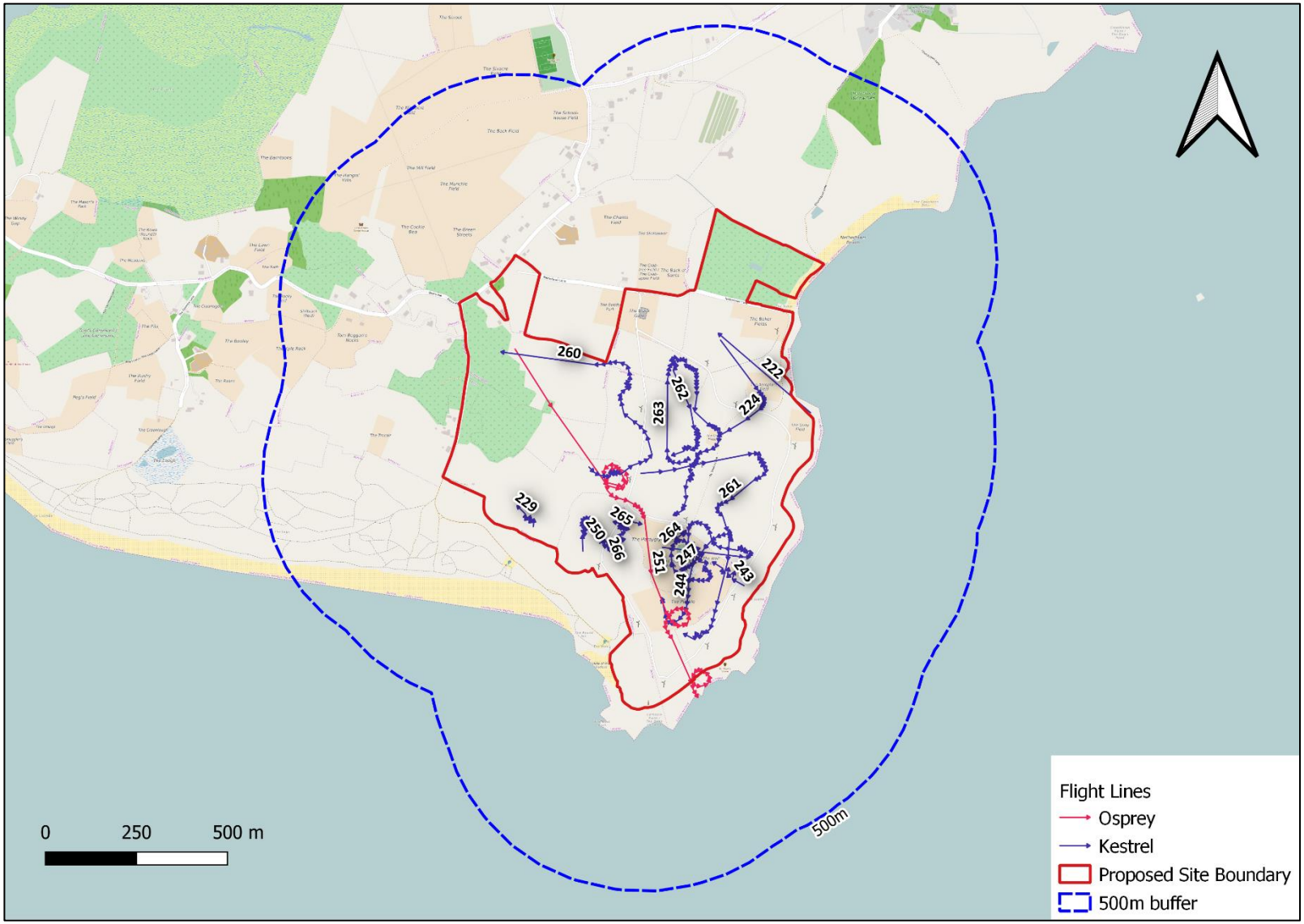

Figure 3: Kestrel and Osprey Flight Lines

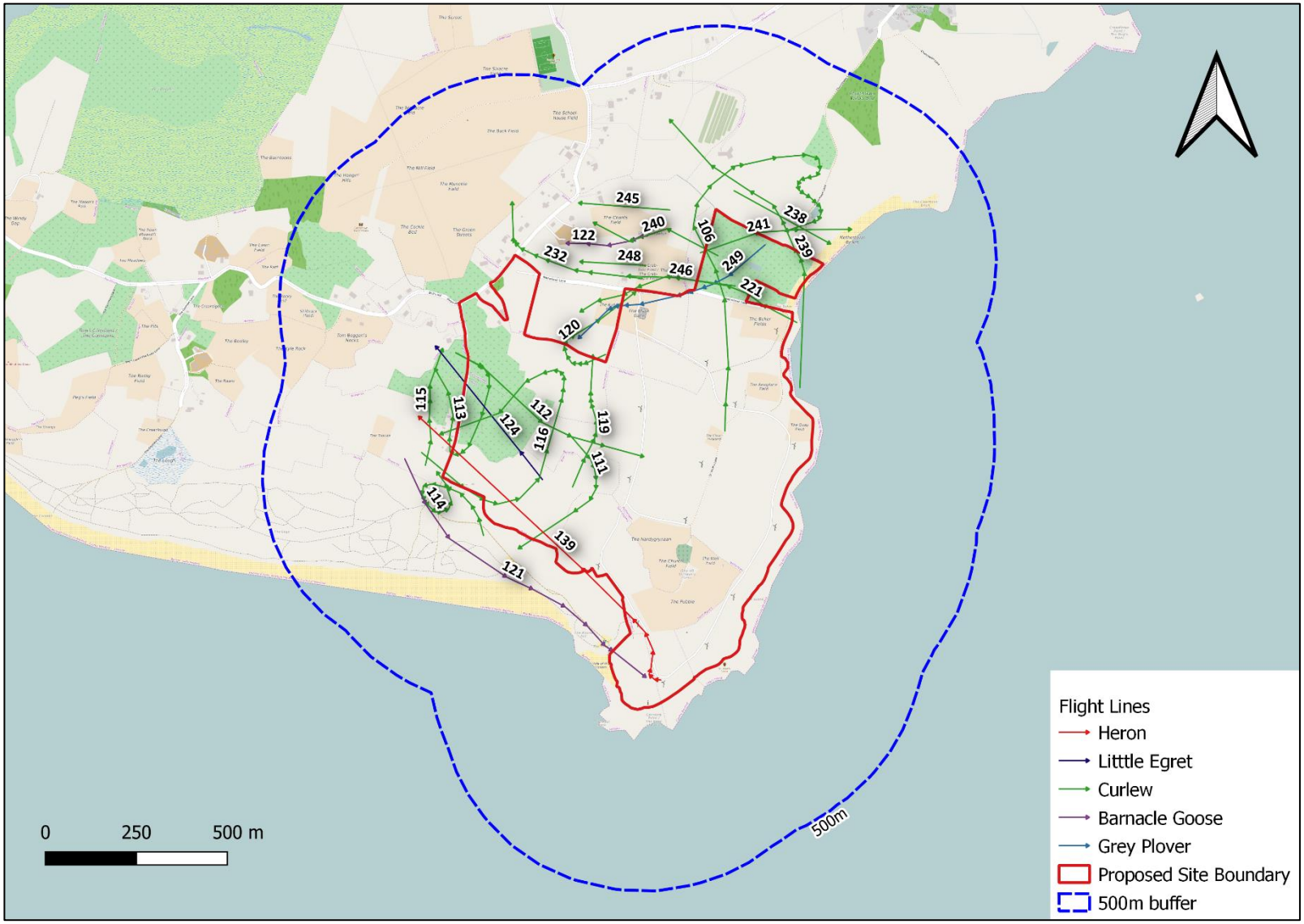

Figure 4: Heron, Little Egret, Curlew, Barnacle Goose and Grey Plover Flight Lines

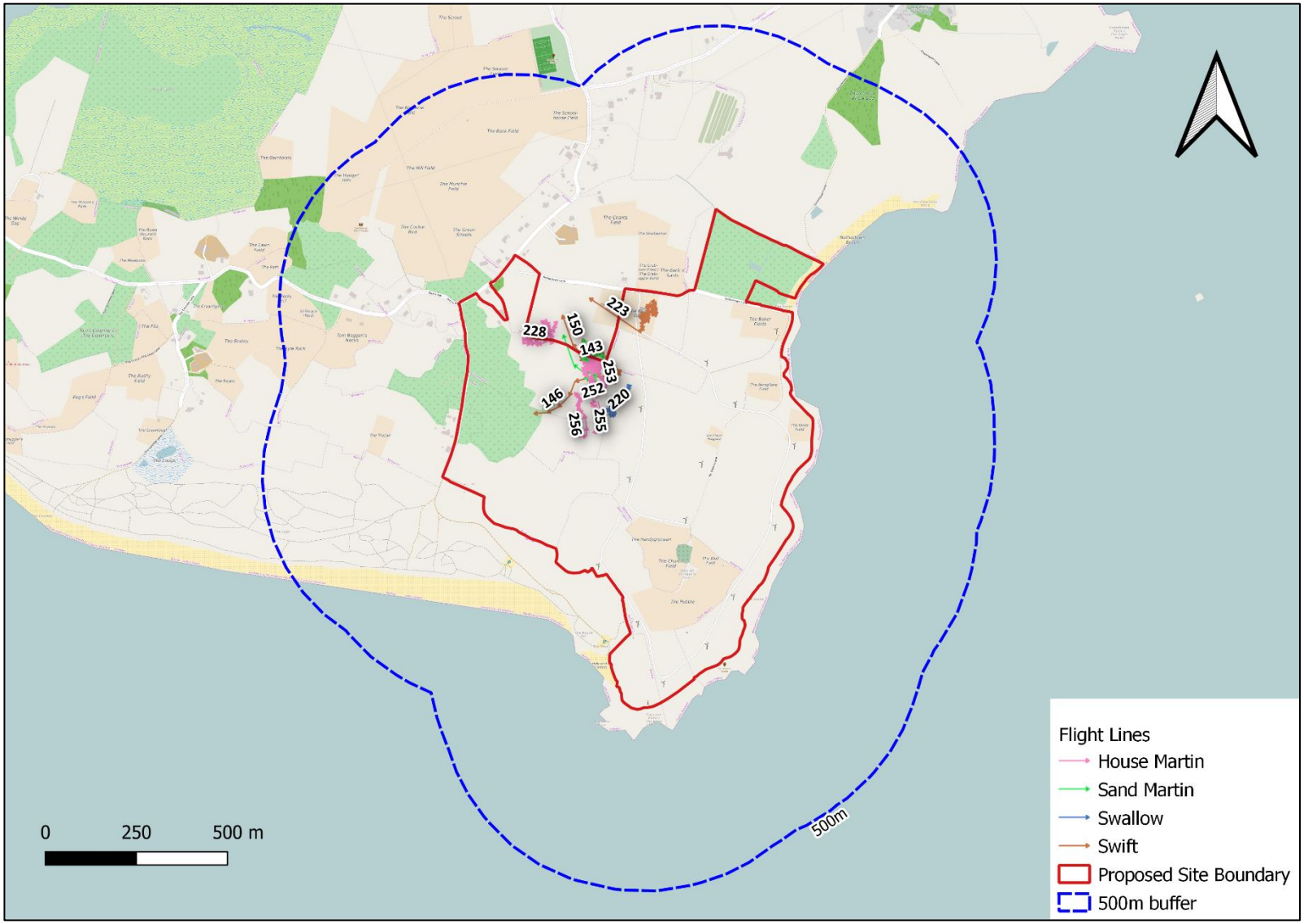

Figure 5: Swift, Sand Martin, House Martin and Swallow Flight Lines

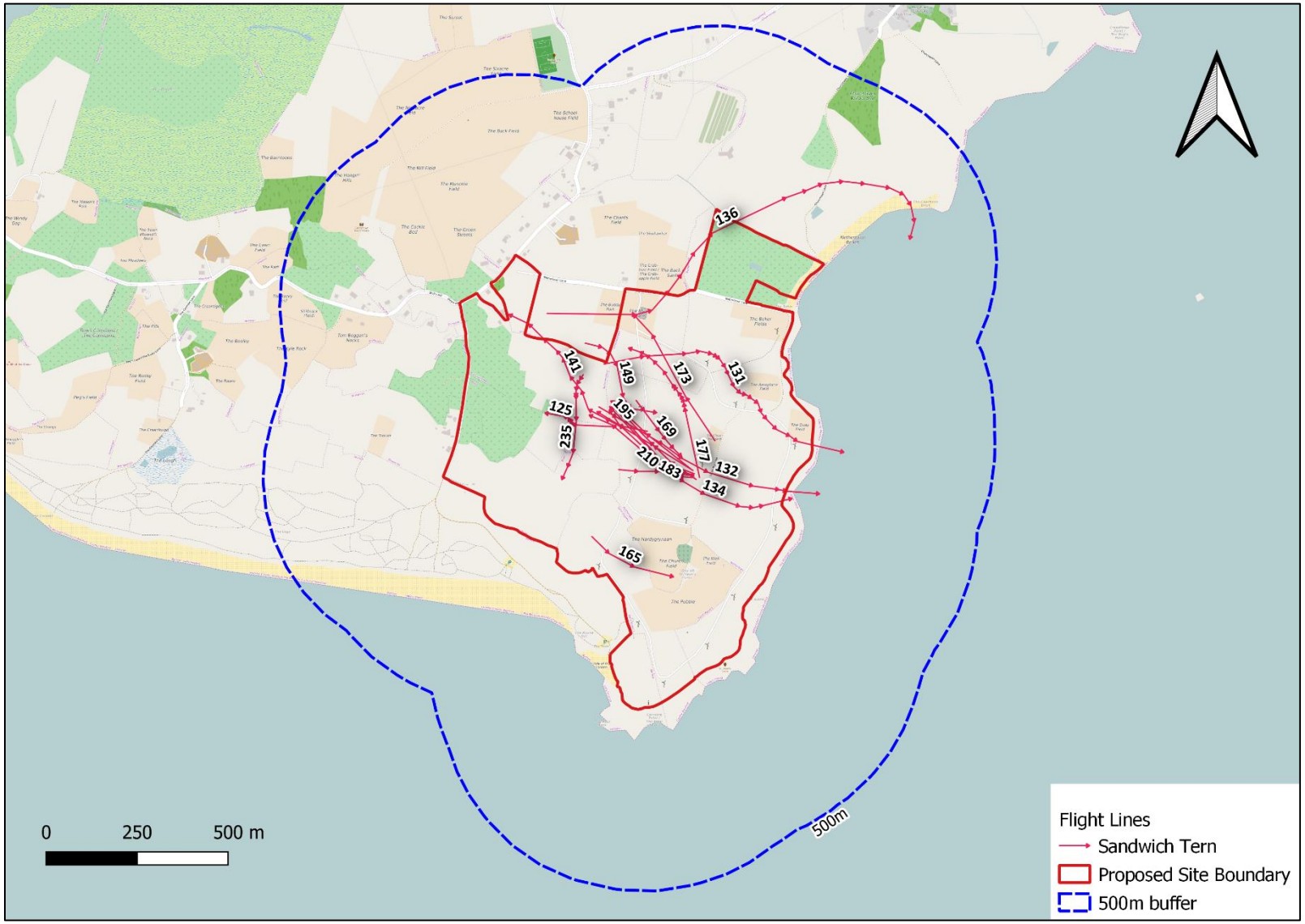

Figure 6: Sandwich Tern Flight Lines

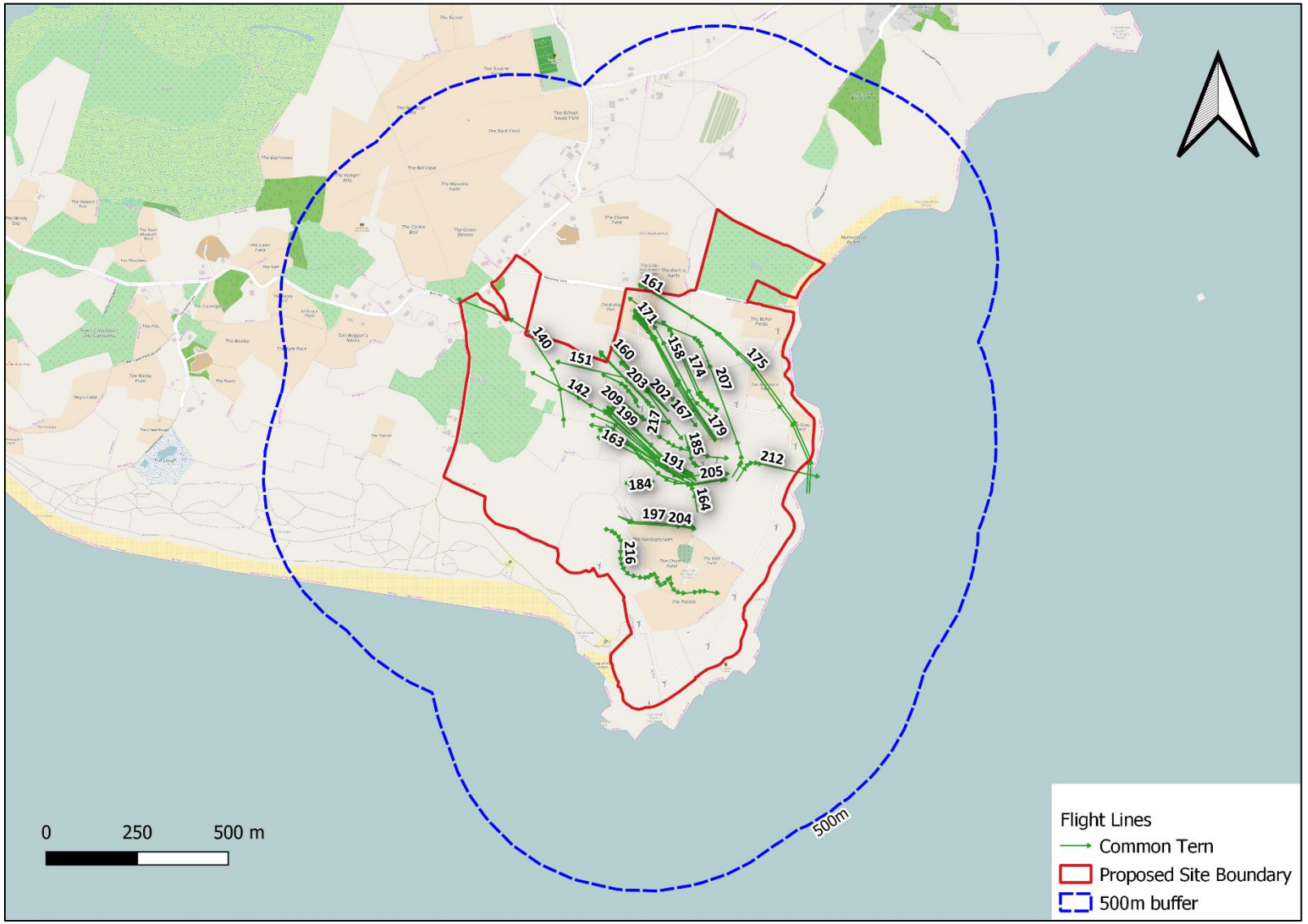

Figure 7: Common Tern Flight Lines

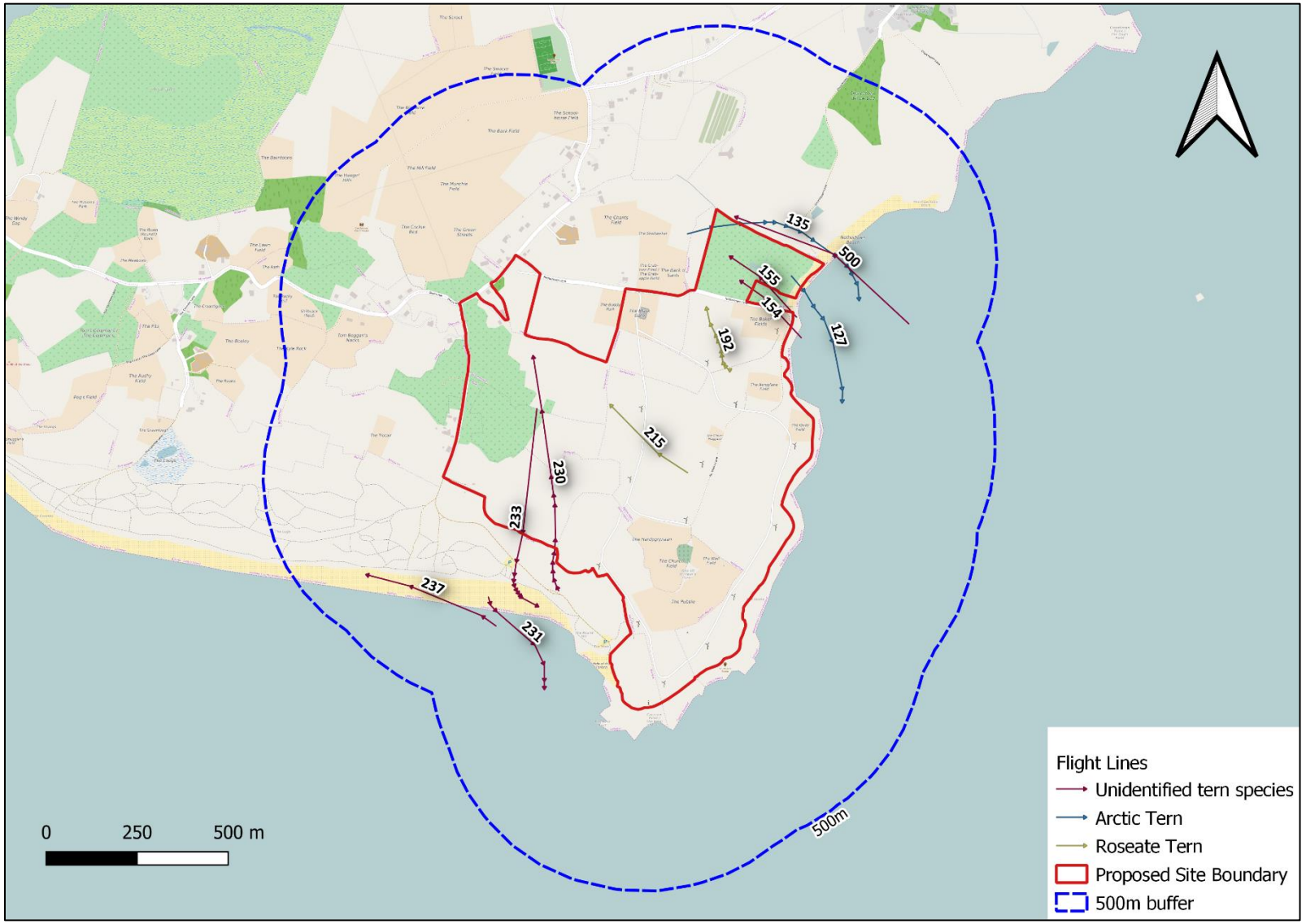

Figure 8: Arctic Tern, Roseate Tern and Unidentified Tern Species Flight Lines

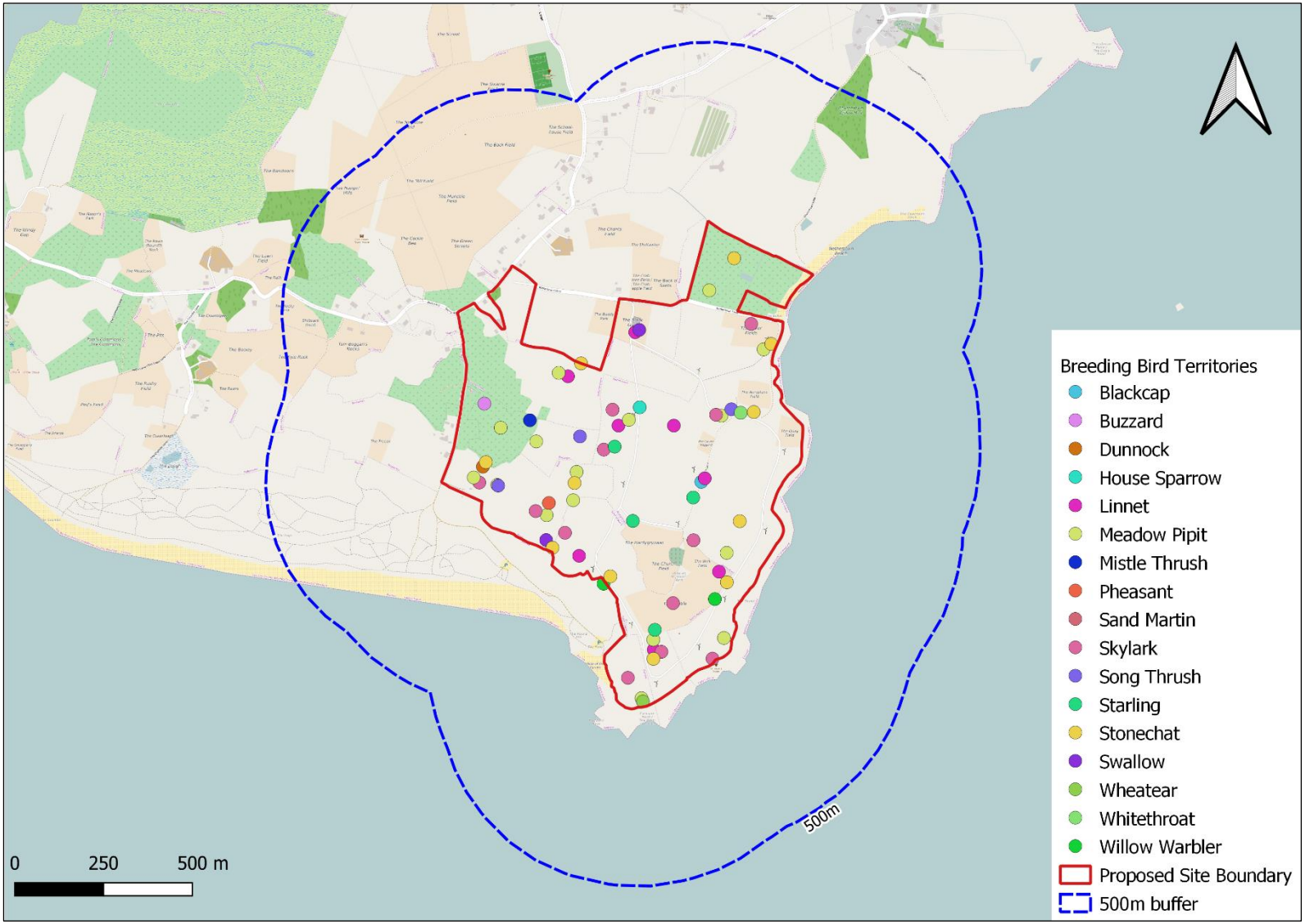

Figure 9: Breeding Bird Territories Identified within the Site.

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														✓				✓
211	17/06/20	1	13:31	CN	1	15	2	2														✓				✓
212	17/06/20	1	13:37	CN	1	15	2	2														✓				✓
213	17/06/20	1	13:40	CN	1	15	2	2														✓				✓
214	17/06/20	1	13:49	CN	1	45	2	2	2															✓		✓
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

APPENDIX 3 – PROPOSED DEVELOPMENT PROJECT DESCRIPTION

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

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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

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FIGURES

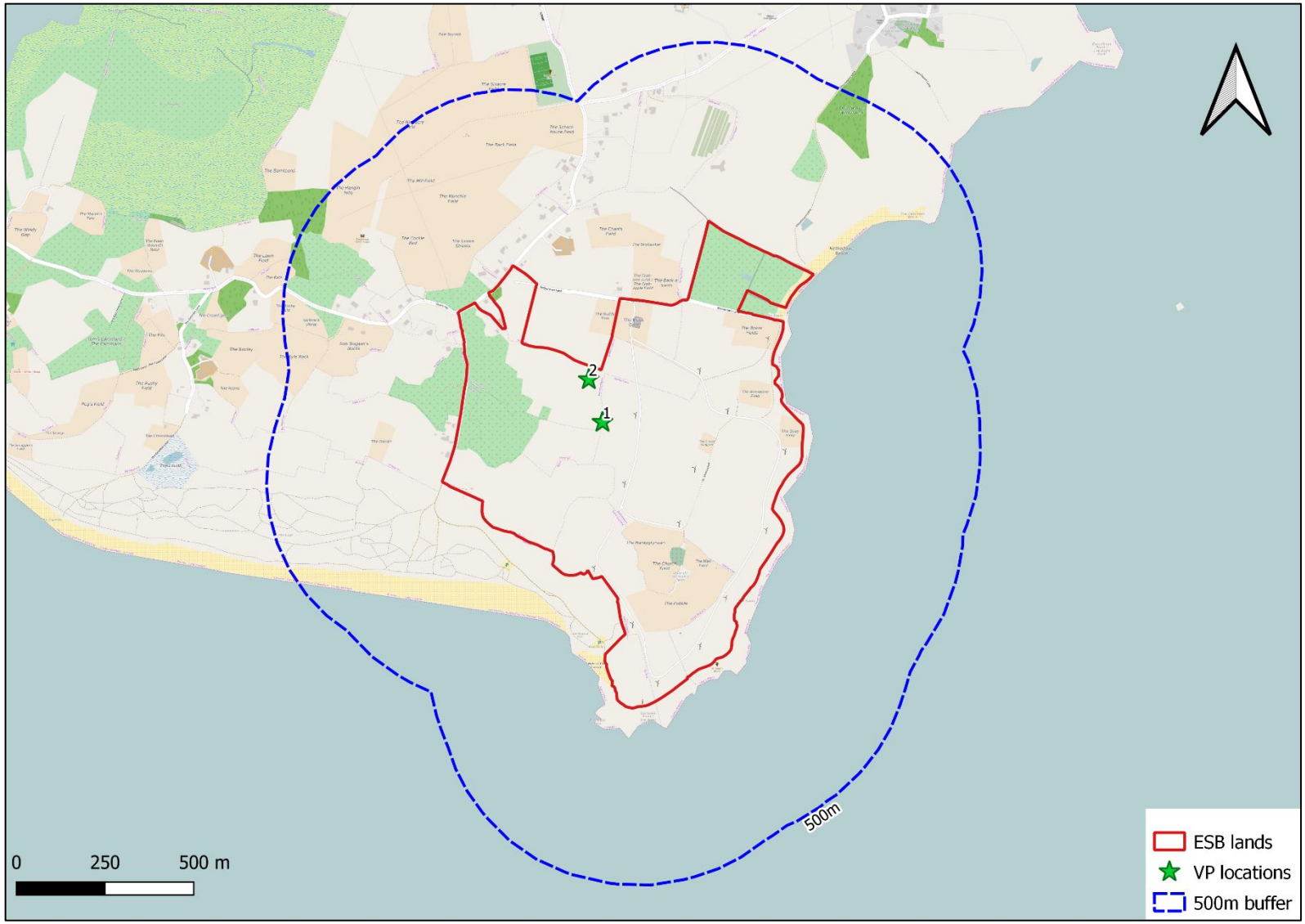

Figure 1: Ornithological survey area

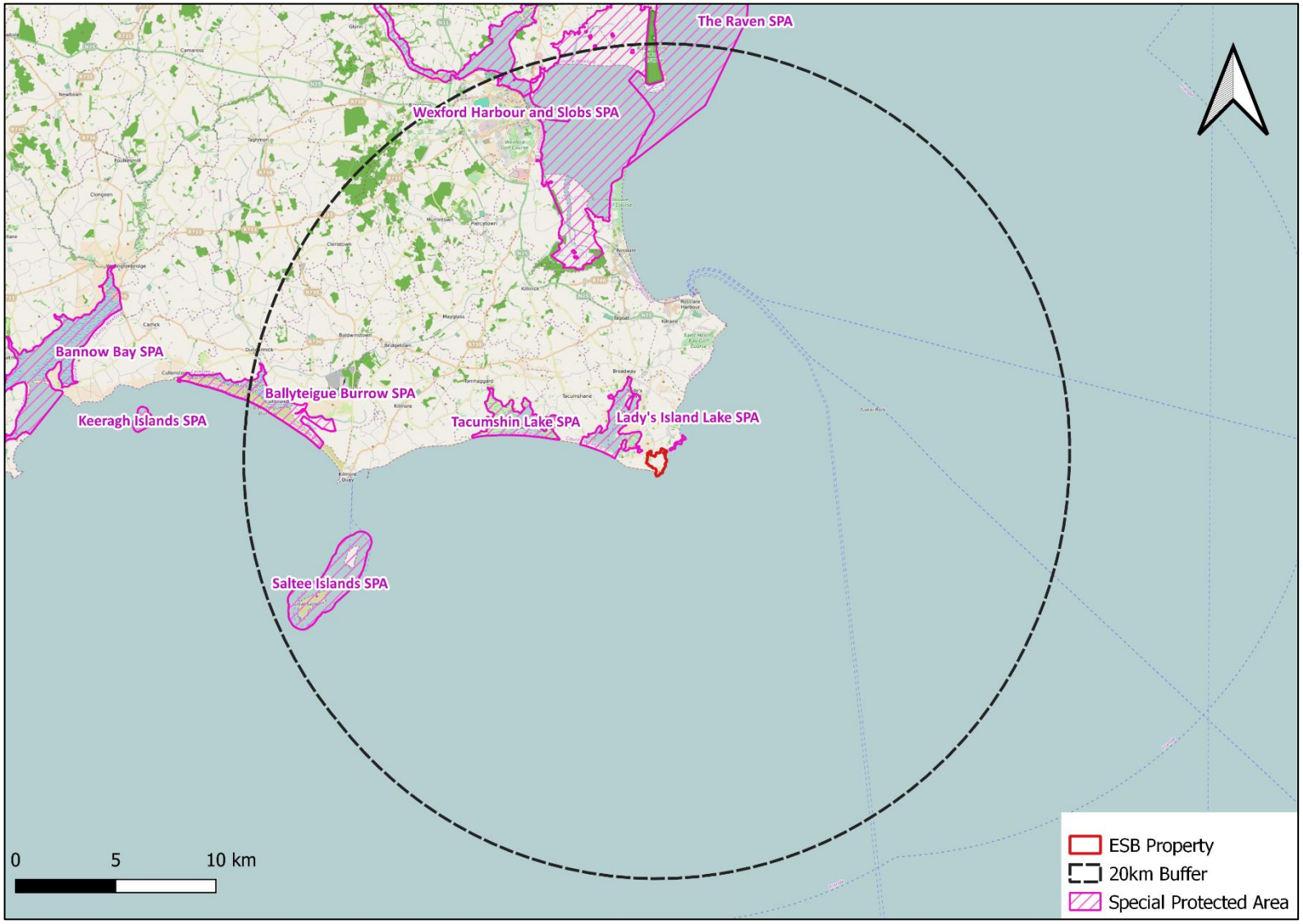

Figure 2: Special Protected Areas within 20km of the site

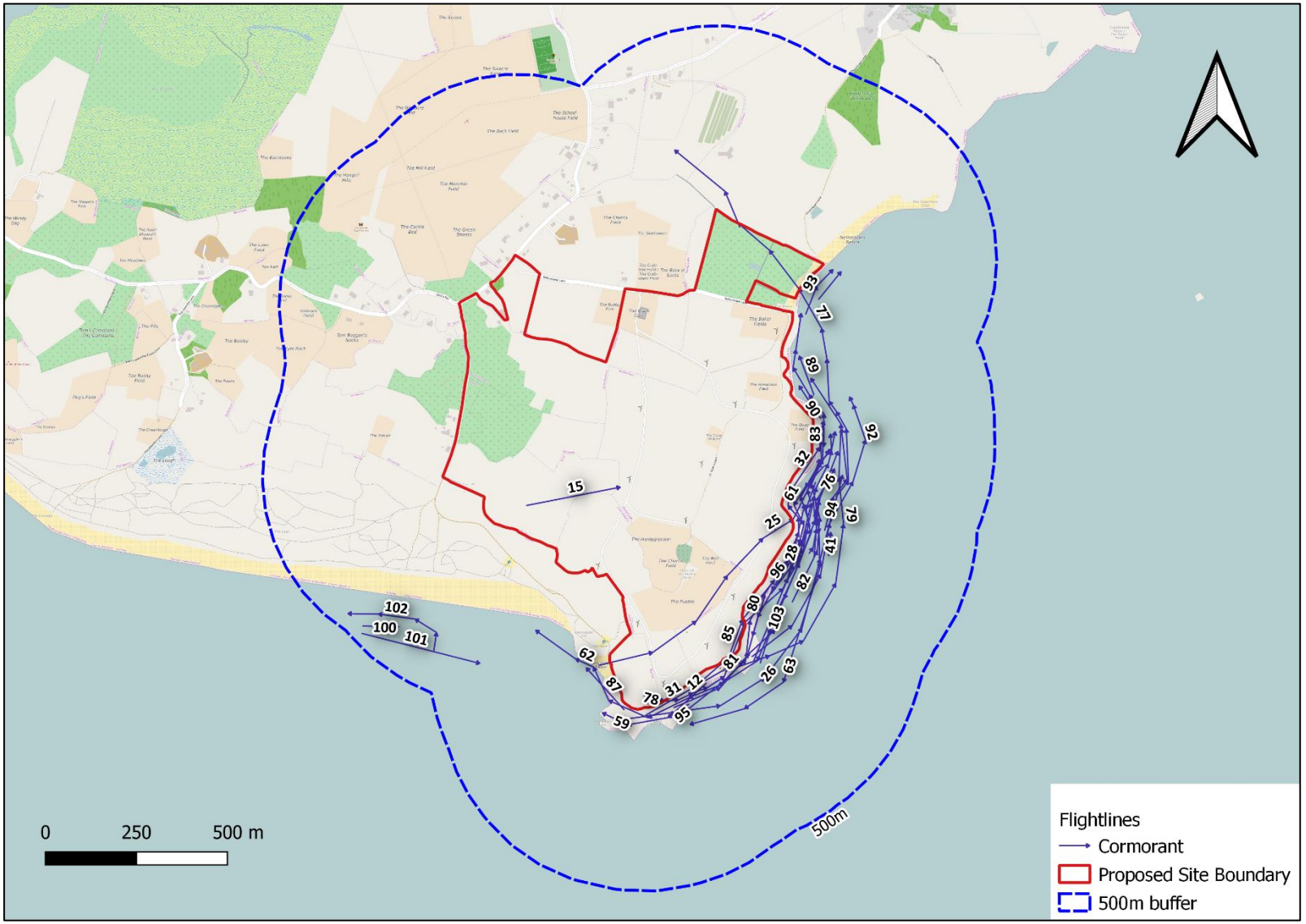

Figure 3: Cormorant Flight Lines

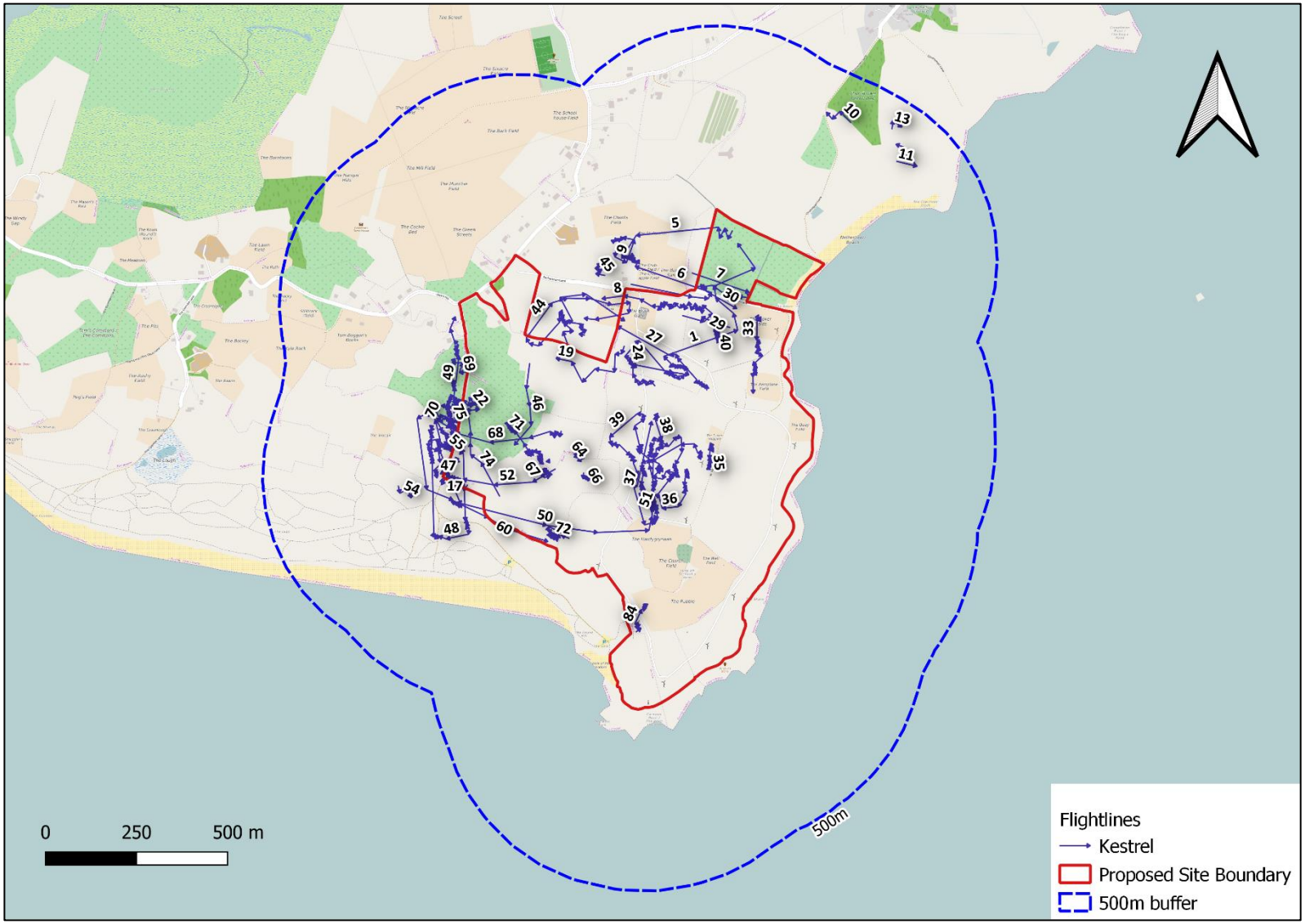

Figure 4: Kestrel Flight Lines

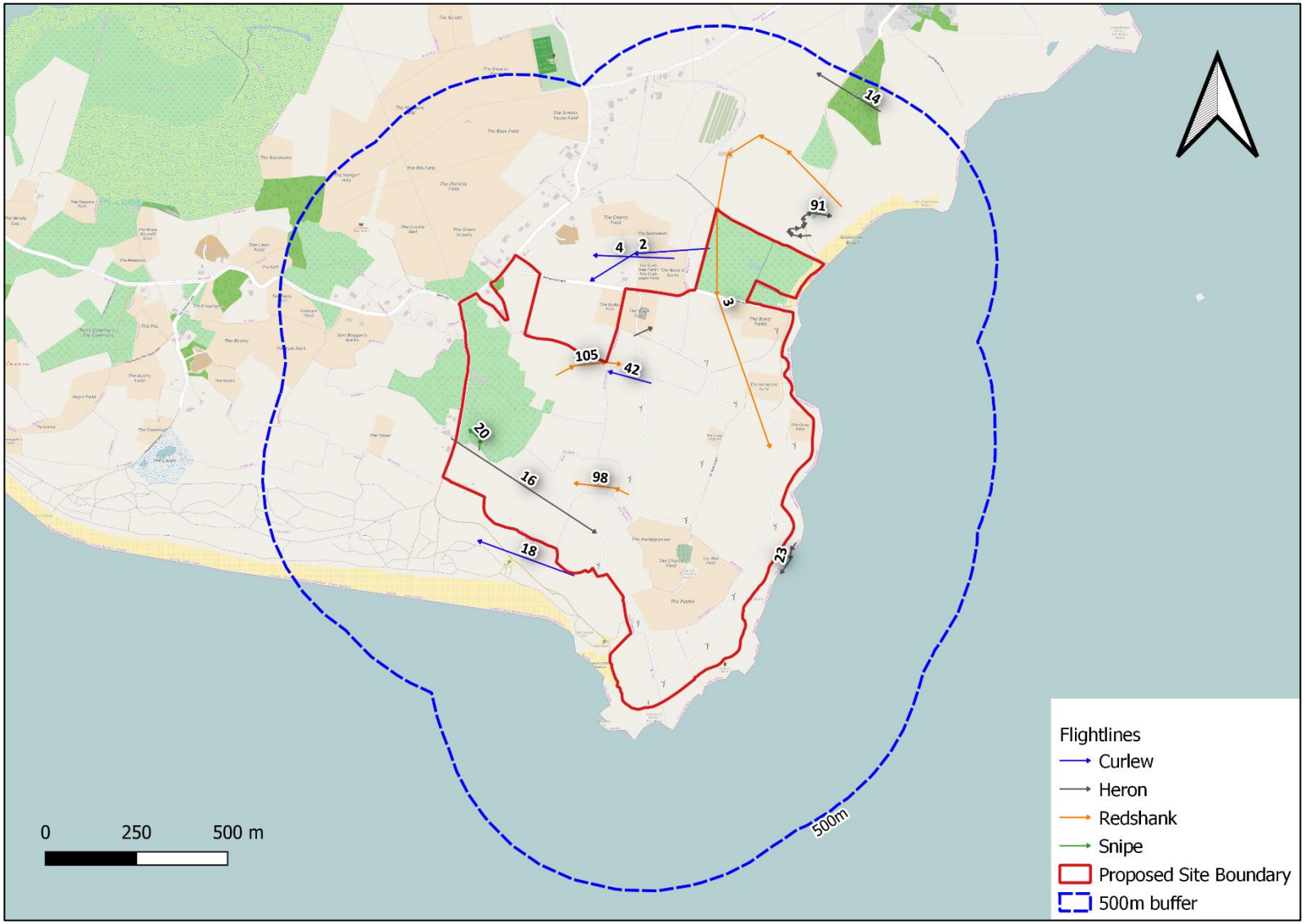

Figure 5: Curlew, Heron, Redshank, Snipe and Whooper Swan Flight Lines.

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	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		✓		✓
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									✓		✓
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	✓	✓	
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