

**FIRST YEAR ORNITHOLOGICAL SURVEYS -
INCHAMORE/GORTYRAHILLY WIND FARM SUMMER
2017 AND WINTER 2017 / 18**

SSE RENEWABLES

NOVEMBER 2018



FIRST YEAR ORNITHOLOGICAL SURVEYS - INCHAMORE/GORTYRAHILLY WIND FARM SUMMER 2017 AND WINTER 2017 / 18

User is Responsible for Checking the Revision Status of This Document

Rev. Nr.	Description of Changes:	Prepared by:	Checked by:	Approved by:	Date:
1	For Review Draft	LM/CF	JK	JH	08/11/2018

Client: SSE Generation

Keywords: Year 1, Ornithological Surveys, Wind Farm, Inchamore, Gortyrhilly,

Abstract: This report presents the results of the first year of ornithological surveys at the Inchamore/ Gortyrhilly Wind Farm site, from April 2017 to March 2018.

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
1.1 STUDY AREA	2
2. SURVEY METHODOLOGY	4
2.1 VANTAGE POINT SURVEYS	4
2.2 HINTERLAND SURVEYS	6
2.3 BREEDING MOORLAND SURVEYS	6
2.4 MERLIN SURVEYS	7
2.5 BREEDING BIRD SURVEYS	7
3. RESULTS	14
3.1 AVIAN USAGE OF THE STUDY AREA – VANTAGE POINT	14
3.2 TARGET SPECIES OBSERVATIONS	17
3.1 HINTERLAND SURVEY	20
3.2 MERLIN SURVEY	21
3.3 BREEDING MOORLAND SURVEY	24
3.4 GENERAL BREEDING BIRD SURVEY	24
4. DISCUSSION	28
5. REFERENCES	30

LIST OF APPENDICES

Appendix 1: VP Summer 2017 - Survey Details

Appendix 2: VP Winter 2017/2018 - Survey Details

Appendix 3: Bird Survey Observations

Appendix 4: Figures

LIST OF FIGURES

	<u>Page</u>
FIGURE 2-1: WIND FARM SITE BOUNDARY AND VANTAGE POINT LOCATIONS	9
FIGURE 2-2: HINTERLAND SURVEY AREA	10
FIGURE 2-3: BREEDING MOORLAND SURVEY TRANSECTS.....	11
FIGURE 2-4: MERLIN SURVEY SQUARES.....	12
FIGURE 2-5: BREEDING BIRD SURVEY TRANSECTS	13
FIGURE 3-1: MERLIN EVIDENCE	23

LIST OF TABLES

TABLE 2-1: VANTAGE POINT VIEWSHED AND TURBINES ENCOMPASSED.....	4
TABLE 2-2: GRID REFERENCES FOR VP LOCATIONS AT INCHAMORE/GORTYRAHILLY WIND FARM.....	5
TABLE 2-3: HINTERLAND SURVEY LOCATIONS.....	6
TABLE 2-4: BREEDING BIRD TRANSECT - SURVEY DETAILS.....	7
TABLE 2-5: MERLIN TRANSECT - SURVEY DETAILS.....	7
TABLE 2-6: BREEDING BIRD TRANSECT SURVEY DETAILS	8
TABLE 3-1: STATUS OF SPECIES OBSERVED.....	15
TABLE 3-2: HINTERLAND BIRD SPECIES RESULTS	21
TABLE 3-3: MERLIN TRANSECT – INDICATOR SIGNS.....	21
TABLE 3-4: NON-TARGET AVIAN SPECIES RECORDED DURING MERLIN SURVEY.....	22
TABLE 3-5: BREEDING MOORLAND TRANSECT LOCATIONS.....	24
TABLE 3-6: RESULTS OF BREEDING BIRD TRANSECTS SURVEYS A INCHAMORE DURING SUMMER 2017.	25
TABLE 3-7: RESULTS OF BREEDING BIRD TRANSECTS SURVEYS A GORTYRAHILLY DURING SUMMER 2017.....	26

EXECUTIVE SUMMARY

The methodology for the 2017/2018 ornithological survey at Inchamore Gortyrhillly Wind Farm adhered to Scottish Natural Heritage guidance (SNH, 2014) for assessing the impact of proposed wind farm developments on the local target species breeding and wintering populations. Two timed watches of three hours duration were carried out from each VP every month from April to September 2017 and October to March 2017/ 2018 inclusive, totalling 72 hours of observation time at each VP over the survey period. Breeding & Winter Bird Transect Survey, Hinterland Survey, and Merlin surveys were also assessed during this period.

During vantage point surveys, across the surveyed summer and winter periods of 2017/18, a total of 65 species of bird were noted. Of these species 6 are of Red status under the BoCCI, these include; Meadow Pipit, White-Tailed Eagle, Red Grouse, Grey Wagtail, Eurasian Curlew, and European Golden Plover, 23 are of Amber status and the remaining 36 are of Green status. An additional 5 of these species are protected under Annex I of the EU Birds Directive, these species include; Merlin, Peregrine Falcon, White-Tailed Eagle, Chough, and European Golden Plover.

No breeding wader target species were observed during surveys in 2017. Birds species observed within this survey include; Raven, Rook, Hooded Crow, Kestrel, Skylark, Meadow Pipit, Chaffinch, Goldcrest, Blackbird, Reed Bunting, Grasshopper Warbler, Willow Warbler, Lesser Redpoll, Mistle Thrush, Sparrowhawk, and Pheasant. These observations, during breeding wader surveys 2017, include one red listed species (Meadow Pipit) and five Amber-listed species (Kestrel, Skylark, Goldcrest, Mistle Thrush and Sparrowhawk).

During hinterland surveys on the site, four red listed species were identified as being present these include; White-Tailed Eagle, Lapwing, Black-headed Gull and Wigeon. Eight Amber-listed bird species were identified, these include; Chough, Coot, Cormorant, Goosander, Lesser-Black-backed Gull, Mute Swan, Snipe and Teal. Two green listed bird species were identified as being present during hinterland surveys. These include; Grey Heron and Mallard.

Indicator signs of Merlin, such as Pellets, droppings and feathers were identified during Merlin surveys. Merlin were observed only very occasionally during vantage point surveys throughout the site. Two Merlin observations, during winter surveys in March 2018 and November 2017, noted a female hunting/ commuting at vantage point 9 for 25s at a height of 0-20m and within the turbine buffer envelope. The remaining Merlin observation, noted at vantage point number 3, displays an individual flying both within and outside the rotor envelope for 37s at a height of 80-150m. A possible Merlin observation, during summer surveys, was recorded in July 2017 noted a possible individual calling from a conifer plantation at vantage point 1. Twenty bird species were recorded during Merlin surveys across the site. These species include; one Red listed species, five Amber, and fourteen Green listed species.

1. INTRODUCTION

Fehily Timoney & Company (FT) was appointed by SSE Generation to undertake ornithological surveys at the proposed Inchamore - Gortyrhilly Wind Farm from 2017-2018. This report presents the results of the first year of ornithological surveys and summarises the activity of specific target bird species during survey periods in 2017 and 2018. The study area of Inchamore - Gortyrhilly Wind Farm forms two separate site locations near Ballyvourney, Co. Cork. The site encompasses parts of the townlands of Derreenaling, Milleeny, Inchamore, Bardinch, Coumaclovane, Gortyrhilly, Rath West, Rath West, Derryfineen, Gortnabinna and Cahernacaha. This study area is located to the west of the town of Ballyvourney and adjacent to the N22 roadway.

This Avian assessment, for surveys completed over the first year in summer 2017 and winter 2017/18, includes the assessment of target bird species potentially occurring within the proposed site boundary, surveys of surrounding potentially bird-rich habitats and the assessment of individual specific species of interest. Surveys adhered to Scottish Natural Heritage guidance (SNH, 2014). The following surveys were carried out:

- Vantage Point Surveys (Breeding and Non-Breeding Season);
- Breeding Moorland Survey;
- Breeding & Winter Bird Transect Survey;
- Hinterland Survey;
- Merlin survey.

The monthly assessment of bird species, during the breeding and winter season, within the site was completed using vantage point survey watches. Surveys took place within 9 vantage point (VP) locations from April to August 2017 (inclusive) and October to March 2018 (Inclusive). Each VP was subject to two watches per month, each consisting of 3 hours in length (6 hours surveyed per VP per month).

Hinterland surveys were completed in potential favourable bird habitats within 10 km radius of the proposed wind farm development. This survey method was used to assess species populations surrounding the proposed development site. Breeding Bird Surveys were completed along transects within both sites. This survey technique was used in order to assess the presence of breeding waders within the area.

Merlin surveys, specifically for this bird of prey (*Falco columbarius*), were used in order to assess presence of the species within the proposed development site. Specific survey transects were used in order to accurately assess for the species. This report details the methodology used as well as findings for the period of April 2017 to March 2018.

1.1 Study Area

The proposed Inchamore – Gortyrhilly Wind Farm is within and surrounding the townlands of Inchamore and Gortyrhilly. This development is proposed to be located in two sections, one (Inchamore) along Cork-Kerry boarder, an estimated 18km south-east of the town of Killarney and 5km west of the town of Ballyvourney, and the other further to the south (Gortyrhilly) located approximately 3.2 km north of Ballingearry. Surrounding habitats and land uses are described by Corine 2012 as 'Forest' and 'semi-natural areas with transitional woodland scrub and Conifer Plantation' (324 & 314), 'Wetlands' (412) and 'Agricultural Areas' (243).

During site survey, habitats such as heath (HH), peatlands (PB), conifer plantation (WD4) and agricultural lands (GA/ GS) were noted (Fossitt, 2000). Areas of dry siliceous heath (HH1), dominant in Heather (Ling *Calluna vulgaris* and Bell Heather *Erica cinerea*) were identified throughout the site, particularly around turbine number 1. Areas of degraded heath were also present. Such heather dominant habitats have the potential to provide suitable habitat species such as Red Grouse (*Lagopus lagopus scoticus*) and for the prey species of birds of prey, such as Kestrels (*Falco tinnunculus*).

Areas of conifer plantation (WD4) are widespread throughout the site, with crops largely consisting non-native pine species (*Pinus* sp.). This habitat appears to be largely planted upon areas of degraded bog (PB) and

heath (HH). The edges of such habitats have the potential to provide nesting and feeding opportunities for Merlin (*Falco columbarius*).

Upland blanket bog (PB2) along with degraded areas of cutover bog (PB4) habitat was also present throughout the site. Areas of bog and flush (PB/PF) habitat were also present to the west of turbine number 4. These habitats have potential to provide roosting and foraging for wader species.

Cultivated (BC) and built land (BL3) is present throughout the site dwellings and agricultural sheds being most prominent. Areas of agricultural grassland (GA1) are particularly dominant throughout the lowland areas within and surrounding the site. Wet grassland areas (GS4) were also identified at the edges of such agricultural areas.

Protected European and national sites within the area include; Sillahertane Bog NHA (Site Code: 001882), St. Gobnet'S Wood NHA & SAC (Site Code: 000106), Killarney National Park, Macgillycuddy'S Reeks and Caragh River Catchment NHA & SAC (Site Code: 000365), Roughty River NHA (Site Code: 001376), Mullaghanish to Musheramore Mountains SPA (Site Code: 004162) and Mullaghanish Bog SAC (Site Code: 001890).

Musheramore Mountains SPA (Site Code: 004162) located approximately 2.95km north east of Inchamore is designated for Hen Harrier (*Circus cyaneus*). During the latest national survey conducted in 2015, it was noted that there has been an 80% decline recorded in the Mullaghanish to Musheramore Mountains SPA since 2005. Five confirmed Hen Harrier territories were noted within the SPA during the 2005 national survey (Barton *et al*, 2006), two confirmed and one possible territory during the third national survey in 2010 (Ruddock *et al*, 2012) and only one confirmed Hen Harrier territory in 2015 (Ruddock *et al*, 2016). The site also supports a breeding population of Merlin. The site synopsis¹ states that '*the population size is not well known but is likely to be one or two pairs.*'

¹ NPWS (2012). *Site Synopsis for the Mullaghanish to Musheramore Mountains SPA (Site Code: 004162)*. published 25/01/2012

2. SURVEY METHODOLOGY

The avian surveys carried out at the proposed wind farm adhered to Scottish Natural Heritage guidance (SNH, 2014) methodologies of the following survey types:

- Vantage Point Surveys (Breeding and Non-Breeding Season);
- Breeding Moorland Survey;
- Breeding & Winter Bird Transect Survey;
- Hinterland Survey;
- Merlin Survey.

2.1 Vantage Point Surveys

Vantage Point (VP) surveys were carried out at the proposed Inchamore-Gortyrhilly Wind Farm site from April 2017 to March 2018 during the non-breeding and breeding seasons, in accordance with the Scottish Natural Heritage Methodology for onshore wind farms (SNH, 2014). These surveys were divided into summer (April - September) 2017 and Winter (October - March) 2017/ 2018 seasons. Nine fixed VP locations (VP1 to VP9) overlooking the study area were used during the VP surveys. VPs 1, 2, 3 and 4 covered the northern Inchamore section of the study area whereas, VPs 5, 6, 7, 8 and 9 covered the southern Gortyrhilly section. Table 2-2 gives the VP locations. Vantage points were chosen to cover a specific viewshed of the proposed development site. Each was chosen specifically to encompass the view of all the proposed turbines.

The main purposes of vantage point survey watches are to:

1. Collect data on *target species* that will enable estimates to be made of:
 - a. The time spent flying over the defined survey area;
 - b. The relative use of different parts of the defined survey area; and
 - c. The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and rotor hub height.

The specific vantage points and turbines within their viewsheds can be seen in the table, below.

Table 2-1: Vantage point viewshed and turbines encompassed

Vantage Point	Turbine number(s) covered in viewshed
VP1	1, 5, 6, 4, 10, 8, 7, 12, 11, 16, 15, 21 and 13
VP2	14, 17 and 18
VP3	9, 2 and 3
VP4	19, 22, 24, 25, 23, 21 and 20
VP5	31, 32, 33 and 34
VP6	58, 57 and 53
VP7	46, 47, 44, 43, 41, 40, 38, 37, 35, 26 and 27
VP8	30, 29, 28 and 36
VP9	48, 50, 49, 45, 51, 54, 55, 52, 42, 53, 56, 39, 57 and 58

Vantage point locations were based on observations from walkover/reconnaissance surveys, viewshed analysis (using GIS) and collated information on known feeding and roosting sites from both desktop review and consultation. The number and location of vantage points was selected in order to achieve visibility of the entire study area and important features for birds in close proximity to the site (e.g. lakes, wetlands).

In line with recommended best practice (SNH, 2014 and Band *et al.* 2007), viewshed analysis was undertaken using ARCMAP 10.3, to calculate a theoretical zone of visibility from each vantage point. Visibility is calculated from each vantage point along an invisible layer suspended at the predicted lowermost height passed through by the rotor blade tips, using an observer height of 1.5m. We note the following from SNH guidance in respect of priority areas for viewshed analysis (emphasis added):

*"Where the key purpose is to estimate the risk of collision with turbines, **it is the visibility of the airspace to be occupied by the turbine rotors (the collision risk volume) that is of prime importance.** Therefore it is recommended that visibility be calculated using the least visible part of this airspace, i.e. an imaginary layer suspended at the lowermost height passed through by the rotor blade tips (typically about 20-30m above ground level). Predicting visibility at this level is a simple task using GIS. Being able to view all or most of the site to ground level can be helpful in gauging overall bird activity and usage of the site, but is not as important as being able to view the collision risk volume."*

Following SNH guidance (2014) and subsequent to consultation, watches were conducted to sampling diurnal, crepuscular and nocturnal activity of target species, and exceeding the required effort from SNH.

Data recorded included flight activity of target species (flight height, duration, directionality) in addition to metrics such as flock size (per recorded transit) and time of observation relative. Detailed notes of each observation of a target bird species was recorded including behaviour, gender (where possible), numbers, flight height, associated habitat and the period of time spent within the study area. Successful foraging events were also noted if they arose. Other bird species seen or heard during the VP surveys were also recorded on a casual basis and were considered separately in the analysis as additional species. Flight activity was annotated onto field maps. Total numbers of birds present both on arrival at the vantage point (when relative) and on departure (when relative) is noted. Details of each flight-path observation are provided in Section 3. Binoculars are used to scan for target species. Dictaphones are utilised to dictate bird heights whilst tracking flight events.

Flight heights are estimated visually as allowed for in SNH (2014) guidance. Flight height estimation using a clinometer or rangefinder is accepted as an *alternative* means of determining flight height however this is often not practicable (equipment may be clumsy and birds may be lost from view whilst trying to focus additional equipment on a target species rapidly moving out of sight); it should be noted that in practice many flocks of swans do not fly close enough to a surveyor for a rangefinder to be used, resulting in most flights heights being estimated in any case. As is often the case an experienced observer will be able to record accurate observations at a higher frequency resulting in a larger dataset for analysis.

As previously mentioned VP surveys were carried out at the site from April 2017 to March 2018 inclusive (see Table 2-1 for details) and involved carrying out 2 x 3 hour VPs at each VP every month. As per SNH guidance (2014) thirty-six hours of vantage point effort was carried out at each vantage point during the wintering period and breeding period. The proportion of survey time that activity was recorded inside and outside the wind farm site boundary was used as part of the overall analysis and assessment of target species usage of the study area. Vantage point locations can be found in Table 2-2, below. All surveys were conducted during suitable weather conditions.

Table 2-2: Grid References for VP locations at Inchamore/Gortyrähilly Wind Farm

Vantage Point	Location (ITM)
VP1	512600 578973
VP2	512393 578592
VP3	514385 579799
VP4	510657 576557
VP5	511897 572251
VP6	518270 572901
VP7	515686 572534
VP8	515184 574573
VP9	516014 570969

2.2 Hinterland Surveys

Hinterland surveys were undertaken following methodology (Bibby *et al*, 2000). The surveys were carried out in suitable wetland habitats and lakes in the area surrounding the proposed wind farm site. To determine the numbers and species of wetland birds in the area, a hinterland survey was undertaken over an area of 10 km from the proposed wind farm site and was comprised of six lake/wetland sites. Surveys were carried out October (24th), November (17th, 20th and 21st) and December (9th and 29th) of 2017 and January (28th and 29th), February (1st) and March (15th and 24th) 2018. The following site were checked monthly Grousemount, the Gearagh, Inchigeelagh, Lough Allua (Ballingeary), Lough Nabuddoga, Sillahtane Wind Farm. The species and abundance of the wetland birds were monitored using short Vantage Point watches (of between 1 hr and 3 hr 50 mins duration). Table 2-3 indicates where within the 10 km area around the proposed Wind Farm hinterland surveys were carried out.

Table 2-3: Hinterland Survey Locations

Location	Grid reference	Dates visited
Lough Nabuddoga	506728 573791	15/03/2018, 29/01/2018, 21/11/2017 & 24/10/2017
Inchigeelagh	522331 566141	24/03/2018 & 29/12/2017
Grousemont	509274 569529	28/01/2018
Gearagh	531400 570836	02/02/2018, 17/11/2017, 20/11/2017 & 29/12/2017.
Lough Allua	518735 565624	20/11/2017 & 29/12/2017
Sillahtane Windfarm entrance	510719 573143	09/12/2017

2.3 Breeding Moorland Surveys

Survey transects to assess the presence of breeding moorland populations were completed in May, June and July 2017. Breeding birds were surveyed using methodology of the breeding wader survey and breeding moorland survey, following Bibby *et al*, (2000) and Gilbert *et al*, (1998). Four transects, of approximately, was used within the site.

As recommended by Scottish National Heritage (2014), upland breeding moorland surveys should be completed using transects with 4 visits during mid-April early July. Two years' survey is required unless shorter survey period has been justified. All species encountered (seen or heard) on the transect were recorded and their abundance noted. Any species occurring more than 100 m from the observer, or flying over the site and not using it, were recorded as 'additional' species to further inform the baseline survey.

Table 2-4 Breeding Bird Transect - Survey Details

Date	Site	Cloud (Okta)	Precipitation	Wind
08/05/2017	Ballyvourney and Inchamore	1/8-0/8	Dry	F1-2-3
13/06/2017	Inchamore	6/8-8/8	Dry	F0-5
14/06/2017	Gortyrhilly	6/8-8/8	Dry	F2-4
07/07/2017	Inchamore and Gortyrhilly	6/8-2/8	Dry	F0-1
17/07/2017	Inchamore and Gortyrhilly	1/8-2/8	Dry	F3-4

2.4 Merlin Surveys

Merlin surveys, specifically for the bird of prey (*Falco columbarius*), in order to assess the presence of the species within the proposed development site. Specific Merlin survey transects were used in order to accurately assess for the species (Gilbert, G. *et al.*, 1998).

Four visits, of potential Merlin habitat, were completed between May and July 2017. Such habitat types included areas of heather, moorland, forestry plantation edges and young plantations and open woodland below, 600m in altitude (Gilbert, G. *et al.*, 1998). Within all Merlin suitable areas, merlin observations, nests and evidence were recorded.

Weather conditions, including, precipitation, cloud cover and wind were measured at the start of all surveys. Table 2-5 displays the survey details of Merlin surveys within the site.

Table 2-5: Merlin Transect - Survey Details

Date	Cloud (Okta)	Precipitation	Wind
08/05/2017	1/8	Dry	F 2-3
08/05/2017	1/8-0/8	Dry	F 2-3
25/05/2017	8/8	Mist – No rain	F 2-3W
03/06/2017	6/8	Showers	F 3
01/07/2017	8/8	Dry	F5-6W

2.5 Breeding Bird Surveys

For general breeding birds the method utilised was based on the existing British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS) (Biddy *et al.*, 2000). The study area for this survey comprised a total of 8 no. c. 1 kilometre transects which were selected and centred on different habitats present within the subject sites (See Figure 2-1 for the location of transects.). Four transects were located in both the Inchamore and Gortyrhilly Wind Farm sites. For each site birds were counted over two visits, each timed to coincide with the early part of the breeding season (April to mid-May 2017 and 2018) and later part of the season (mid-May to late June 2017 and 2018) with visits at least four weeks apart. Surveyors recorded all birds seen or heard as they walked methodically along the transect routes. Birds were noted in four distance categories, measured at right angles to the transect line (within 25m, between 25m-100m and over 100m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018).

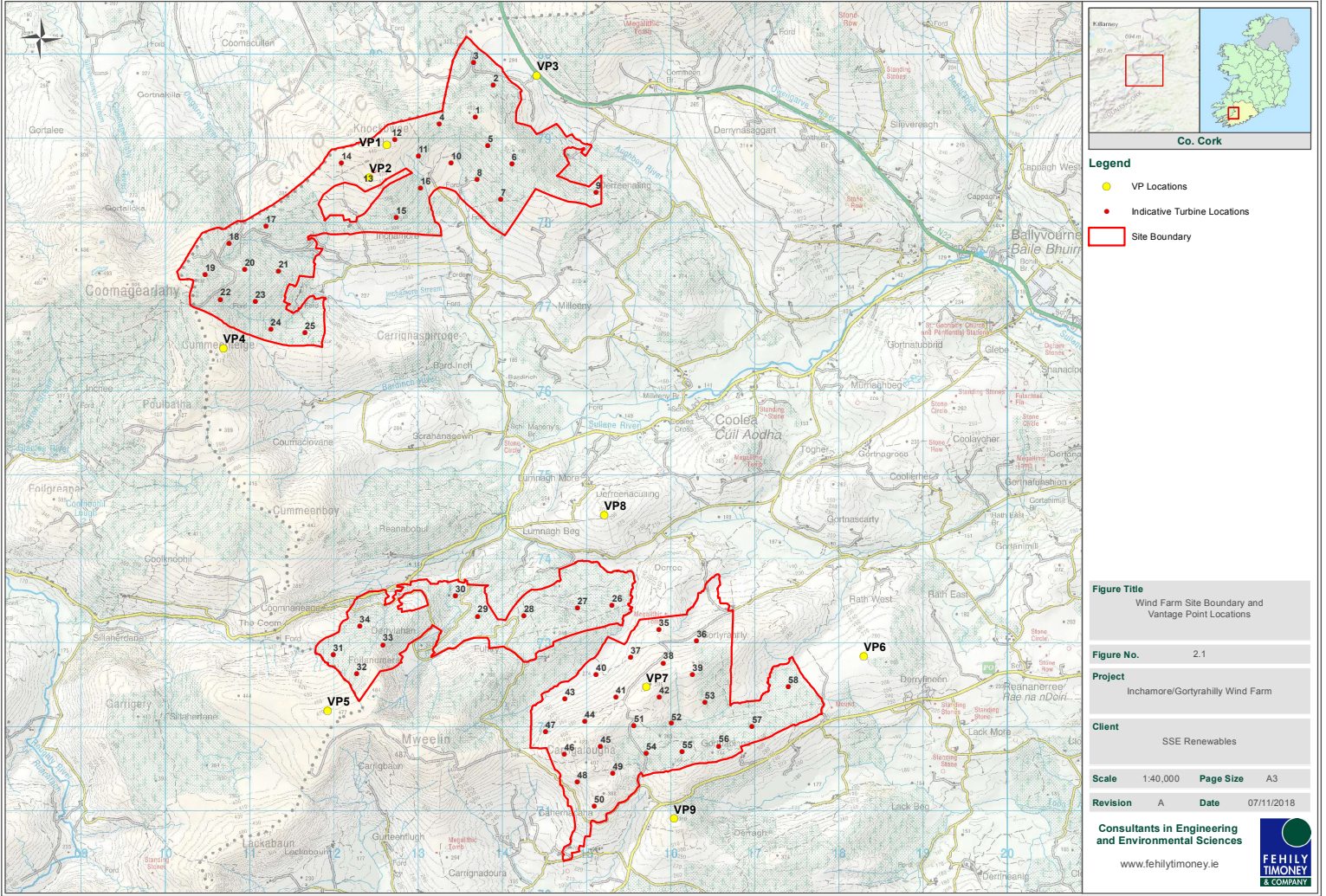
SNH guidance on recommended bird survey methods to inform impact assessment of onshore wind farms states:

"Surveys of farmland passerines especially on more intensive arable habitat are generally not required" (SNH 2014).

The breeding bird transect schedule is available in Table 2.6. The results are presented in Table 3.6 and 3.7.

Table 2-6: Breeding Bird Transect Survey Details

Date	Transect	Time	Weather Conditions
16.05.2017	1N	11.33	Cloud: 3/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
16.05.2017	2N	09.30	Cloud: 5/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
16.05.2017	3N	10.01	Cloud: 7/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
16.05.2017	4N	12.45	Cloud: 5/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
16.05.2017	1S	17.16	Cloud: 3/8 oktas, Rain: Dry, Wind: Beaufort 3-4, Visibility: Very Good
16.05.2017	2S	13.39	Cloud: 3/8 oktas, Rain: Dry, Wind: Beaufort 2-3, Visibility: Very Good
16.05.2017	3S	14.36	Cloud: 1/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
16.05.2017	4S	16.08	Cloud: 1/8 - 5/8 oktas, Rain: Dry, Wind: Beaufort 2-5, Visibility: Very Good
19.06.2017	1N	17.55	Cloud: 6/8 oktas, Rain: Dry, Wind: Beaufort 0-1, Visibility: Very Good
13.06.2017	2N	14.55	Cloud: 8/8 oktas, Rain: Dry, Wind: Beaufort 3-4, Visibility: Very Good
13.06.2017	3N	15.42	Cloud: 8/8 oktas, Rain: Dry, Wind: Beaufort 3-4, Visibility: Very Good
13.06.2017	4N	17.35	Cloud: 7/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
01.07.2017	1S	11.21	Cloud: 8/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
14.06.2017	2S	13.44	Cloud: 0/8 oktas, Rain: Dry, Wind: Beaufort 2-3, Visibility: Very Good
14.06.2017	3S	14.47	Cloud: 8/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good
14.06.2017	4S	12.05	Cloud: 6/8 oktas, Rain: Dry, Wind: Beaufort 3, Visibility: Very Good



Legend

- VP Locations
- Indicative Turbine Locations
- Site Boundary

Figure Title
Wind Farm Site Boundary and Vantage Point Locations

Figure No. 2.1

Project
Inchmore/Gortyrally Wind Farm

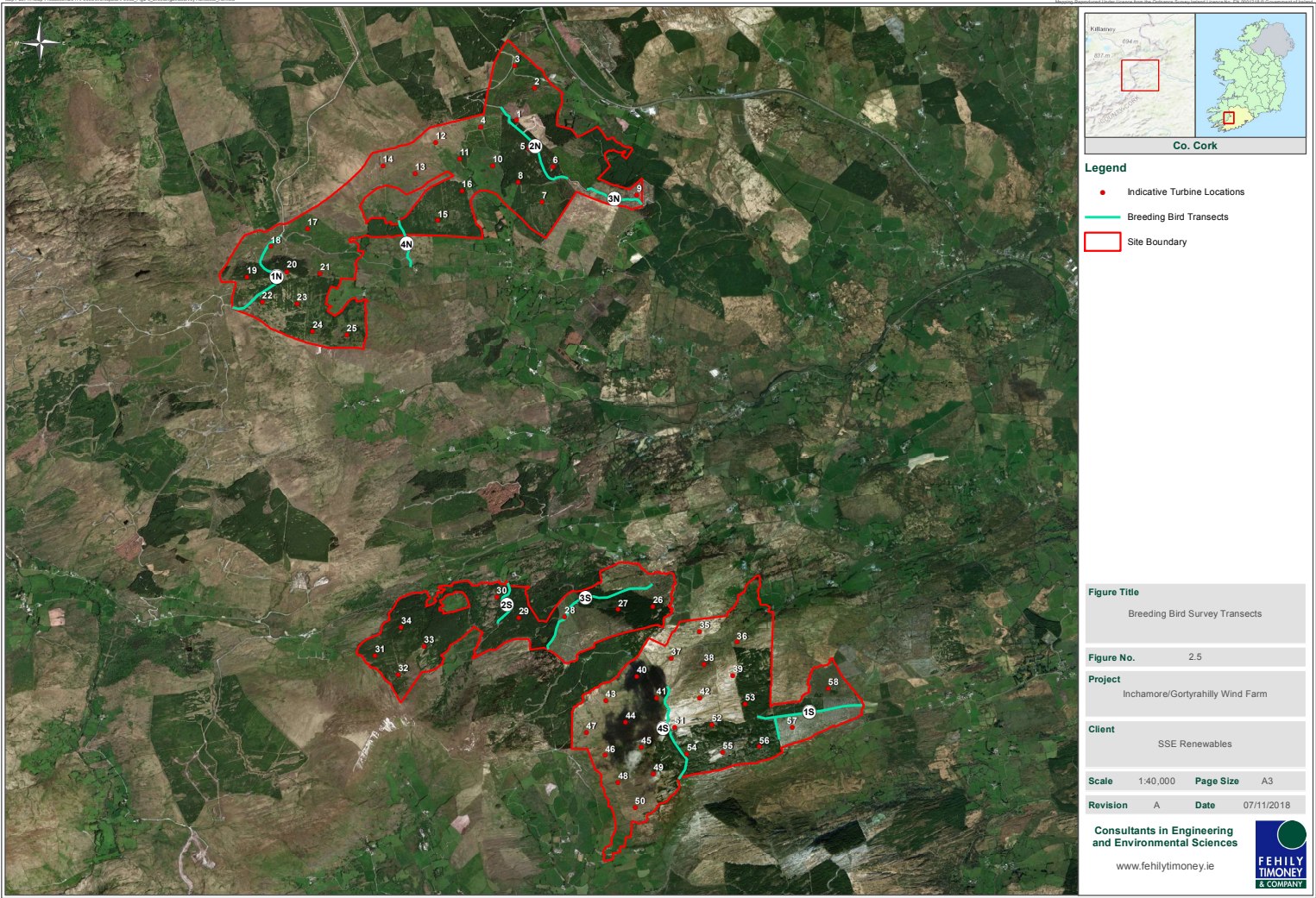
Client
SSE Renewables

Scale 1:40,000 **Page Size** A3

Revision A **Date** 07/11/2018

Consultants in Engineering and Environmental Sciences
www.fehilytimoney.ie

0 0.5 1 2 Kilometers



Legend

- Indicative Turbine Locations
- Breeding Bird Transects
- Site Boundary

Figure Title
Breeding Bird Survey Transects

Figure No. 2.5

Project
Inchamore/Gortyrally Wind Farm

Client
SSE Renewables

Scale 1:40,000 **Page Size** A3

Revision A **Date** 07/11/2018

Consultants in Engineering and Environmental Sciences
www.fehilytimoney.ie

0 0.5 1 2 Kilometers

3. RESULTS

3.1 Avian usage of the Study Area – Vantage point

Two timed watches of three hours duration each were carried out at each of the nine vantage points every month from April 2017 to March 2018, inclusive. This surveying effort totals to 72 hours of observation time at each VP over the survey period (see Appendix 3). Bird activity was recorded from the VPs every month. Table 3.1 shows all of the species recorded during surveys. In total there were 252 individual flight lines of 14 target species were observed during the survey period.

In total 65 species of bird were noted. Of these species 7 are of Red status under the BoCCI, these include; Meadow Pipit, White-Tailed Eagle, Red Grouse, Grey Wagtail, Eurasian Curlew, Woodcock, and European Golden Plover, 22 are of Amber status and the remaining 36 are of Green status. An additional 5 of these species are protected under Annex I of the EU Birds Directive, these species include; Merlin, Peregrine Falcon, White-Tailed Eagle, Chough, and European Golden Plover. Table 3.1, below, details the protection of all 64 species.

3.1.1 Summary Results Summer 2017 (April - August)

Inchamore was the quieter of the two sites during the summer 2017 season with little activity of note found during surveys. There was a number of observations, particularly of Kestrel, Sparrowhawk, and a single observation of an unidentified bird of prey during this period. Kestrels were observed on eight occasions and Sparrowhawk on five during summer vantage point surveys 2017. No target species flightlines were recorded at vantage point number 4 during this period.

More activity was noted at the Gortyrhilly site but no evidence of breeding activity for any of the main species Merlin, White-tailed Eagles, Hen Harrier, Peregrine, etc. There were a handful of observations of White-tailed Eagles (a pair) commuting and foraging around the greater area predominantly outside the site but they were not recorded nesting within the site. Kestrel were recorded on thirty-one occasions during this period. Woodcock, Snipe and Red Grouse are considered to be breeding within both sites.

3.1.2 Summary Results Winter 2017/18 (Oct - Mar)

Golden Plover (Annex I species)

During the first month of winter surveys a flock of Golden Plover (35) landed in the Gortyrhilly site but these are thought to be passing through on their way to winter grounds and we will monitor over the course of the season. Golden Plover were noted at five Vantage points during the month of November namely VPs 1, 2, 4, 6, 7 and 9. Nineteen observations were noted at VP 1 both inside and outside the site, numbers observed during this period ranged from 11 to 70. The majority of Golden Plover sightings were noted within and near the Inchamore site with similar number recorded between the months of December to March. The maximum number recorded was 90 at VP4 during the January survey.

Within the Gortyrhilly site observation of Golden Plover were less frequent. The main records of note were of 2 observations of a flock of 25-30 Golden Plover at VP 6 in November 2017, 2 observation of C. 30 individuals from VP 7 in February and a single observation of a flock of 30 individuals at VP 5 in October 2017.

Hen Harrier (Annex I species)

There were six observations of Hen Harrier over the winter period at Inchamore. Five observations were of a single male Hen Harrier hunting and commuting over and near the site. The other sighting was of a ringtail (1st year bird) from VP 2 in February 2018.

There were 10 observations of Hen Harrier from VPs at the Gortyrhilly site. Seven of these were of a male, the remaining three were ringtail (1st year bird). There was no roosting recorded in either site, they do however make up part of a territory for one family.

White-tailed Eagle (Red listed species)

White-tailed Eagle was noted on one occasion at Inchamore over the survey period. One individual was noted from VP 1 in January 2018 record outside and partially within but at a very high elevation.

There were also three observations of white-tailed eagle at Gortyrhilly during this survey period. In April 2017 at VP5 a single individual was observed outside of site hovering and commuting. In February 2018, again, at VP 5 an individual was noted feeding on dead sheep within the buffer, it flew west outside of buffer and out of site. This individual later returned for a number of seconds.

Two eagle observations were noted during hinterland surveys in 2018. In March an individual was noted flying east from Lough Nabuddoga towards Sillahertane. The remaining observation, in January, noted an individual flying west of Grousemount, also towards Sillahertane.

A pair of eagles were noted to the east of the Gortyrhilly site near the Grousemount Wind Farm site. There were however a low number of observations at the Inchamore / Gortyrhilly sites.

Chough (Annex I species)

There was one observation of Chough within the Inchamore Wind Farm site during survey in 2017/18. This observation, in November 2017, noted a single individual at VP 4. There were eleven observation of chough in the Gortyrhilly site. Four observations of Chough (inside the site) were noted from VP 7 during November. Six observations of Chough (5 out / 1 in) 1-4 individuals were noted from VP 8. Chough was also recorded at VP 7 and 9 in December and October 2017, respectively. There is a small group of chough known to breed around Baile Bhuirne we are investigating this further this summer. The species is an occasional visitor which may on occasion forage within the site.

Other species

Red Grouse observations and evidence were noted within the greater area and a number of instances within both areas. There were also occasional observations of kestrel and Sparrowhawk within both sites.

Table 3-1: Status of species observed

Scientific name	Common name	*BoCCI status	**Annex I status
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Amber	No
<i>Aegithalos caudatus</i>	Long-tailed Tit	Green	No
<i>Alauda arvensis</i>	Skylark	Amber	No
<i>Anas crecca</i>	Eurasian Teal	Amber	No
<i>Anas platyrhynchos</i>	Mallard	Green	No
<i>Anthus pratensis</i>	Meadow Pipit	Red	No
<i>Ardea cinerea</i>	Grey Heron	Green	No
<i>Buteo buteo</i>	Buzzard	Green	No
<i>Carduelis cannabina</i>	Common Linnet	Amber	No
<i>Carduelis cannabina</i>	Linnet	Amber	No
<i>Carduelis carduelis</i>	Goldfinch	Green	No
<i>Carduelis chloris</i>	European Greenfinch	Amber	No
<i>Carduelis chloris</i>	Greenfinch	Amber	No
<i>Carduelis flammea cabaret</i>	Lesser Redpoll	Green	No
<i>Carduelis spinus</i>	Siskin	Green	No

Scientific name	Common name	*BoCCI status	**Annex I status
<i>Circus cyaneus</i>	Hen Harrier	Amber	Yes
<i>Columba palumbus</i>	Woodpigeon	Green	No
<i>Corvus corax</i>	Raven	Green	No
<i>Corvus corone cornix</i>	Hooded Crow	Green	No
<i>Corvus frugilegus</i>	Rook	Green	No
<i>Corvus monedula</i>	Jackdaw	Green	No
<i>Corvus monedula</i>	Eastern Jackdaw	Not listed vagrant	No
<i>Cuculus canorus</i>	Cuckoo	Green	No
<i>Cyanistes caeruleus</i>	Blue Tit	Green	No
<i>Delichon urbicum</i>	House Martin	Amber	No
<i>Emberiza schoeniclus</i>	Reed Bunting	Green	No
<i>Erithacus rubecula</i>	European Robin	Amber	No
<i>Falco columbarius</i>	Merlin	Amber	Yes
<i>Falco peregrinus</i>	Peregrine Falcon	Green	Yes
<i>Falco tinnunculus</i>	Common Kestrel	Amber	No
<i>Fringilla coelebs</i>	Chaffinch	Green	No
<i>Gallinago gallinago</i>	Common Snipe	Amber	No
<i>Garrulus glandarius</i>	Jay	Green	No
<i>Haliaeetus albicilla</i>	White-Tailed Eagle	Red	Yes
<i>Hirundo rustica</i>	Swallow	Amber	No
<i>Lagopus lagopus</i>	Red Grouse	Red	No
<i>Larus fuscus</i>	Lesser Black-backed Gull	Amber	No
<i>Larus ridibundus</i>	Blackcap	Green	No
<i>Loxia curvirostra</i>	Crossbill	Green	No
<i>Motacilla alba yarrellii</i>	Pied Wagtail	Green	No
<i>Motacilla cinerea</i>	Grey Wagtail	Red	No
<i>Numenius arquata</i>	Eurasian Curlew	Red	No
<i>Numenius phaeopus</i>	Whimbrel	Green	No
<i>Oenanthe oenanthe</i>	Wheatear	Amber	No
<i>Parus major</i>	Great Tit	Green	No
<i>Periparus ater</i>	Coal Tit	Green	No
<i>Phalacrocorax carbo</i>	Cormorant	Amber	No
<i>Phasianus colchicus</i>	Pheasant	Green	No
<i>Phylloscopus collybita</i>	Chiffchaff	Green	No
<i>Phylloscopus trochilus</i>	Willow Warbler	Green	No
<i>Pica pica</i>	Magpie	Green	No
<i>Pluvialis apricaria</i>	European Golden Plover	Red	Yes

Scientific name	Common name	*BoCCI status	**Annex I status
<i>Prunella modularis</i>	Dunnock	Green	No
<i>Pyrrhula pyrrhula</i>	Bullfinch	Green	No
<i>Regulus regulus</i>	Goldcrest	Amber	No
<i>Saxicola torquata</i>	Stonechat	Amber	No
<i>Sturnus vulgaris</i>	Common Starling	Amber	No
<i>Troglodytes troglodytes</i>	Wren	Green	No
<i>Turdus pilaris</i>	Fieldfare	Green	No
<i>Turdus iliacus</i>	Redwing	Green	No
<i>Turdus merula</i>	Blackbird	Green	No
<i>Turdus philomelos</i>	Song Thrush	Green	No
<i>Turdus viscivorus</i>	Mistle Thrush	Amber	No
<i>Scolopax rusticola</i>	Woodcock	Red	No
<i>Pyrrhocorax pyrrhocorax</i>	Chough	Amber	Yes

* refers to the conservation status of the species according to Birds of Conservation Concern in Ireland

**refers to species listed on Annex I of the EU Birds Directive

3.2 Target Species observations

3.2.1 Grey Wagtail

Seven observations of this Red-listed species were observed during summer and winter vantage point surveys within the site. One observation, in May 2017, noted a male in his breeding plumage at vantage point number 3. This species is strongly associated with waterways and was observed within close proximity to streams draining the site. The species are considered to be breeding in the streams draining the Inchamore site.

3.2.2 Meadow Pipit

This Red-listed species was noted 105 times during both summer and winter vantage point surveys in 2017 and 2018. The species is present within the site all year round.

3.2.3 Golden Plover

This Red-listed and Annex I species was noted primarily during winter surveys in 2017/18, no Golden plover observations were made during Summer 2017. Golden Plover was observed from VPs 1 – 7 inclusive, with the greatest number of observations being noted at VP 1. Flock sizes at VP 1 ranged from 1 – 70, one observation at VP 1 in November noted how 4 flocks, of 10 individuals each, were flushed from the area. These flocks were in the site and flew for 18s at a height of between 0-20m. A number of observations appeared to have been flushed from the area on approach to VP 1.

Across the site Golden Plover was observed between the months of October to April 2018, inclusive. Golden Plover were recorded on 53 occasions during this survey period. Forty-one of these observations occurred within the site, 6 occurred outside and 6 occurred both inside and outside of the site. Many observations throughout the survey period were noted as flying over the site, with 10 of the total 53 observations noted as flying from the site or into the site. Typically, flocks flying from the site were flushed.

3.2.4 Snipe

Snipe, an Amber-listed bird species, was noted a total of 29 times across both summer and winter vantage point surveys in 2017 and 18. The species was found most often, however during winter surveys. During summer VP surveys Snipe was primarily observed during May at VP 6. During winter surveys observations were primarily of individuals and pairs. These flightlines noted 11 observations within the site, 8 outside and 3 both within and outside the site. It is likely that snipe over winters within this site. During winter surveys the species was noted in the months of November, January and February 2018 across VPs 1, 3, 4 and 5. The majority of species observations during winter surveys were flushed from the site, indicating the birds presence and potential use of the area for feeding.

3.2.5 White-tailed Eagle

White-tailed Eagle, a Red-listed and Annex I protected species, was observed on eight occasions during both summer and winter vantage point surveys in 2017 and 2018. During Winter surveys eagles were observed at VPs 1 and 5, in January and February 2018. There were three observations during this time, each noting an individual bird flying inside the site. These observations ranged in duration from 8 to 30 seconds, flight height ranged from between 0 to 40 metres.

There were four observations of eagle during summer 2017. Of these observations, 3 were noted as being outside the site, one was noted as being inside. The observation noted as being inside the site was of a pair in July at VP 5, this flight line duration lasted for 900 seconds and ranged in height with the majority of time, 780s, spent between 50 and 150 metres in height.

3.2.6 Hen harrier

Hen Harrier, an Amber-listed and Annex I protected species, was recorded primarily during the winter survey period, no records of the species were noted during the summer survey period. A total of 16 observations were noted during this period with 10 of the 16 observations identified as being inside the site. 3 observations were noted as being both within and outside of the site, with the remaining three being outside. Individuals of the species were solely observed during this period. The observations above detailed the flights of juvenile males, adult males and ringtails. One male with juvenile markings underneath and around the face, four ringtails and seven adult males were recorded during this period. Observations noted primarily wintering males, possibly passing over the site and roosting elsewhere. No females were noted during this survey.

3.2.7 Merlin

Merlin associated observations during this period have been included below in the merlin survey section (Section 3-4).

3.2.8 Woodcock

A single observation of this Red-listed species was recorded during winter vantage point surveys in 2017/ 18. This observation, taken at vantage point number 3, noted one individual observed flying low for a duration of 2 seconds from a conifer area within the site.

3.2.9 Sparrow hawk

Sparrowhawk, an Amber-listed species in Ireland, was observed on 15 occasions during the overall survey period. Overall the species was noted within the site on 4 occasions, it was noted as both within and outside on 3 occasions, and outside the site on 9 occasions.

3.2.10 Curlew

Curlew, a Red-listed species, was observed on two occasions during winter vantage point surveys in 2017/ 18.

Both observations noted a single individual at vantage point number 5 within the site. One individual was flushed whilst the surveyor was approaching the vantage point, the other was heard within the site also from this point.

3.2.11 Red Grouse

Red Grouse, a Red-listed species, was observed on 4 occasions during winter vantage point surveys in 2017/18. This species was noted to be present within the site on one occasion during this survey period. The species was also noted on one occasion to be both within and outside of the site and on two occasions noted as outside, these observations were noted at VPs 2, 4, 5, 9, and 8. Three records were also taken of grouse droppings during vantage point surveys at points 2, 5 and 4.

3.2.12 Peregrine Falcon

Two observations of peregrine Falcon, an Annex I protected bird species, were noted during both summer and winter vantage point surveys in 2017 and 18. Of these observations, one was noted both within and outside of the site, this observation noted an individual flying for a duration of 10s at a height of between 80-150m. The remaining observation was noted as being within the site and lasted for a duration of 10s at 0-20m.

3.2.13 Lesser-Black backed gull

Lesser Black-backed Gull, an Amber-listed species, were observed primarily at vantage point number 6 during summer vantage point surveys in 2017. Two observations made during this survey were noted as being within the site, one was noted both within and outside the site.

3.2.14 Buzzard

The single observation of this species was recorded at vantage number 5 at Gortyrhilly in September, during summer surveys in 2017. This observation noted a single individual flying from west to east across the site for a duration of 80s and at heights of over 150 meters at VP 5. This observation was noted as being within the site.

3.2.15 Kestrel

This Amber-listed species was noted 53 times during both summer and winter vantage point surveys in 2017 and 18. It is likely that this species resides within the site all year round. 36 observations were noted as being within the site, 12 observations were noted as being outside and 5 were noted as being both inside and outside. Many of these kestrel observations were made at VP 6.

3.2.16 Cormorant

Four observations of Cormorant, an Amber-listed species, were observed during summer and winter vantage point surveys within the site. Two of these observations were made at VP 6, with the remaining two being noted at VP 6 and 3. Only one observation was identified as being within the site, this noted a flock of three flying from east to west through the viewshed.

3.2.17 Mallard

Mallard was observed four times during this survey period.

3.2.18 Chough

Chough, an Amber-listed and Annex I protected species, was observed primarily during winter vantage point surveys in 2017/18. 9 observations of Chough were noted between October and December 2017, with three others being heard but not seen. Four of these observations were identified as being within the site, four others were noted as being outside. The remaining observation was noted as occurring both within and outside the site. The largest flock of Chough noted was of 4, but it was added that more than four individuals were heard. This observation noted flight of the flock for 578 seconds, primarily at a height of between 80-150 metres.

3.2.19 Teal

Teal, an Amber-listed species, was noted on two occasions during winter vantage point surveys 2017/18. Both observations were noted in April 2018 at vantage point 4 and were both identified as being within the site. These observations noted a flock of three individuals circling the area for 117 seconds at a height of between 0-20m. The other observation was similar but lasted for 12 seconds.

3.3 Hinterland Survey

Hinterland surveys to establish breeding occupancy within a 10 km radius of the site were carried out over an eleven-day period over 6 months across 2017 and 2018. The survey schedule and locations of the Hinterland watches are shown in Table 3-2, below. The hinterland surveys established the presence of six territories within an approximately 10 km radius of Inchamore – Gortyrhilly Wind Farm. Fourteen bird species were identified during Hinterland surveys within this 6-month period.

Four red listed species were identified as being present during Hinterland surveys, these include; White-tailed Eagle, Lapwing, Black-headed Gull and Wigeon. Eight amber listed bird species were identified, these include; Chough, Coot, Cormorant, Goosander, Lesser-Black-backed Gull, Mute Swan, Snipe and Teal. Two green listed bird species were identified as being present during Hinterland surveys. These include; Grey Heron and Mallard. A synopsis of these species can be found in Table 3-2, below.

White-tailed Eagle was recorded on two occasions during hinterland surveys. These observations, both in 2018, were noted at Lough Nabuddoga and Grousemount. Both individuals were adults and were observed to be flying in an easterly and westerly directions in relation to Sillahertane wind farm. Chough was recorded once throughout hinterland surveys, in December 2017. A flock of five individuals were observed to be feeding at the entrance on Sillahertane Wind Farm when the observation was made.

Chough, an amber listed species, and White-tailed Eagle, a red listed species in Ireland, are protected under Annex I of the Birds Directive.

Table 3-2: Hinterland Bird Species Results

Common Name	Scientific Name	Conservation Status	
		BoCCI*	Annex I**
Black-headed Gull	<i>Larus ridibundus</i>	Red	No
Chough	<i>Pyrhocorax pyrrhocorax</i>	Amber	Yes
Coot	<i>Fulica atra</i>	Amber	No
Cormorant	<i>Phalacrocorax carbo</i>	Amber	No
Goosander	<i>Mergus merganser</i>	Amber	No
Grey Heron	<i>Ardea cinerea</i>	Green	No
Lapwing	<i>Vanellus vanellus</i>	Red	No
Lesser-Black-backed Gull	<i>Larus fuscus</i>	Amber	No
Mallard	<i>Anas platyrhynchos</i>	Green	No
Mute Swan	<i>Cygnus olor</i>	Amber	No
Snipe	<i>Gallinago gallinago</i>	Amber	No
Teal	<i>Anas crecca</i>	Amber	No
White-Tailed Eagle	<i>Haliaeetus albicilla</i>	Red	Yes
Wigeon	<i>Anas penelope</i>	Red	No

* refers to the conservation status of the species according to Birds of Conservation Concern in Ireland

**refers to species listed on Annex I of the EU Birds Directive

3.4 Merlin Survey

No Merlin were observed during Merlin specific surveys throughout the site. Indicator signs of Merlin, such as Pellets, Droppings and Feathers were identified during Merlin surveys. These signs have been listed in table 3-3, over.

Table 3-3: Merlin Transect – Indicator signs

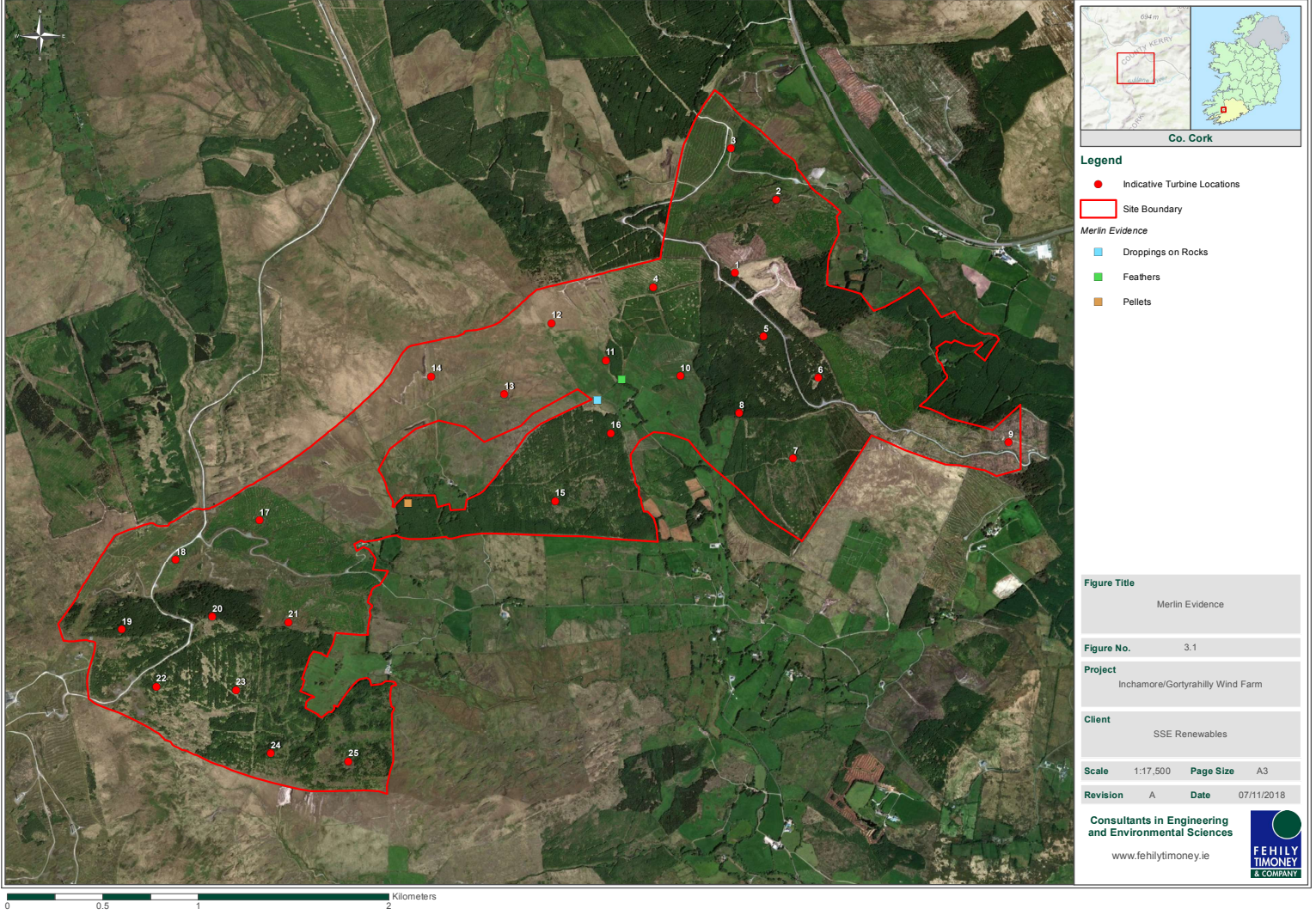
Date	Sign	Location	Notes
25/05/2017	Pellet	51.9483744, -9.2809656	Pellets found at location & several more nearby
25/05/2017	Feathers	51.9539560 -9.2648599	Feathers found
25/05/2017	Droppings	51.9528344 -9.2666969	Droppings on rocks

Merlin were observed only very occasionally during vantage point surveys throughout the site. Two Merlin observations, during winter surveys in November 2017 and March 2018, noted a female hunting/ commuting at vantage point 9 for 25s at a height of 0-20m and within the turbine buffer envelope. The remaining Merlin observation, noted at vantage point number 3, displays an individual flying both within and outside the rotor envelope for 37s at a height of 80-150m. A possible Merlin observation, during summer surveys, was recorded in July 2017 noted a possible individual calling from a conifer plantation at vantage point 1.

Twenty bird species were recorded during merlin surveys across the site. These species include; one red listed species, five amber, and fourteen green listed species. These can be found in Table 3-5, below.

Table 3-4: Non-Target Avian Species recorded During Merlin Survey

		Conservation Status	
Common Name	Scientific Name	BoCCI	Annex I*
Blackbird	<i>Turdus merula</i>	Green	No
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	No
Chaffinch	<i>Fringilla coelebs</i>	Green	No
Coal Tit	<i>Parus ater</i>	Green	No
Cormorant	<i>Phalacrocorax carbo</i>	Amber	No
Cuckoo	<i>Cuculus canorus</i>	Green	No
Grey Wagtail	<i>Motacilla cinerea</i>	Red	No
Goldcrest	<i>Regulus regulus</i>	Amber	No
Hooded Crow	<i>Corvus cornix</i>	Green	No
Kestrel	<i>Falco tinnunculus</i>	Amber	No
Meadow Pipit	<i>Anthus pratensis</i>	Red	No
Mistle Thrush	<i>Turdus viscivorus</i>	Amber	No
Raven	<i>Corvus corax</i>	Green	No
Robin	<i>Erithacus rubecula</i>	Amber	No
Siskin	<i>Carduelis spinus</i>	Green	No
Skylark	<i>Alauda arvensis</i>	Amber	No
Song Thrush	<i>Turdus philomelos</i>	Green	No
Stonechat	<i>Saxicola torquata</i>	Amber	No
Willow Warbler	<i>Phylloscopus trochilus</i>	Green	No
Wren	<i>Troglodytes troglodytes</i>	Green	No
Total number of species: 20			



0 0.5 1 2 Kilometers

3.5 Breeding Moorland Survey

Breeding moorland surveys were carried out over May, June and July 2017 across both sites. Transect areas were chosen due to their habitat and potential ability to support waders. Breeding birds were surveyed using methodology of the breeding moorland survey, following Bibby (2000) and Gilbert, G. *et al.*, (1998). Breeding moorland transects within the three locations have been listed in table 3-6, below.

Table 3-5: Breeding Moorland Transect locations

Date	Sign	Location	Notes
25/05/2017	Pellet	51.9483744, -9.2809656	Pellets found at location & several more nearby
25/05/2017	Feathers	51.9539560 -9.2648599	Feathers found
25/05/2017	Droppings	51.9528344 -9.2666969	Droppings on rocks

No breeding moorland target species were observed during this survey period. Non-target birds species observed within this survey include; Raven, Rook, Hooded Crow, Kestrel, Skylark, Meadow pipit, Chaffinch, Goldcrest, Blackbird, Reed Bunting, Grasshopper Warbler, Willow Warbler, Lesser Redpoll, Mistle Thrush, Sparrowhawk and Pheasant. These observations include one red listed species (Meadow Pipit) and five amber listed species (Kestrel, Skylark, Goldcrest, Mistle Thrush, and Sparrowhawk).

3.6 General Breeding Bird Survey

3.6.1 Inchamore

The results of the breeding bird transect survey at Inchamore are shown in Table 3.6. A total of twenty-two species were recorded along the transects. Two Red-listed species were recorded during surveys, namely Meadow Pipit and Grey Wagtail. Three Grey Wagtails were recorded during surveys with two records on the same date (19/06/2017) during the late visit on transect 1N. The third sighting of this species was during the early site along transect 2N. Meadow pipit were recorded only once during surveys a single individual recorded during the early visit (16/05/2017) along transect 1N

Seven Amber-listed species were recorded; Goldcrest, Kestrel, Robin, Skylark, Starling, Stonechat and Swallow.

3.6.2 Gortyrahilly

The results of the breeding bird transect survey at Gortyrahilly are shown in Table 3.7. A total of twenty-eight species were recorded along the transects. The same two Red-listed species were recorded during surveys, namely Meadow Pipit and Grey Wagtail. A pair of Grey Wagtails were recorded during the early visit along transect 1S on the 16th of May 2017. Meadow Pipit were recorded on the 14th of June 2017 along transect 3S. A total of six Meadow Pipits were recorded with one additional lone individual flying over the surveyor.

Five Amber-listed species were recorded; Goldcrest, Robin, Skylark, Stonechat and Swallow.

Section 3

Table 3-6: Results of breeding bird transects surveys a Inchamore during Summer 2017.

Common Name	Scientific Name	Early			Late			Early			Late			Early			Late			Early			Late		
		1N			2N			3N			4N			1N			2N			3N			4N		
		0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F
Blackbird	<i>Turdus merula</i>	1																							
Chaffinch	<i>Fringilla coelebs</i>	7	1		2	5		8		9	3		2	1		1	2		3				2	1	1
Coal Tit	<i>Parus ater</i>				1																				
Goldcrest	<i>Regulus regulus</i>	4	1		5			5		5									1						
Grey Wagtail	<i>Motacilla cinerea</i>				1		1	1																	
Hooded Crow	<i>Corvus cornix</i>										1				1								1		3
Kestrel	<i>Falco tinnunculus</i>																								1
Lesser Redpoll	<i>Acanthis cabaret</i>																								2
Long-Tailed Tit	<i>Aegithalos caudatus</i>	2			5			1		5														1	
Magpie	<i>Pica pica</i>				1												3	1					3	2	1
Meadow Pipit	<i>Anthus pratensis</i>	1																							
Raven	<i>Corvus corax</i>								1																
Robin	<i>Erithacus rubecula</i>		3	1	4			4		3	3			1						1					
Rook	<i>Corvus frugilegus</i>								1																
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	3																							
Skylark	<i>Alauda arvensis</i>														1						1		1		
Starling	<i>Sturnus vulgaris</i>			1																					
Stonechat	<i>Saxicola rubicola</i>																						4		
Swallow	<i>Hirundo rustica</i>			1					1																1

Section 3

SSE Generation
First Year Ornithological Surveys – Inchamore / Gortyrhilly
Wind Farm Summer 2017 and Winter 2017/18

Common Name	Scientific Name	Early			Late			Early			Late			Early			Late			Early			Late														
		1N									2N									3N									4N								
		0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F												
Willow Warbler	<i>Phylloscopus trochilus</i>		1		1	1			1						2						2	1			2	1											
Wood Pigeon	<i>Columba palumbus</i>																	6																			
Wren	<i>Troglodytes troglodytes</i>	1			3	2			4			2	1		3	2			5				1			1											
Total number of species	22																																				

Table 3-7: Results of breeding bird transects surveys a Gortyrhilly during Summer 2017.

Common Name	Scientific Name	Early			Late			Early			Late			Early			Late			Early			Late														
		1S									2S									3S									4S								
		0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F												
Blackbird	<i>Turdus merula</i>		3						1																												
Blackcap	<i>Sylvia atricapilla</i>									1			2						3																		
Blue Tit	<i>Cyanistes caeruleus</i>													1																							
Bullfinch	<i>Pyrrhula pyrrhula</i>				4					2																											
Chaffinch	<i>Fringilla coelebs</i>	3	1		2	1			6	2		3	2		1			6			2	2	2	3	4												
Chiffchaff	<i>Phylloscopus collybita</i>								2	1			1											3													
Coal Tit	<i>Parus ater</i>								1		1				3					1			2														
Dunnock	<i>Prunella modularis</i>	1													1			1				1															
Goldcrest	<i>Regulus regulus</i>				1				5	1		4						1			1			7													

Section 3

SSE Generation
First Year Ornithological Surveys – Inchamore / Gortyrähilly
Wind Farm Summer 2017 and Winter 2017/18

Common Name	Scientific Name	Early			Late			Early			Late			Early			Late								
		1S						2S						3S						4S					
		0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F	0-25m	25-100m	>100/F			
Goldfinch	<i>Carduelis carduelis</i>				4																				
Great Tit	<i>Parus major</i>														1										
Grasshopper Warbler	<i>Locustella naevia</i>													1											
Grey Wagtail	<i>Motacilla cinerea</i>							2																	
Hooded Crow	<i>Corvus cornix</i>			1											3			1	1		2	1			
Jay	<i>Garrulus glandarius</i>																					1			
Long-Tailed Tit	<i>Aegithalos caudatus</i>				9			1		10					3							5			
Magpie	<i>Pica pica</i>	4	2		6											1		9	1			1			
Meadow Pipit	<i>Anthus pratensis</i>														6		1					1			
Raven	<i>Corvus corax</i>																				4				
Robin	<i>Erithacus rubecula</i>	5			4			1		1					2	2		1							
Rook	<i>Corvus frugilegus</i>															1									
Siskin	<i>Spinus spinus</i>				10																				
Skylark	<i>Alauda arvensis</i>																					1			
Stonechat	<i>Saxicola rubicola</i>														2										
Swallow	<i>Hirundo rustica</i>						2		1							2						2			
Willow Warbler	<i>Phylloscopus trochilus</i>	12	5		2				1		1	2			1	7		5	2			1			
Wood Pigeon	<i>Columba palumbus</i>			1						1									11						
Wren	<i>Troglodytes troglodytes</i>	1	3		7	1									1	3		9	4	1	1				
Total number of species	28																								

4. DISCUSSION

FT has been carrying out annual ornithological surveys at the proposed Inchamore – Gortyrally Wind Farm over a one-year period between April 2017 and March 2018, inclusive. Surveys completed during this time include; Vantage Point Surveys (Breeding and Non-Breeding Season), Breeding & Winter Bird Transect Surveys, Hinterland Surveys, Breeding Moorland and Merlin surveys. Vantage point surveys were completed in accordance with the Scottish Natural Heritage Methodology for Diurnal Raptors on onshore wind farms (SNH, 2014), Hinterland surveys were undertaken following methodology by Bibby *et al.*, (2000), Breeding birds were surveyed using methodology of the breeding wader survey and breeding moorland survey, following Bibby *et al.*, (2000) and Gilbert *et al.*, (1998). Specific Merlin Survey transects carried out also following methods by Gilbert *et al.*, (1998).

4.1.1 Inchamore

Winter survey 2017/18

Inchamore, during winter surveys, noted species included Golden Plover, Snipe, White-tailed Eagle, Hen Harrier, Woodcock, Sparrowhawk, Kestrel and Teal. There were six observations of Hen Harrier over the winter period at Inchamore. Most observations consisted of males and ringtails hunting and commuting within or surrounding the site. There was no evidence of Hen Harrier Roosting or breeding within the site. It is considered likely that the Hen Harrier in question are breeding within the Musheramore Mountains SPA (Site Code: 004162) located approximately 2.95km north east of Inchamore. Hen Harrier utilise young conifer plantation for nesting with a window of between 2 and 10 years following planting offering potential nesting habitat. Once the canopy becomes enclosed it is not suitable for nest Hen Harrier. The mature forestry within the site currently is of low value for the species.

The majority of Golden Plover sightings were noted within and near the Inchamore site. Flocks of Golden Plover were flushed from the heath surrounding the VPs 1 and 2 while travelling to VP1 on two occasions in January and once in November and the species was observed landing in the heath during VPs watches at VP 1, 3 and 4. Flock sizes observed range from 40 to 1. The species is occasional roosting within the heath inside the site during the winter period. Golden plovers have been recorded in low numbers as collision fatalities at wind farms (Hotker *et al.*, 2006) (Grunkorn, 2011); the published avoidance rate by SNH for collision risk modelling for the species is 98% (SNH, 2010) indicating a high micro avoidance rate in regard to collision with turbines. A study in the Netherlands of three operational wind arms where golden plovers were active both diurnally and nocturnally found no fatalities, supporting a high micro-avoidance rate (Krijgsveld *et al.*, 2009).

White-tailed Eagle was noted on one occasion at Inchamore over the survey period on the 22nd of January 2018 from VP1. The single Eagle was only within the 500m buffer from turbine for 10 seconds. This individual is thought to be one of a pair nesting near Grousemount. Observations are infrequent within Inchamore of passage through the area.

There was one observation of Chough within the Inchamore Wind Farm site during survey in 2017/18. This observation was noted in November 2017 at VP 4 and the species is not a regular visitor to the site.

Red Grouse observations and evidence were noted within the Inchamore area, particularly at VPs 2 and 4. The species is breeding in the peatland area surrounding VP 4. Peatland within the site area of value for foraging Red Grouse.

Summer 2017

Inchamore was the quieter of the two sites during the summer 2017 season with only small amounts of activity noted during surveys within this area. Activity in Inchamore mainly consisted of Kestrel and Sparrowhawk foraging around the site. One observation of Cormorant was noted during summer and winter vantage point surveys at Inchamore. This observation was noted as being inside the site, at VP3, and noted the flight of three individuals flying westwards. The species was commuting over the area and the site is of little value to the species. Field signs of Merlin recorded within the site during the Merlin survey indicate that the species is utilising the area. Merlin nesting sites in Ireland are often old disused corvid nests in conifer plantations on the edge of heath / bog habitat habitats which are present within the study area. However, no nests were recorded during the Merlin surveys.

Peregrine falcon was observed on one occasion during the summer within Inchamore. The site is of very low value to nesting Peregrine. Grey wagtail and Mallard were also observed within the site two species associated with waterbodies and waterways.

4.1.2 Gortyrhilly

Winter survey 2017/18

The Gortyrhilly site had greater activity of the two during this period but no evidence of breeding activity for any of the main species, White-tailed Eagles, Hen Harrier and Peregrine, etc. White-tailed Eagle was observed on three occasions in Gortyrhilly during the winter survey period. All of these observations were taken at VP 5, two of the three were identified as inside the site. The species is not roosting in the site they are nesting near the Grousemount site to the west. This site is closer to the Grousemount site than Inchamore and therefore would be expected to have more incidental observations of the species. Snipe was observed numerous times throughout the winter period in Gortyrhilly and potential roosting habitat is available within the site. Most of these observations were flushed from the site, the typical flight height noted was between 0-20 metres. Two curlew observations were noted during this period, these were noted at VP5. Peatland habitats offer some potential roosting site, but little was observed. The majority of observations were flushed from the site and so recorded at low flight heights, most of these observations were outside of the site.

Merlin are considered to be breeding within the Gortyrhilly site. One Merlin observation was noted during winter surveys in Gortyrhilly. This observation of a female was identified as being within the site and at a flight height of between 0-20m.

Kestrel was most commonly observed target species travelling both within and outside of the site during this survey period, a number of these flightlines occurred at between 80-150m in height. Hen Harrier was largely noted during February and March of 2018, during this survey period, flight lines of the species typically stayed between 0-20m and mainly consisted of males. These observations are of single males hunting throughout the territories and no roosting was noted within the site. Golden Plover were observed across the site during this period with varying levels of flight height and duration observed. Birds during this time were either observed traveling or feeding within the site. Mallard were observed on two occasions during this period with flight heights of between 0-20m.

Chough were observed at VPs 7,8 and 9 within the site, an equal proportion of the species were noted both within and outside of the site, many of the flight height observations during this period were greater than 40 metres. The majority of Sparrowhawk observations were noted at heights between 0-20m, outside of the site. There are historic records which indicates that Chough were breeding in the Ballingearry area in 1992 (Berrow *et al*, 1993). The species were recorded as breeding within the 10km square W16 south of the Gortyrhilly Wind Farm site during the most recent breeding bird atlas (Balmar *et al*, 2013). Chough are predominantly a coastal species breeding in large nesting site in sea cliffs and headlands. However, a small portion of the population are known to breeding in nesting sites further inland utilising disused building and farm buildings. The species recorded during surveys within the wind farm site are considered to be post-breeding Chough passing through the area temporarily and Chough are not considered to be breeding within either site.

Summer 2017

Lesser-Black-backed Gulls were observed primarily at vantage point number 6 during summer vantage point surveys at Gortyrhilly. Two observations made during this survey were noted as being within the site, one was noted both inside and outside the site. Flight heights ranged between 20-80m during this period. The three Sparrowhawk observations during this period were primarily between 40->150m in height and were mainly outside of the site. Kestrel observations during this period typically stayed at between 40-80m in height and within the site. Most of these observations were noted at VP 6. Snipe area also potentially breeding in the site.

5. REFERENCES

- Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. (2013). *Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland*. Thetford : BTO Books, 2013.
- Band, W., Madders, M., Whitfield, D.P. (2007). *Developing Field and Analytical Methods to Assess Avian Collision Risk at Wind Farms*. Janss,G.F.E., Ferrer,M. (Editors) De Lucas. Birds and Wind Farms: Risk Assessment and Mitigation. Madrid : Quercus, 2007.
- Barton, C., Pollock, C., Norriss, D.W., Nagle, T., Oliver, G.A. & Newton, S. (2006). *The second national survey of breeding hen harriers Circus cyaneus in Ireland 2005*. Irish Birds 8: 1-20.
- Berrow, S.D., Mackie, K.L., IO' Sullivan, O., Shepherd, K.B., Mellon, C. and Coveney, J. A. (1993). *The second International Chough Survey in Ireland, 1992*. Irish Birds 5: 1-10.
- Bibby, C. J., Burgess, N. D., Hill, D. A. & Mustoe, S. H. (2000). *Bird census techniques (second edition)*. Academic Press, London.
- British Trust for Ornithology. <http://www.bto.org/volunteer-surveys/bbs/research-conservation/methodology> . www.bto.org . [Online] Accessed on the November 2018.
- Fossitt, J., 2000. *A Guide To habitats In Ireland*. The Heritage Council. Dublin.
- Gilbert, G., Gibbons, D.W. & Evans, J., 1998. *Bird Monitoring Methods – a manual of techniques for key UK species*. RSPB, Sandy.
- Grunkorn, T. (2011). *Proceedings: Conference on wind energy and wildlife impacts, 2-5 May 2011, Trondheim,Norway*. Trondheim : NINA.
- Hotker, H., Thompson, K.H., Jeromin, H. (2006). *Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats- facts, gaps in knowledge, demands for further research, andornithological guidelines for the development of renewable energy exploitation*. Bergenhusen: Michael-Otto-Institut im NABU, 2006.
- Krijgsveld, K.L., Akershoek, K., Schenk, F., Dijk, F., Dirkson, S. (2009). Collision risk of birds with modern large wind turbines. 3, s.l.: Ardea, 2009, Vol. 97.
- Ruddock, M. & Dunlop, B.J., O'Toole, L., Mee, A., Nagle, T. (2012) *Republic of Ireland National Hen Harrier Survey 2010*. Irish Wildlife Manual, No. 59. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). *The 2015 National Survey of Breeding Hen Harrier in Ireland*. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.
- Scottish National Heritage (2009)
- Scottish Natural Heritage, (2010). Avoidance Rate Information and Guidance Note. Use of avoidance rates in the SNH wind farm collision risk model, September 2010. Scottish Natural Heritage, UK.
- Scottish Natural Heritage, (2014). *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Scottish Natural Heritage.

Appendix 1

VP Summer 2017 - Survey Details



Date	VP no.	Start Time	Duration (Hrs)	Precipitation	Cloud (okta)	Wind	Visibility
25/04/2017	1	10.15	3	Dry	4/8	F 5-6 NW	Excellent-Good (some heat shimmer)
25/04/2017	1	13.45	3	some snow & hail showers	7/8	NW F6-7	V.good-good-excellent (some heat shimmer)
18/05/2017	1	10.4	3	Light rain at start, mainly dry & clear	5/8-7/8	F4-5 W	Moderate - excellent
26/05/2017	1	15.08	0.5	Dry	8/8	F6-7 SE	Moderate
29/05/2017	1	15.12	2	Dry	8/8	F3-4 SSW	V.good
03/07/2017	1	10.26	3	Misty drizzle	7/8	F3-4 SW	Excellent-poor
03/07/2017	1	13.36	3	Misty drizzle	8/8	F3-5 SW	Moderate
31/07/2017	1	10.35	3	Occasional showers; mainly dry	7/8-6/8	F6-7 WSW	Good-excellent
31/07/2017	1	13.35	3	Occasional showers	6/8-8/8	F6-7 WSW	Excellent-moderate
29/08/2017	1	10.3	3	dry	8/8	F2-3 W	Good-moderate
29/08/2017	1	13.3	3	Occasional short showers	7/8-5/8	F3-4 W	Excellent
08/09/2017	1	10.35	3	Occasional short showers	7/8-5/8-8/8	F3-5 W	V.good- moderate
08/09/2017	1	13.45	3	Occ. Brief heavy showers	7/8-6/8	F3-5 W	V.good- poor
21/04/2017	2	10	3	Dry	1/8-5/8	F4-5 NW	Ex. -V.good; some heat shimmer
21/04/2017	2	13.3	3	Dry	3/8-5/8	F3-5 NW	V.good; some heat shimmer
18/05/2017	2	13.5	3	Intermittent showers + dry spells	6/8	F3 -4 NW	Ex./mod/poor
26/05/2017	2	11.57	3	Dry	8/8-7/8	F6-7 ESE	Mod-Good; slight haze
28/06/2017	2	9.45	3	Dry	5/8	F2-3 NW	Excellent
28/06/2017	2	13.05	3	Dry	7/8-5/8	F2-5 SW	Excellent
31/07/2017	2	10.35	3	Showers	7/8	F5 SW	Good
30/08/2017	2	9.5	3	Light drizzle at end of watch	7/8-5/8	F1-4 (variable) NW	V.good
30/08/2017	2	12.5	3	Intermittent misty showers	8/8-5/8	F2-4 WNW	Mod-V.good
11/09/2017	2	11.4	3	Frequent showers	6/8-8/8	F6 W	Good-poor
11/09/2017	2	14.4	3	Frequent showers	6/8	F4-5 W	Mod-poor
20/04/2017	3	11.3	3	Dry	5/8-6/8	F2-3 Var.	Excellent

Date	VP no.	Start Time	Duration (Hrs)	Precipitation	Cloud (okta)	Wind	Visibility
20/04/2017	3	15	3	Dry	7/8	F3-4 NW	Excellent
15/05/2017	3	10.04	3	Regular misty drizzle/light showers & dry spells	8/8	F4-5 ENE	Moderate/poor
15/05/2017	3	13.34	3	Occasional showers, misty drizzle & dry clear spells	8/8	F4-5 ENE	Moderate/poor
16/06/2017	3	11.51	3	Dry	3/8	F5 NW	Excellent
16/06/2017	3	15.15	3	Dry	3/8-5/8	Var; F0-F5 NW	Excellent
04/08/2017	3	10.15	3	Medium 20 min shower in last hr of survey	7/8	F1-3 NW/N	V.good
04/08/2017	3	13.45	3	Light spitting on & off for 1st 30 min	8/8-7/8	F1-2 N/NW	V.good
18/08/2017	3	9.25	3	Occ. Showers	7/8-5/8	F4-5 WSW	Good-V.good
18/08/2017	3	12.55	3	showers & dry clear spells	8/8	F3-5 (var./gusty) W	V-good-mod
05/09/2017	3	9.3	3	Dry	6/8-2/8	F3-4 W	V.good
05/09/2017	3	12.3	3	Dry	3/8	F4-5W	Excellent
26/04/2017	4	9.3	3	Dry	4/8-8/8	NNE F5-6	Excellent
26/04/2017	4	13	3	Dry	7/8	NNE F5-6	V.good
29/05/2017	4	8.04	3	Dry	8/8	F0-2/3 SE (intermittent light air/dead calm periods)	Good-mod-Ex.
29/05/2017	4	11.34	3	Dry	8/8	F0/F1-2 S/W (calm periods & intermittent light air)	Good
19/06/2017	4	10.45	3	Dry	4/8-6/8	F3-5 SE	Excellent; some heat shimmer
19/06/2017	4	14.15	3	Dry	4/8-7/8	F3-5 SE	Excellent; some heat shimmer
03/08/2017	4	10.3	3	Light drizzle on & off for last 30 min	8/8-5/8	F3 SW	V.good
03/08/2017	4	14	3	Spitting on & off for 1st 20 mins	8/8	F4 SW	Excellent
31/08/2017	4	10.12	3	Heavy shower for last 10 mins	8/8-4/8	F2-3 W	V.good
31/08/2017	4	13.45	3	Rained prior to survey	8/8-6/8	F2-3 W	V.good

Date	VP no.	Start Time	Duration (Hrs)	Precipitation	Cloud (okta)	Wind	Visibility
11/09/2017	4	11.3	3	Showers occasional	8/8-5/8	F2	Good
10/05/2017	5	10.45	3	Dry	5/8	F1-2 E	V.good
09/05/2017	6	8	3	Dry	0/8	F1-O E	V.good
09/05/2017	6	12	3	Dry	4/8- 2/8	F2 E	V.good
28/05/2017	9	09:30	3	N/A	2/8	F2-3 SW-SE	Excellent
01/07/2017	9	10:00	3	N/A	8/8	V.Calm, little to no wind <F1	Good
01/07/2017	8	13:15	3	N/A	8/8	F<1 SW	Good
30/06/2017	9	10:00	3	N/A	4/8	F5-6 NW occ. Galeforce	Excellent
30/06/2017	8	13:30	3	N/A	3/8	F6 NW V.windy	Excellent
24/07/2017	9	09:30	3	N/A	1/8	F3-4 NNW	Excellent
29/07/2017	8	13:30	3	occasional light rain	8/8	F2-3 SW	Excellent
24/07/2017	8	13:00	3	N/A	2/8	F4-5 NNW	Excellent
29/07/2017	9	10:00	3	N/A	7/8	F2-3 SW	Excellent
28/04/2017	8	13	3	Occasional showers	2/8	F3-4 SW	Excellent
28/04/2017	9	09:30	3	Misty	8/8	F3-4 SW	Good
29/04/2017	9	09:30	3	Spells	8/8	F3-4 SW	Okay
28/08/2017	9	12:00	3	Rain at 15:00	8/8	F1-2 SW	Good
26/08/2017	9	13:30	3	N/A	8/8	F1-2 S	Excellent
27/08/2017	8	09:30	3	N/A	Dense fog, lifting occasionally	SSW veeryibf around to SE F1-2	Poor
26/08/2017	8	10:00	3	occasional light drizzle	8/8	S F1-2	Excellent
28/05/2017	8	13:00	3	N/A	2/8	F3-4 SE	Excellent
29/05/2017	9	09:30	3	N/A	8/8	F<1 SSE	Excellent
29/05/2017	8	13:00	3	N/A	8/8	F<1 veering SSE SSW F1-2	Excellent

Date	VP no.	Start Time	Duration (Hrs)	Precipitation	Cloud (okta)	Wind	Visibility
09/05/2017	7	07:40	3	Dry	0/8	F2-0 E	V. good
09/05/2017	6	08:00	3	Dry	0/8	F1-0 E	V. good
09/05/2017	6	12:00	3	Dry	4/8-2-8	F2 E	V. good
09/05/2017	7	11:40	3	Dry	5/8-4/8	F2 E	good + v.good
28/09/2017	9	09:30	3	Frequent squalls	8/8	SE F4-5 occ. 5-6	Excellent to Good
28/09/2017	8	13:00	3	Continuous Rain	8/8	SE 5-6	Good to Poor
23/09/2017	8	12:30	3	Occasional Drizzle	8/8	SSW F4-5	Good
30/06/2017	7	13:00	6	N/A	4/8	N F4-5	Good
29/07/2017	7	13:00	3	N/a	6/8	F 1	Good
28/07/2017	7	10:00	3	Light rain, mist	8/8	F 2	poor
26/08/2017	7	09:30	3	none	6/8	F0	Good
25/08/2017	7	13:15	3	N/A	7/8	F0	Good (poor between 14:15 and 14:50 due to mist)
17/09/2017	7	08:50	3	N/A	0/8	F0	Good
16/09/2017	7	11:50	3	N/A	8/8	F3	Good
29/06/2017	6	08:30	3.5	low cloud in am	8/8	NW F3	moderate
29/06/2017	6	11:30	3.5	low cloud in am	8/8	NW F3	moderate
29/07/2017	6	09:30	3	N/A	6/8	F2	Good
28/07/2017	6	13:30	3	N/A	6/8	F2	moderate
27/08/2017	6	09:15	2.25	N/A	8/8	F0	Poor then good
26/08/2017	6	13:00	4	N/A	8/8	F0	Good
17/09/2017	6	12:20	3	N/A	5/8	F0	Good
15/09/2017	6	11:00	2	N/A	4/8	F2	Good
15/09/2017	6	13:00	1	N/A	4/8	F2	Good
30/06/2017	5	08:30	3	N/a	4/8	N F4-5	Good
27/07/2017	5	11:30	3	Light shower in pm	4/8	F3-4 SW	Good
25/08/2017	5	08:30	4	N/A	7/8	F0	Good

Date	VP no.	Start Time	Duration (Hrs)	Precipitation	Cloud (okta)	Wind	Visibility
24/08/2017	5	16:20	2	N/A	7/8	F2	Good
16/09/2017	5	08:30	3	N/A	7/8	F1	Good
16/09/2017	5	08:30	3	N/A	7/8	F1	Good
15/09/2017	5	15:00	3	Showers	3/8	F3	Good
01/07/2017	5	11:00	3	Mist	8/8	NW F2	Moderate to poor
25/09/2017	9	09:30	3	N/A	8/8	F4-5 SE	Excellent-Good
01/06/2017	7	10:30	3	Showers, mist	8/8	F 1	Poor in showers - moderate
02/06/2017	5	10:00	3	Light showers	5/8	F 2/3	Good
02/06/2017	5	13:30	3	Light showers	5/8	F 2/3	Good
03/06/2017	6	13:30	3	Showers	6/8	F 3	Good

Appendix 2

VP Winter 2017/2018 - Survey Details



VP Winter 2017/2018 - Survey Details

Date	VP	Time	Duration (hours)	Precipitation	Cloud (okta)	Wind	Visibility
22/12/2017	1	10:15	3	Some misty drizzle	8/8-7/8	F2-4 SW	V.good-Mod
22/12/2017	1	13:15	3	Dry	8/8	F3-4 SW	V.good
31/12/2017	2	13:40	3	Frequent Showers	8/8	F3-4 SW	Fair-Good
31/12/2017	4	09:30	3.5	Heavy rain	8/8	F3-4 SW	Poor-Good
11/09/2017	4	11:30	3	Occasional showers	8/8-5/8	F2	Good
23/09/2017	8	12:30	3	-	8/8	F4-5 SSW	Good
28/09/2017	8	13:00	3	Rain	8/8	F5-6 SW	Good-Poor
24/10/2017	8	13:30	3	Drizzle	8/8	F3 SW	Good-Poor
24/10/2017	9	10:00	3	Drizzle	8/8	F3-4 SW	Excellent
25/10/2017	3	10:00	3	Light spitting for 15 min	8/8	F0	V.Good
25/10/2017	3	13:30	3	Dry	8/8	F0	V.Good
26/10/2017	7	11:30	3	early mist	8/8	0	Poor then good
26/10/2017	7	15:30	3	early mist	8/8	0	Poor then good
26/10/2017	8	13:30	2	Occasional drizzle	8/8	F1 SW	Poor
26/10/2017	9	10:00	3	Occasional drizzle	8/8	F1 SW	Poor-Fair
27/10/2017	2	09:30	6		8/8	F1 SW	Poor-Good
27/10/2017	5	08:30	3.5	late mist	8/8	0	Poor then moderate
28/10/2017	6	08:30	3.5	late mist	8/8	0	moderate
05/11/2017	4	10:00	6	Light Showers	4/8	F2 WSW/W	Good/ Glare at times
15/11/2017	2	11:4	3	Occ. Misty showers; 90% dry	8/8-7/8	F3 WSW	Mod-V.good
15/11/2017	2	14:4	2	Some misty showers	8/8	F3-4 WSW	V.good-poor
15/11/2017	3	11:00	3	Drizzle	8/8	F2 ENE	-
15/11/2017	3	14:30	3	None	7/8	F3 S	Excellent
16/11/2017	7	10:30	3	None	4/8	F2 NNW	Excellent
16/11/2017	7	14:00	3	None	4/8	F3 NNW	Excellent
16/11/2017	8	13:00	3	-	2/8	F1-2 NNE	Excellent
16/11/2017	9	09:30	3	-	3/8	F1-2 NNE	Excellent
17/11/2017	6	09:30	3	None	5/8	F0	Excellent
17/11/2017	6	13:00	3	Light showers	7/8	F1-2	Good
23/11/2017	1	10:30	3	Dry	4/8	F4-5 NW	V.good
23/11/2017	1	13:30	3	Dry	8/8	F3-4 NW	V.good
23/11/2017	2	09:35	1	Dry	4/8	F5-6 NW	Good

Date	VP	Time	Duration (hours)	Precipitation	Cloud (okta)	Wind	Visibility
23/11/2017	8	09:30	3	-	2/8	F2-3WNW	Excellent
23/11/2017	9	12:40	3	-	8/8	F1 WNW	Excellent
30/11/2017	1	10:30	6	N/A	6/8	F4 NNW-S	Good
30/11/2017	4	09:30	3	Dry	7/8	F2-3 NNW	Good; distant patches of fog
30/11/2017	4	13:00	3	Dry	7/8	F2-3 NNW	Good; distant patches of fog
01/12/2017	3	9:45	3	Dry	1/8-3/8	F0-1 NW	V.good
01/12/2017	3	12:45	3	Dry	2/8	F0-1 NW	V.good
05/12/2017	7	8:30	3	Dry	8/8	F2-3 S	Good
05/12/2017	7	12:00	4	-	8/8	F3-4 S	Moderate- good
11/12/2017	8	9:45	3	None	3/8	F3 NNW	Excellent
11/12/2017	8	13:15	3	None	4/8	F3-4	Excellent
11/12/2017	9	09:20	3	Dry	5/8	F4-6N	Excellent
11/12/2017	9	12:40	3	Dry	5/8	F5-6N	Excellent
15/12/2017	1	10:00	3	Dry	1/8-4/8	F5-6 NW	Good-Ex
15/12/2017	1	13:00	3	Dry	4/8	F5-6 NW	Excellent
15/12/2017	6	10:00	3	Dry	1/8-4/8	F2-3 N & N/W	Very good
15/12/2017	6	13:25	3	-	2/8-4/8	F3 NW	Very good
18/12/2017	4	9:30	3	Dry	5/8	F1 S	Moderate
30/12/2017	5	09:30	3	None	8/8	F5-6 SW	Good
31/12/2017	2	13:40	3	frequent squalls	8/8	SW F3-4	Fair-Good
31/12/2017	4	09:30	4	Frequent Heavy	8/8	SW F3-4	Poor to Good
01/01/2018	2	09:30	3	Heavy showers at first	8/8	W-NW F5-6	Good
01/01/2018	5	12:45	3	Occasional showers	6/8	F5-6 W-NW	Good
04/01/2018	3	10:30	3	Occ. Light showers	7/8	F4-5 W	Good
04/01/2018	3	13:30	3.5	Occ. Light showers	7/8	F3-4 W	Good
11/01/2018	7	09:45	3	None	3/8	F1 SSE	Good; small patches of fog in low pockets; cleared after 2 hrs
11/01/2018	7	13:15	3	None	4/8	F1 SSE	Excellent
11/01/2018	9	10:50	3	Dry	1/8-5/8	F1 SSW	Excellent
11/01/2018	9	13:50	3	Dry	5/8	F2 SW	Ex-mod
19/01/2018	2	12:30	3	Heavy snow showers	7/8	F4 W	Moderate

Date	VP	Time	Duration (hours)	Precipitation	Cloud (okta)	Wind	Visibility
19/01/2018	8	9:00	2	-	5/8	F3-4 W	Good
22/01/2018	4	11:50	3	Dry	8/8	F3-4 W	Good
26/01/2018	2	09:00	3	Occ. showers	6/8	F3	Good
26/01/2018	4	12:30	2	Dry	8/8	F2-3 WSW	Good
02/02/2018	5	10:00	3	Dry	7/8-8/8	NW F2	Excellent
02/02/2018	5	13:00	3	Light rain at end of watch	8/8	NW F2	Ex.-good
02/02/2018	6	08:00	3	Dry	7/8	F3	Excellent
02/02/2018	6	11:30	3	Dry	7/8	F2	Excellent
08/02/2018	3	08:30	3	Drizzle	8/8	F1	Poor-mod
08/02/2018	3	12:00	3	Dry	7/8	F2	Mod-good
09/02/2018	2	11:05	3	1 brief snow shower	5/8	F2 NW	V.good-poor-v.good
09/02/2018	2	14:05	3	Dry	8/8	F3 NW	V.Good
13/02/2018	8	10:30	3	some light snow	4/8	F1-2 NW	V.good
15/02/2018	4	10.45	3	Some light snow	5/8-8/8-6/8	F4-5 W	V.good/mod
15/02/2018	4	14:00	3	Regular light snow	4/8-8/8	F4 W	V.good-mod
21/02/2018	7	09:5:	3	Dry	8/8-6/8	F2-3 SE	Good-mod-ex.
21/02/2018	7	13:00	3	Dry	5/8	F2-3 SE	Excellent
21/02/2018	9	8:30	2	Dry	1/8	F1	Excellent
21/02/2018	9	12:00	3	Dry	7/8	F1	Good
22/02/2018	5	10:30	6.5	-	8/8	F 2-4 SW	Excellent to Good
22/02/2018	8	09:00	3	Dry	-	F2-4 SW	Good
22/02/2018	8	12:30	3	Dry	-	F4	Good
13/03/2018	8	11:20	3	Occ. Light showers	8/8	F4-5 S	V. good/Mod
13/03/2018	8	14:20	3	Occ. Light showers increasing towards end	8/8	F5 S occ 6	good-mod-poor
23/03/2018	2	12:20	3	Light showers	8/8	F3 SE	Moderate/Occ. Poor
23/03/2018	2	15:30	3	Steady light rain	8/8	F3 ESE	Mod
27/03/2018	6	10:00	6	-	6/8	F2-4 NW	Excellent/Occ. Mod
27/03/2018	9	11:25	3	Light showers	-	F2 SE	Excellent
27/03/2018	9	15:01	3	V light shower	-	F 2 SE	Excellent
04/04/2018	4	13:45	6	N/A	6/8	F4	Good
05/04/2018	5	09:35	3	None	6/8	F1	V. good
05/04/2018	5	13:10	3	N/A	6/8	F1	Vgood
08/04/2018	1	12:15	6	N/A	Fog 4/8	F3	Good/ Fog
09/04/2018	3	09:50	3	Dry	6/8-8/8	F2 SE	Excellent
09/04/2018	3	12:50	3	Dry	8/8	F2/3 SE	Excellent

Date	VP	Time	Duration (hours)	Precipitation	Cloud (okta)	Wind	Visibility
20/04/2018	6	10:30	6		2/8 -8/8	-	Excellent
20/04/2018	7	10:30	3	Dry	4/8	F2-3 W-NW	Excellent
20/04/2018	7	13:45	3	Dry	4/8	F2 W F0 Var	Excellent
28/04/2018	4	09:30	3	Showers	4/8	F1	Good
29/04/2018	1	07:45	6	N/A	3/8	F4	Good
28/11/2017	5	10:00	0.5	Dry	-	N F6- 7	Excellent
28/11/2017	5	10:30	3	Dry	1/8-6/8	N F6- 7	Excellent
28/11/2017	5	13:30	3	One brief hail shower	6/8	N F5- 6	Excellent- moderate

Appendix 3

Bird Survey Observations



Table 1: Gortyrally Summer 2017 Vantage Point Observations

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
5	16/09/2017	08:30	11:30	Buzzard	-	1	10.25	in	80					80	Bird flew west – east across site, first time seen on site
6	09/05/2017	08:00	11:00	Kestrel_K.	7	1	08:16	in	67	33	34				
6	09/05/2017	08:00	11:00	Kestrel_K.	-										
6	29/06/2017	11:30	15:00	Kestrel_K.	1	1	12.1	in	90						
6	28/07/2017	13:30	16:30	Kestrel_K.	2	1	15.45	in	180				160		Hovering / Hunting
6	28/07/2017	13:30	16:30	Kestrel_K.	3	1	15.55	in	120			120			Hovering / Hunting
6	28/07/2017	13:30	16:30	Kestrel_K.	-	1	16	in	50				50		Hovering / Hunting

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
7	29/07/2017	13:00	16:00	Kestrel_K.	4	1	13.5	in	20			20			Hovering
7	29/07/2017	13:00	16:00	Kestrel_K.	-	1	15.15	in	20					20	
7	29/07/2017	13:00	16:00	Kestrel_K.	-	1	15.2	in	90			90			Hovering
6	15/09/2017	11:00	13:00	Kestrel_K.	5	1	12.3	in	100			50	20		
6	15/09/2017	11:00	13:00	Kestrel_K.	-	1	12.35	in	60			60			
6	15/09/2017	11:00	13:00	Kestrel_K.	-	1	12.45	in	45			10	35		
6	15/09/2017	11:00	13:00	Kestrel_K.	-	1	12.5	in	260				260		

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
6	15/09/2017	11:00	13:00	Kestrel_K.	-	1	13	in	20				20		
6	15/09/2017	11:00	13:00	Kestrel_K.	-	1	13.1	in	30				30		
6	17/09/2017	12:20	15:30	Kestrel_K.	6	1	12.3	in	20					20	Hovering
6	17/09/2017	12:20	15:30	Kestrel_K.	-	1	12.55	in	160				160		
6	17/09/2017	12:20	15:30	Kestrel_K.	-	2	13	in	40				40		
6	17/09/2017	12:20	15:30	Kestrel_K.	-	1	13.1	in	40				40		
6	17/09/2017	12:20	15:30	Kestrel_K.	-	1	13.25	in	25			25			Kestrel aggressively mobbed by Ravens

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
6	17/09/2017	12:20	15:30	Kestrel_K.	-	1	13.4	out	120					120	
6	03/06/2017	10:00	13:00	Kestrel_K.	-	2	10:01	Out	5	5					
6	03/06/2017	13:30	16:30	Kestrel_K.	-	1		Out							
6	03/06/2017	13:30	16:30	Kestrel_K.	-	1		Out							
7	29/07/2017	13:00	16:00	Kestrel_K.	-	2	14.35	in	40			40			2 separate birds hunting
6	29/07/2017	09:30	12:30	kestrel_K.	-	1	11:20	In	40				40		Hovering
6	15/09/2017	13:00	14:05	Kestrel_K.	-	1	13:10	out	30				30		

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
6	09/05/2017	08:00	11:00	Snipe_SN	1	1	08:42	out	N/A						heard only
6	09/05/2017	08:00	11:00	Snipe_SN	2	1	10:31	out	5	5					Landed in rushy field.
6	09/05/2017	08:00	11:00	Snipe_SN	-										
6	03/06/2017	10:00	13:00	Sparrowhawk_SH	-										
6	29/07/2017	09:30	12:30	Sparrowhawk_SH	-	1	10:10	In	3	3					Flew from path
5	15/09/2017	15:00	18:00	Sparrowhawk_SH	-	1	15:55	In	3	3					Flew from hedge
6	17/09/2017	12:20	15:30	Sparrowhawk_SH	1	1	13.3	out	120						Chased off by ravens

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
9	29/07/2017	10:00	13:00	Sparrpwhawk_SH	2	1	12:15	Out	75			75			Immature, mobbed by 5 swallows, c. 40m
5	27/07/2017	15:00	18:30	Whimbrel_WM	-										
5	27/07/2017	15:00	18:30	White-tailed Eagle_WD	4	2	17.55	in	900	40	40	40	780		
5	10/05/2017	10.45	13.45	White-tailed eagle_WE	2	1	11.28	OUT	36	36					Mobbed by RN
5	10/05/2017	10.45	13.45	White-tailed eagle_WE	3	1(2)	13.02	OUT	15	15					One flew up briefly, mobbed by ravens, flew down again to land in heath beside 2nd WE. Still present at end of watch. One had lighter head; other had darker head & light chest. One had orange or pink band on left wing, blue band on right wing. Roosting; may

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
															also have been feeding.
5	10/05/2017	14.05	17.05	White-tailed eagle_WE	1	1(2)	14.09	out	14	14					WE with wingbands flew off; other remained throughout watch; appeared to be feeding at first; later, roosting.

Table 3: Inchamore Summer 2017 Vantage Point Observations

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
3	18/08/2017	9.25	12.25	Cormorant_CA	-	3		IN						Flying E-W through viewshed	3
2	31/07/2017	10.35	16.35	Kestrel_K.	9	1	13.02	OUT	1800	1800					Moving along short intervals surveying field while hovering
2	31/07/2017	10.35	16.35	Kestrel_K.	9	1	13.32	IN	300	300					Crossed into viewshed & out of viewshed
2	31/07/2017	10.35	16.35	Kestrel_K.	8	2	13.44	IN	30		30				Pair travelling across viewshed, not hovering
2	31/07/2017	10.35	16.35	Kestrel_K.	7	1	14.26	IN	45	45					Travelling & stopped twice to hover briefly
2	31/07/2017	10.35	16.35	Kestrel_K.	7	1	14.26	OUT	50	50					
2	31/07/2017	10.35	16.35	Kestrel_K.	6	1	14.41	OUT	70	70					Travelling, no hovering

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
2	11/09/2017	11.4	14.4	Peregrine Falcon_PE	1	1	13:36	IN	10	10					
4	03/08/2017	10.3	13.3	Snipe_SN	-										Heard only
3	15/05/2017	13.34	16.34	Sparrowhawk_SH	1	1	14.28	IN	19	19					Female or juvenile; flying c.1m altitude, hunting along road & field boundaries. Lost sight behind spur.
3	15/05/2017	13.34	16.34	Sparrowhawk_SH	1	1	14.28	OUT	2	2					
1	29/08/2017	10.3	13.3	Sparrowhawk_SH	3	1	10.3	IN	5	5					A, B & C = same bird. Flushed on approach to VP, flew downhill behind ridge
1	29/08/2017	10.3	13.3	Sparrowhawk_SH	4	1	10.3	IN	3	3					Approached ridge, flushed again, flew behind 2nd ridge
1	29/08/2017	10.3	13.3	Sparrowhawk_SH	5	1	10.3	IN	10	10					Approached 2nd ridge, flushed, flew across heath into conifer plantation

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
3	05/09/2017	9.3	12.3	Sparrowhawk_SH	2	1	10.3	IN	7	7					Male; took small passerine from low branch of spruce tree
3	05/09/2017	9.3	12.3	Sparrowhawk_SH	2	1	10.3	OUT	3	3					

Table 2: Gortyrhilly Winter 2017 / 18 Vantage Point Observations

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
9	24/10/2017	10:00	13:00	Chough_CF	-										
7	16/11/2017	10.3	13.3	Chough_CF	6	2	11.02	IN	161				161		Min. 2 seen, but more heard calling
7	16/11/2017	10.3	13.3	Chough_CF	7	1	11.41	IN	43	43					Calling, flying
7	16/11/2017	10.3	13.3	Chough_CF	8	2	12.42	IN	20	20					Seen feeding in GA1 for 5 mins before flying a short distance
7	16/11/2017	10.3	13.3	Chough_CF	-		13.03	IN	120						Chough heard calling for approx. 2 mins but could not be located visually
7	05/12/2017	8.3	11.3	Chough_CF	-	1									Heard calling at 8.50; not seen
8	11/12/2017	9.45	12.45	Chough_CF	1	4	11.33	OUT	578			60	478	40	Min 4 seen, but more heard only

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
8	11/12/2017	13.15	16.15	Chough_CF	2	1	13.36	IN	315				40	275	
8	11/12/2017	13.15	16.15	Chough_CF	2	1	13.36	OUT	120				120		
8	11/12/2017	13.15	16.15	Chough_CF	3	1	13.48	OUT	46		46				
8	11/12/2017	13.15	16.15	Chough_CF	4	1	13.52	OUT	98		98				
8	11/12/2017	13.15	16.15	Chough_CF	5	1	14.05	OUT	182		30	30	62	60	
6	17/11/2017	9.3	12.3	Cormorant_CA	1	1	11.53	OUT	125				125		Travelling
8	13/02/2018	10.3	15.05	Cormorant_CA	-			OUT							Flew in to roost C.200m S of VP

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
5	28/11/2017	10	10.3	Curlew_CU	1	1	*	IN	5	5					*Flushed Male route to VP
5	02/02/2018	10	13:00	Curlew_CU	2	1		OUT							Heard calling
7	26/10/2017	11:30	15:00	Golden Plover_GP	-	1	11:30	IN	5		5				Bird calling not seen
7	26/10/2017	11:30	15:00	Golden Plover_GP	2	18	12:50	IN	140		80	60			Small flock feeding on moor flew up and circled for 2 minutes before landing on the moor
7	26/10/2017	15:30	18:00	Golden Plover_GP	3	11	16:15	IN	5		5				Flyover
7	26/10/2017	15:30	18:00	Golden Plover_GP	4	36	17:35	IN	3600				3600		Small flock flew around the vp changing direction rapidly in typical formation
5	27/10/2017	08:30	12:00	Golden Plover_GP	1	30	09:50	IN	10				10		Flyover

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
7	16/11/2017	14	17	Golden Plover_GP	14	6	14.42		110	3	4	3	100		Flying & calling, appeared to land in grazed HH3
9	16/11/2017	09:30	12:30	Golden Plover_GP	-										
6	17/11/2017	9.3	12.3	Golden Plover_GP	9	c.25	10.26	IN	66					66	Travelling- distantly. Picked up with scope
6	17/11/2017	9.3	12.3	Golden Plover_GP	10	c.30	10.26	IN	5					5	Travelling- distantly. Picked up with scope
6	17/11/2017	9.3	12.3	Golden Plover_GP	11	5	11.08	IN	211		20	10	181		Travelling, calling, appeared to attempt to land in PB2 but gained height and flew W; lost in cloud
6	17/11/2017	9.3	12.3	Golden Plover_GP	11	5	11.08	OUT	60				60		
6	17/11/2017			Golden Plover_GP	-		12.45	OUT							Heard calling overhead between watches

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
6	17/11/2017	13	16	Golden Plover_GP	12	4	13.12	OUT	14	4	10				Travelling, landed GA1/PB2
6	17/11/2017	13	16	Golden Plover_GP	13	4	15.02	IN	124					124	Same birds as above. Took off, called, gained height & travelled west
6	17/11/2017	13	16	Golden Plover_GP	13	4	15.02	OUT	70	5	10	10	10	35	
7	05/12/2017	8.3	11.3	Golden Plover_GP	5	1	10.42	IN	4			4			Calling; not seen
7	11/01/2018	9.45	12.45	Golden Plover_GP	6	3	11.28	IN	28				28		Calling over
7	21/02/2018	13	16	Golden Plover_GP	7	c.25	14.31	IN	499	125	349	25			Landed on heath NE of VP
7	21/02/2018	13	16	Golden Plover_GP	8	c.30	15.08	IN	130	13	91	26			

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
5	02/02/2018	13	16	Hen Harrier_HH	4	1	14.25	IN	11	11					Male
6	02/02/2018	11.3	14.3	Hen Harrier_HH	5	1	12.08	IN	30		30				Male hunting low over wet heath & young WD4 & semi-improved grassland
6	02/02/2018	11.3	14.3	Hen Harrier_HH	5	1	12.08	OUT	190	190					
9	21/02/2018	8.3	11.3	Hen Harrier_HH	1	1	09.21	IN	135	135					Ringtail hunting- lost behind hill
9	21/02/2018	8.3	11.3	Hen Harrier_HH	2	1	09.27	IN	59	59					Ringtail hunting, + mobbed by HCs - lost behind hill
9	21/02/2018	8.3	11.3	Hen Harrier_HH	3	1	09.38	IN	111	111					Ringtail hunting
8	13/03/2018	11:20	14:20	Hen Harrier_HH	9	1	12:46	IN	11	11					Male

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
8	13/03/2018	14:20	17:20	Hen Harrier_HH	10	1	15:43	IN	42	42					Male
8	13/03/2018	14:20	17:20	Hen Harrier_HH	11	1	16:05	IN	7			7			Male
8	13/03/2018	14:20	17:20	Hen Harrier_HH	11	1	16:05	OUT	28		11	17			Male
6	27/03/2018	10:00	16:15	Hen Harrier_HH	7	1	10:54	OUT	9	9					Male
6	27/03/2018	10:00	16:15	Hen Harrier_HH	8	1	10:57	OUT	11	11					Male
7	16/11/2017	10.3	13.3	Kestrel_K.	10	1	11.46	IN	322	20			176	146	Immature Hunting on edge of WD4, grazed HH3
5	28/11/2017	10.3	13.3	Kestrel_K.	5	1	12:35	IN	153	46	107				Hovering and flying; hovered 20-40m for 30 sec in area between T31 & T32

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
5	28/11/2017	10.3	13.3	Kestrel_K.	5	1	13:35	OUT	18	18					
8	11/12/2017	9.45	12.45	Kestrel_K.	6	1	12.27	OUT	269				60	209	Hunting, dropped
9	11/01/2018	13.5	16.5	Kestrel_K.	7	1	14.29	IN	7	7					
6	02/02/2018	8	11	Kestrel_K.	8	1	08.12	OUT	5	5					Seen briefly, behind tree
6	20/02/2018	10:30	17:00	Kestrel_K.	1	1	11:16	IN	32	32					Hovering
6	20/02/2018	10:30	17:00	Kestrel_K.	-	1	11:16	IN	32	32					Hunting- mobbed by passerine, Frog spawn found 8x clumps
9	21/02/2018	8.3	11.3	Kestrel_K.	3	1	11.19	IN	38		4	4	30		Hovering, hunting, lost behind trees

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
9	21/02/2018	12	15	Kestrel_K.	4	1	13.16	IN	71				71		
9	21/02/2018	12	15	Kestrel_K.	4	1	13.16	OUT	100				100		Hunting, travelling
8	22/02/2018	9	12	Kestrel_K.	2	1	11.44	IN	80				80		Travelling
8	22/02/2018	9	12	Kestrel_K.	2	1	11.44	OUT	89				89		
6	27/03/2018	10:00	16:15	Kestrel_K.	9	1	15:15	OUT	225	157	45	23			
7	20/04/2018	10:30	13:30	Kestrel_K.	-	1	11:44	IN	395	130	175	90			
6	02/02/2018	8	11	Mallard_MA	1	2	07:55	OUT	20	10	10				

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
6	20/02/2018	10:30	17:00	Mallard_MA	2	1	12:31	OUT	5	5					Flying between two
9	27/03/2018	11:25	14:25	Merlin_ML	1	1		IN	25	25					Female
6	28/10/2017	08:30	12:00	Peregrine Falcon_PE	1	1	09:15	IN	5				5		Flew SW-NE
6	28/10/2017	08:30	12:00	Peregrine Falcon_PE	1	1	09:15	OUT	5				5		
5	28/11/2017	10	10.3	Red Grouse_RG	1	1	*	IN	2	2					*Flushed on route to VP
5	28/11/2017	10	10.3	Red Grouse_RG	1	1	*	OUT	4	4					*Flushed on route to VP
5	02/02/2018	10	13	Red Grouse_RG	2	2	10.00	OUT	3	3					Flushed on approach to VP; flew off calling

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
9	21/02/2018	12	15	Red Grouse_RG	-	1	12.59	IN	5						Heard calling
8	13/03/2018	11:20	14:20	Red Grouse_RG	3	1	13:26	OUT	4	4					
5	28/11/2017	10	10.3	Snipe_SN	5	1	10:00-10:30	IN	6	6					*Flushed on route to VP
5	28/11/2017	10	10.3	Snipe_SN	5	1	10:00-10:30	OUT	6	6					*Flushed on route to VP
5	28/11/2017	10	10.3	Snipe_SN	6	1	10:00-10:30	IN	5	5					*Flushed on route to VP
5	28/11/2017	10	10.3	Snipe_SN	6	1	10:00-10:30	OUT	5	5					*Flushed on route to VP
5	28/11/2017	10.3	13.3	Snipe_SN	7	1	10:00-10:30	OUT	7	7					Flushed from heather in front of VP

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
8	11/12/2017	13.15	16.15	Snipe_SN	8	1	13.32	OUT	9	9					
6	15/12/2017	10	13	Snipe_SN	-	2		OUT							Outside site on way to VP
5	02/02/2018	13	16	Snipe_SN	-	1	16.12*	IN	9	9					*Flushed on walk out after watch
6	02/02/2018	11.3	14.3	Snipe_SN	-	2	12.09	OUT	20	15	5				Flushed by HH
6	20/02/2018	10:30	17:00	Snipe_SN	3	1	11:56	OUT	11	11					Flying far around
5	22/02/2018	10:30	17:00	Snipe_SN	1	1	10:30	IN	10	10					Flying
5	22/02/2018	10:30	17:00	Snipe_SN	2	3	12:24	IN	9	9					Flying

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
8	22/02/2018	9	12	Snipe_SN	4	2	10.18	OUT	10	10					
6	27/03/2018	10:00	16:15	Snipe_SN	12	2	09:58	OUT	4	4					
6	27/03/2018	10:00	16:15	Snipe_SN	13	1	09:58	OUT	13	13					
6	27/03/2018	10:00	16:15	Snipe_SN	11	1	16:18	OUT	3	3					
9	11/12/2017	9.2	12.2	Sparrowhawk_SH	2	1	10.57	IN	8	8					Mobbed by 2 HC
9	11/12/2017	9.2	12.2	Sparrowhawk_SH	3	1	12.02		5	5					
6	02/02/2018	11.3	14.3	Sparrowhawk_SH	4	1	13.36	OUT	61	61					

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
8	22/02/2018	12.3	15.3	Sparrowhawk_SH	1	1	12.52	OUT	18	18					Female; travelling
8	13/03/2018	11:20	14:20	Sparrowhawk_SH	5	1	13:34	OUT	4	4					
8	13/03/2018	14:20	17:20	Sparrowhawk_SH	6	1	13:35	OUT	9	9					Female
5	22/02/2018	10:30	17:00	White-tailed Eagle_WE	1	1	-	IN	30		30				White-tailed Eagle feeding on dead sheep within buffer, flew inside buffer @ 20-30m for 30 seconds before flying to W outside of buffer out of site. Flew back and circles same spot for c. 15 seconds disappeared out of view to west
5	22/02/2018	10:30	17:00	White-tailed Eagle_WE	1	1	-	OUT	15		15				
5	05/04/2018	09:35	12:35	White-tailed Eagle_WE	2	1	10:50	OUT	30					30	Hovering/commuting to the west of the site out of view

Table 4: Inchamore Winter 2017 / 18 Vantage Point Observations

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
4	05/11/2017	10:00	16:00	Chough_CF	-										
2	15/11/2017	14.4	16.55	Golden Plover_GP	11		14.4								Heard calling overhead; obscured by cloud; could tell general location & direction of flight from calls
1	23/11/2017	10.3	13.3	Golden Plover_GP	1	11	10.55	IN	15	15					Lost sight behind rise to west of VP1
1	23/11/2017	10.3	13.3	Golden Plover_GP	2	12	12.35	IN	11	11					Lost sight behind rise; appeared to be landing
1	23/11/2017	10.3	13.3	Golden Plover_GP	3	c. 35	12.56	IN	105	73	32				c. 25 followed closely by 10. Appeared to land behind rise, same area as above
1	23/11/2017	10.3	13.3	Golden Plover_GP	4	15	13.27	IN	18	18					Probably arrived earlier, + disturbed. Other GO flightpaths (1,4, & 5) considered influx from N + E

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
1	23/11/2017	10.3	13.3	Golden Plover_GP	5	c.40	13.15-13.25	IN							4 flocks of c.10 flushed& flew along FP A when area approached to confirm landing
1	23/11/2017	13.3	16.3	Golden Plover_GP	6	c.30	13.5	IN	18	18					
1	23/11/2017	13.3	16.3	Golden Plover_GP	7	16	13.54	IN	15	15					
1	23/11/2017	13.3	16.3	Golden Plover_GP	8	10	14	IN	4	4					
2	23/11/2017	9.35	10.2	Golden Plover_GP	9	4	9.48	IN	10	10					
2	23/11/2017	9.35	10.2	Golden Plover_GP	10	4	9.54	IN	18	18					
4	30/11/2017	9.3	12.3	Golden Plover_GP	12	1	9.22	IN	15	15					Flushed on way to VP from HH3/PB2

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
1	15/12/2017	13	16	Golden Plover_GP	13	10	14.52	IN	15	15					
1	15/12/2017	13	16	Golden Plover_GP	14	12	15.54	IN	13	13					
1	15/12/2017	13	16	Golden Plover_GP	15	12	15.55	IN	45	10	35				Assume same flock as (2) above; appeared to land behind rise west of VP
4	18/12/2017	9.3	12	Golden Plover_GP	16	24	11.55	IN	106					106	Calling, travelling; lost in direct sun
4	18/12/2017	9.3	12	Golden Plover_GP	-										Heard calling near VP
2	19/01/2018	12.3	15.3	Golden Plover_GP	23	1	14.21	IN					200		Calling & travelling
2	19/01/2018	12.3	15.3	Golden Plover_GP	23	1	14.21	OUT					129		

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
1	22/01/2018	10.15	13.15	Golden Plover_GP	17	1	10.12	IN	9	9					Flushed on route to VP, flew off low calling
1	22/01/2018	10.15	13.15	Golden Plover_GP	18	c.40	10.3	IN	335	140	160	35			
1	22/01/2018	10.15	13.15	Golden Plover_GP	18	c.40	10.3	OUT	15		15				
1	22/01/2018	10.15	13.15	Golden Plover_GP	19	c.35	10.36	IN	42	32	10				Presume landed on bog
1	22/01/2018	10.15	13.15	Golden Plover_GP	20	12	10.5	IN	169	17	101	51			
1	22/01/2018	10.15	13.15	Golden Plover_GP	21	c.70	11.55	IN	627		43	478	106		Lost in clouds
1	22/01/2018	10.15	13.15	Golden Plover_GP	21	c.70	11.55	OUT	228			120	108		
1	22/01/2018	13.15	16.15	Golden Plover_GP	22	3	15.43	IN	15		15				

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
4	22/01/2018	11.5	15.5	Golden Plover_GP	27	16	11.5	IN	15	15					Flushed on route to VP
4	22/01/2018	11.5	15.5	Golden Plover_GP	28	27	13.05	IN	15					15	Calling, travelling
4	22/01/2018	11.5	15.5	Golden Plover_GP	29	27	13.07	IN	34					34	Calling, travelling
4	22/01/2018	11.5	15.5	Golden Plover_GP	30	35	14.18	IN	289					289	Calling, travelling
4	22/01/2018	11.5	15.5	Golden Plover_GP	31	20		IN	300					300	Calling, travelling
4	22/01/2018	11.5	15.5	Golden Plover_GP	32	20	14.45	IN	164					164	
4	22/01/2018	11.5	15.5	Golden Plover_GP	33	90	15.17	IN	100					100	

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
2	26/01/2018	9	12	Golden Plover_GP	24	3	9.4	IN	132				132		Calling & travelling
2	26/01/2018	9	12	Golden Plover_GP	25	1	11.18	IN	160					160	Calling & travelling
2	26/01/2018	9	12	Golden Plover_GP	25	1	11.18	OUT	20					20	Calling & travelling
2	26/01/2018	9	12	Golden Plover_GP	26	1	11.5	IN	50					50	Calling & travelling
4	26/01/2018	12.3	14.3	Golden Plover_GP	34	16	12.24	IN	25		5	5	15		Flushed, calling
2	23/03/2018	12:20	15:20	Golden Plover_GP	35	18	12:40	IN	270	54	216				
1	08/04/2018	12:15	18:15	Golden Plover_GP	44	16	12:12	IN	7	7					Fog <150m visibility

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
1	08/04/2018	12:15	18:15	Golden Plover_GP	45	7	12:21	IN	8	8					Fog <150m visibility
1	08/04/2018	12:15	18:15	Golden Plover_GP	46	43	16:24	IN / OUT	29		29				
4	30/11/2017	9.3	12.3	Hen Harrier_HH	3	1	10.31	IN	22			22			Male flew along WD4edge and into PB2/HH3 then lost below ridge
1	22/01/2018	13.15	16.15	Hen Harrier_HH	4	1	15.46	IN	13	13					Male colouring on upper parts, but juvenile underneath & around face
1	22/01/2018	13.15	16.15	Hen Harrier_HH	5	1	15.47	IN	45	45					Same individual as (2) above
4	22/01/2018	11.5	15.5	Hen Harrier_HH	6	1	14.07	OUT	51	51					Male
2	09/02/2018	11.05	14.05	Hen Harrier_HH	7	1	11.53	IN	55	49	6				Ringtail; mobbed by RN

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
2	09/02/2018	14.05	17.05	Hen Harrier_HH	8	1	14.4	IN	7	7					Male
2	09/02/2018	14.05	17.05	Hen Harrier_HH	8	1	14.40	OUT	8	8					
4	05/11/2017	10:00	16:00	Kestrel_K.	2	1	14:22	IN	167			167			Adult female K. foraging through site, hovered at numerous points for periods of 10-20s, finally lost bird in glare.
3	04/01/2018	10.3	13	Kestrel_K.	1	1	11.58	IN	7	7					Seen briefly- lost below hill/WD4
3	15/11/2017	14.3	17.3	Mallard_MA	-										
3	15/11/2017	11	14	Merlin_ML	1	1	11.59	IN	20				20		Flew straight through, flushing approx. 60 SG
3	15/11/2017	11	14	Merlin_ML	1	1	11.59	OUT	17				17		

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
4	30/11/2017	9.3	12.3	Red Grouse_RG	-										Droppings 50m from VP
2	09/02/2018	11.05	14.05	Red Grouse_RG	-	Dropping		IN							One dropping at VP
2	27/10/2017	09:30	15:30	Snipe_SN	-	2									
1	03/11/2017	10:30	16:30	Snipe_SN	8	1	10:30	IN	2	2					Snipe flushed arriving at VP flew low passing VP2 and over brow of hill
3	15/11/2017	14.3	17.3	Snipe_SN	3	2	17.18	IN	20	20					Seen flying past through GA1/GS4 close
1	23/11/2017	10.3	13.3	Snipe_SN	1	1	11.24	IN	11	11					Flushed from behind (west) of VP1
1	23/11/2017	10.3	13.3	Snipe_SN	2	1	11.53	IN	9	9					Flushed

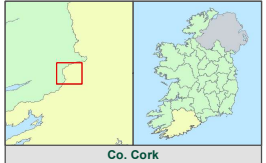
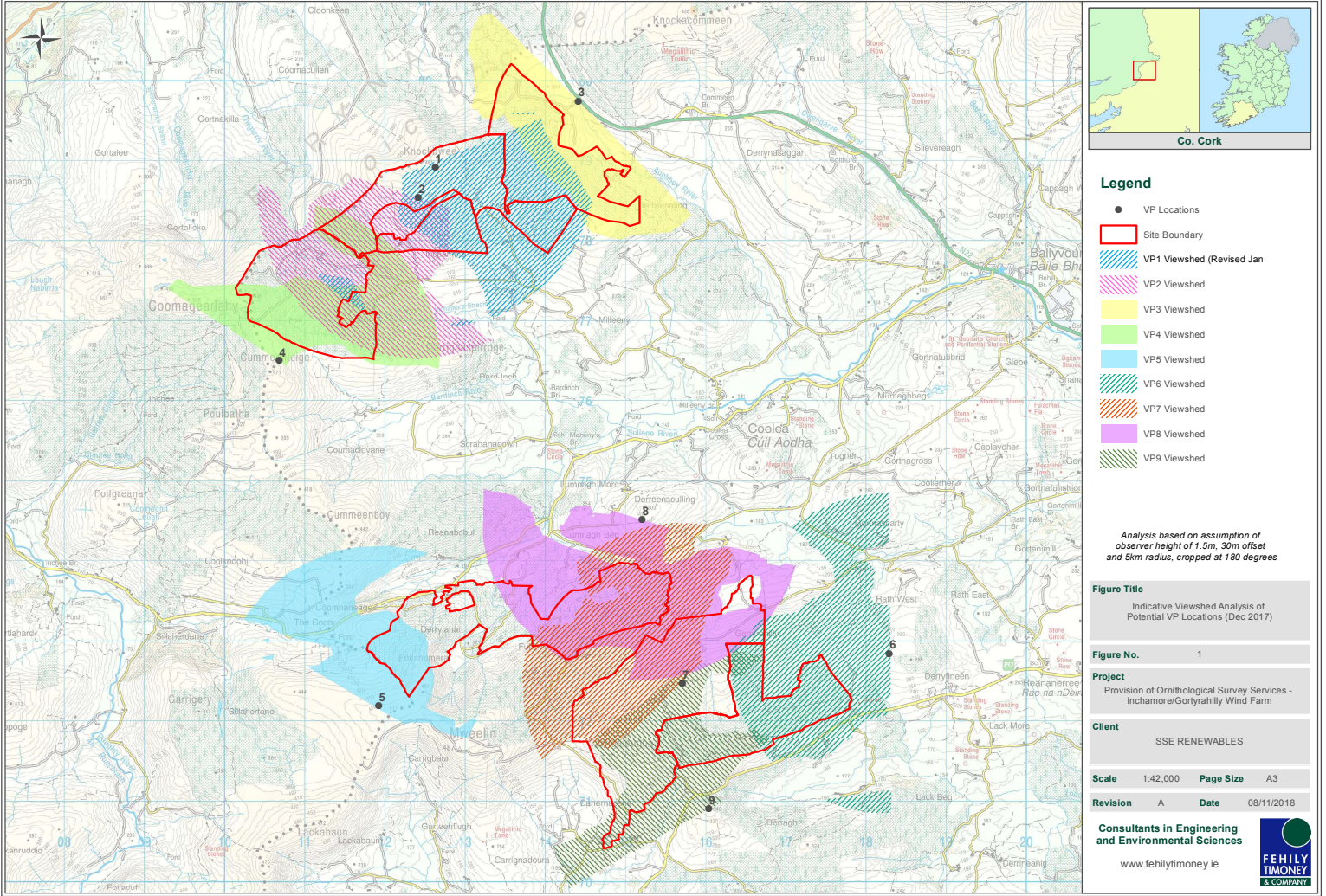
VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
4	30/11/2017	9.3	12.3	Snipe_SN	4	1	10.06	IN	5	5					Flushed
1	22/01/2018	10.15	13.15	Snipe_SN	5	1	10.15	IN							Flushed on arrival at VP
1	22/01/2018	10.15	13.15	Snipe_SN	6	1	11.49	IN	2	2					Flushed from behind VP
3	08/02/2018	8.3	11.3	Snipe_SN	7	1	11.19	IN	24	24					Travelling, landed in HH3
3	01/12/2017	12.45	15.45	Sparrowhawk_SH	-	1	15.31	IN	4	4					
3	01/12/2017	12.45	15.45	Sparrowhawk_SH	-			OUT	16	16					
1	22/01/2018	10.15	13.15	White-tailed Eagle_WE	1	1	10.53	OUT	26	6	20				Silhouette only observed, so age not determined

VP no.	Date	Start Time	End Time	Species	Flight line no.	Species quantity	Start Time	Inside / outside Buffer	Total Duration (s)	0-20 (s)	20-40 (s)	40-80 (s)	80-150 (s)	>150 (s)	Bird Notes
1	22/01/2018	10.15	13.15	White-tailed Eagle_WE	1	1	10.53	IN	8	2	4				Ground beneath flightpath not visible (hidden behind ridge) so mapping accuracy reduced
3	15/11/2017	14.3	17.3	Woodcock_WK	1	1	17.04	IN	2						Seen flying low coming from a small coniferous belt with a stream running through

Appendix 4

Figures





Legend

- VP Locations
- ▭ Site Boundary
- ▨ VP1 Viewshed (Revised Jan)
- ▨ VP2 Viewshed
- ▨ VP3 Viewshed
- ▨ VP4 Viewshed
- ▨ VP5 Viewshed
- ▨ VP6 Viewshed
- ▨ VP7 Viewshed
- ▨ VP8 Viewshed
- ▨ VP9 Viewshed

Analysis based on assumption of observer height of 1.5m, 30m offset and 5km radius, cropped at 180 degrees

Figure Title
Indicative Viewshed Analysis of Potential VP Locations (Dec 2017)

Figure No. 1


Project
Provision of Orthothology Survey Services - Inchamore/Gorylahilly Wind Farm

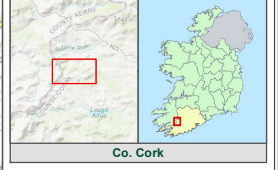
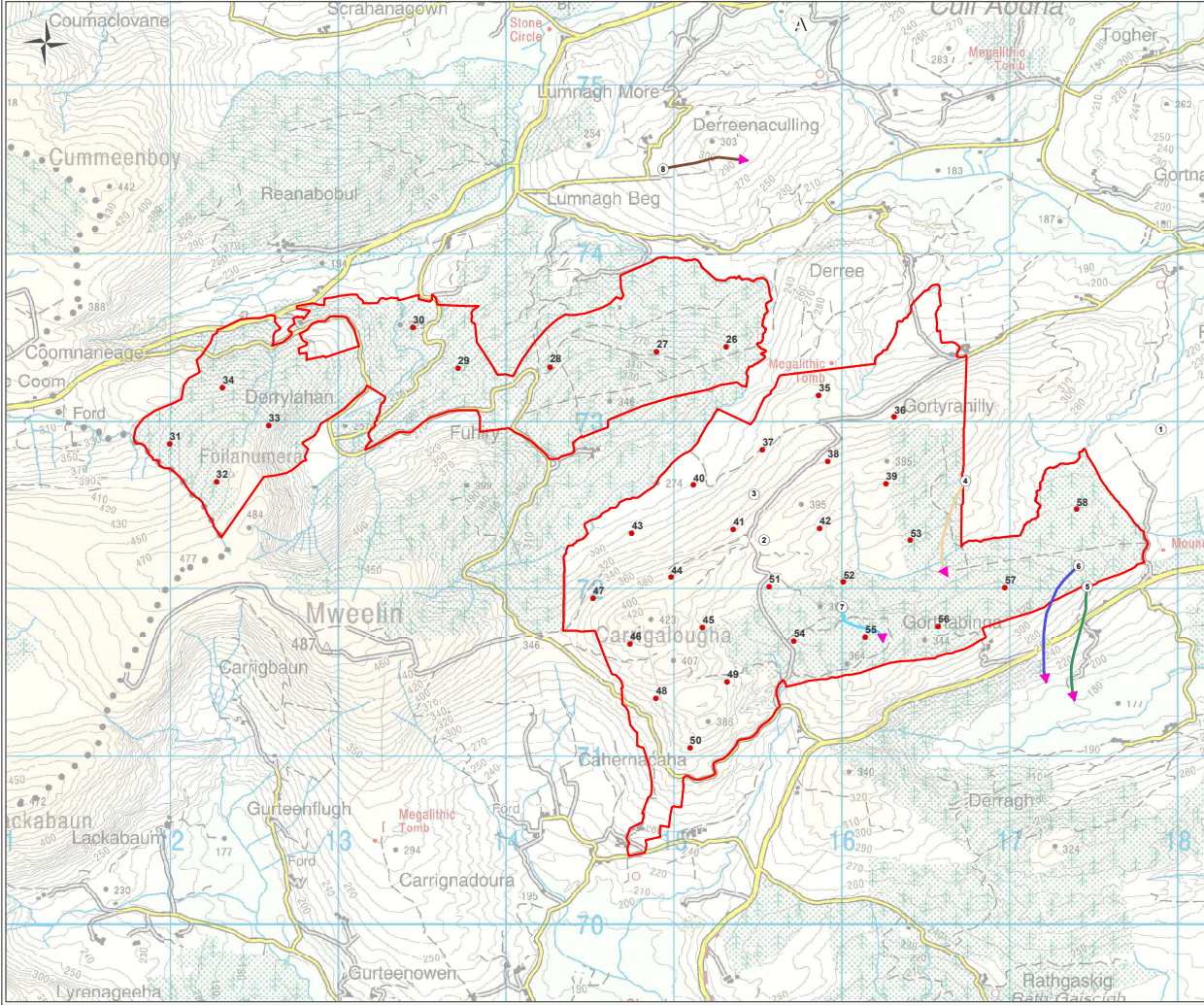
Client
SSE RENEWABLES

Scale 1:42,000 **Page Size** A3

Revision A **Date** 08/11/2018

Consultants in Engineering and Environmental Sciences
www.fehilytimoney.ie





Legend

- Site Boundary
- Indicative Turbine Locations
- ID, Date, Species
- 1, 29/06/2017, K
- 2, 28/07/2017, K
- 3, 28/07/2017, K
- 4, 29/07/2017, K
- 5, 17/09/2017, K
- 6, 17/09/2017, K
- 7, 09/05/2017, K
- 8, 28/04/2017, K

Figure Title	Bird Flightlines Summer 2017-2018 Kestrel	
Figure No.	1	
Project	Gortnahilly Wind Farm	
Client	SSE Renewables	
Scale	1:22,500	Page Size A3
Revision	A	Date 08/11/2018
Consultants in Engineering and Environmental Sciences www.fehilytimoney.ie		