

MWP

Bird Impact Assessment Report
Glenora Wind Farm, Glenora, Co. Mayo.

SSE Renewables Ireland Limited

December 2023

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1. Introduction

Consent is being sought by Glenora Wind Farm DAC (the “Applicant”), which is a joint venture between SSE Renewables Ireland Limited (SSE) and FuturEnergy Ireland, from An Bord Pleanála (ABP) (the competent authority), for the development of a 22 No. turbine wind development and associated works in Glenora and adjacent townlands, near the village of Ballycastle, County Mayo (the “Proposed Development”), as described in more detail in Chapter 4 of the Environmental Impact Assessment Report (EIAR), being prepared by McCarthy Keville O’Sullivan (MKO) Planning and Environmental Consultants.

Malachy Walsh and Partners (MWP) Engineering and Environmental Consultants undertook ornithological surveys of the proposed wind farm site on behalf of SSE on a monthly basis between April 2019 and March 2023. MWP were commissioned by SSE to prepare a Bird Impact Assessment Report (BIAR) which has been used by MKO in the preparation of the Ornithology chapter of the EIAR for the Proposed Development.

This BIAR describes the avian ecology of the ornithological study area, defined as the proposed wind farm site, as shown in **Figure 1** and **Figure 2** below and on all accompanying mapping appended, and the surrounding area, extending outwards to 500 m, to account for birds potentially affected by the proposed wind farm development (refer to **Section 1.1** below). Relevant mapping, including the proposed wind farm site boundary, was provided by SSE at the outset and throughout the project.

The aim of this impact assessment is to assess whether the proposed wind farm development is likely to result in significant effects on those bird species considered to comprise potential avian receptors of the proposed wind farm development. Where potential impacts are identified, mitigation measures have been developed to avoid or reduce significant effects. This assessment is based on a desktop study including published literature, and on ornithological surveys completed consecutively at the ornithological study area over the four-year period from April 2019 to March 2023, inclusive.

This BIAR includes descriptions and results of all bird surveys undertaken by MWP during this timeframe, comprising the following survey periods:

- Summer 2019
- Winter 2019/2020
- Summer 2020
- Winter 2020/2021
- Summer 2021
- Winter 2021/2022
- Summer 2022
- Winter 2022/2023

Areas designated for nature conservation under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended) (the EU Habitats Directive) and Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the EU Birds Directive) (otherwise known as European Sites) have been considered in a standalone Screening for Appropriate Assessment report and Natura Impact Statement (NIS) report, both prepared by MKO and included as part of this planning application.

1.1 Scope of Assessment

This report comprises an ecological impact assessment of the proposed wind farm development focusing on avian species which may be potentially affected. The process will determine whether the site's avian fauna will be subject to impacts arising from the proposed wind farm development and will then characterise these impacts and their effects in terms of significance.

The report is set out as follows:

- **Section 2** describes the methodology used to collect information on the avian features of the proposed wind farm site and surrounds (features may comprise species or protected sites of ornithological interest).
- **Sections 3.2 to 3.4** describe the avian features considered to be within the Zone of Influence (ZOI) of the proposed wind farm development.
- **Section 3.5** identifies and selects those features considered to comprise receptors upon which impacts ensuing from the proposed wind farm development are likely. These are referred to as Important Ecological Features (IEFs).
- **Section 4** identifies the potential direct, indirect and cumulative impacts of the proposed wind farm development that are probable or likely to occur during its lifetime and assesses whether said impacts are likely to result in significant direct, indirect or cumulative effects upon the IEFs.
- **Section 5**, where necessary, proposes mitigation and monitoring measures to remove or reduce those impacts.
- **Section 6** assesses the residual ecological effects of the proposed wind farm development (those remaining after mitigation).

The ZOI for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities (CIEEM, 2019). The ZOI of the proposed wind farm development was established using professional judgement and relevant information including details of the project's extent and characteristics, the desk study and field survey results, Scottish Natural Heritage (SNH) (2016) guidance for establishing connectivity with Special Protection Areas (SPAs), and CIEEM (2019) and EPA (2022) guidance. The ZOI differs between different ecological receptors and is generally considered to extend out to a 500 m distance around the proposed wind farm site, out to a maximum of 2 km in the case of some species.

Features of avian significance occurring or likely to occur within the ZOI of the proposed wind farm development were considered as potential IEFs. These are the important features that could potentially be affected by the proposed wind farm development and should be subject to detailed assessment (CIEEM, 2019). IEFs were considered to be bird species identified as important based on results of the ornithological surveys completed within the study area over the four-year survey period (April 2019 – March 2023, inclusive), as well as designated sites for nature conservation which support important bird populations.

This report quantifies any potential impacts relating to these IEFs and identifies any measures required to avoid, reduce and mitigate likely significant effects. Identification of effects and prescribed mitigation has been derived following a collaborative approach working with a multi-disciplinary team including ornithologists, ecologists, and project engineers. The results of the ornithological surveys have been utilised to inform the design of the project, thereby minimising potential effects on avian ecology and sensitive habitats.

The information provided in this report describes the baseline ornithological environment; provides an accurate prediction of the potential impacts on identified IEFs from the proposed wind farm development; prescribes mitigation where necessary; and describes the residual effects on avian ecology.

1.2 Legislation and Guidance

The most important legislation underpinning biodiversity and nature conservation in Ireland are the:

- Wildlife Acts 1976 to 2021 (as amended)
- European Union Habitats Directive
- European Union Birds Directive
- European Communities (Birds and Natural Habitats) Regulations 2011 to 2015 (as amended)
- Planning and Development Act (2000) (as amended)
- Planning and Development Regulations 2001 to 2022 (as amended)

The impact assessment was undertaken in accordance with the recent EPA best-practice guidance 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022).

The following other guidance documents and relevant publications were also considered:

- Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species (NatureScot, 2022)
- Birds of Conservation Concern in Ireland 4: 2020 – 2026 (Gilbert *et al.*, 2021)
- Guidance document on wind energy developments and EU nature legislation. Guidance document (European Commission, 2020)
- Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2019)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017)
- Best Practice Guidelines for the Irish Wind Energy Industry (Irish Wind Energy Association, 2012)
- Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage (SNH, 2017)
- Assessing Connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage (SNH, 2016)
- Assessing the Cumulative Impact of Onshore Wind Energy Developments. Scottish Natural Heritage (SNH, 2012)
- Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas (SNH, 2006)
- Birds and wind farms in Ireland: a review of potential issues and impact assessment (Percival, S. M., 2003).

1.3 Site Location

The proposed wind farm site is located in northwest County Mayo, approximately 6.2 km southwest of Ballycastle and 17 km northwest of Crossmolina. Access to the site is via a local road and existing forestry roads/tracks linked to the Regional R314 Road from Ballycastle which is the closest centre of population (see **Figure 1** below). The proposed wind farm site comprises mainly commercial forestry surrounded by peatland habitats.

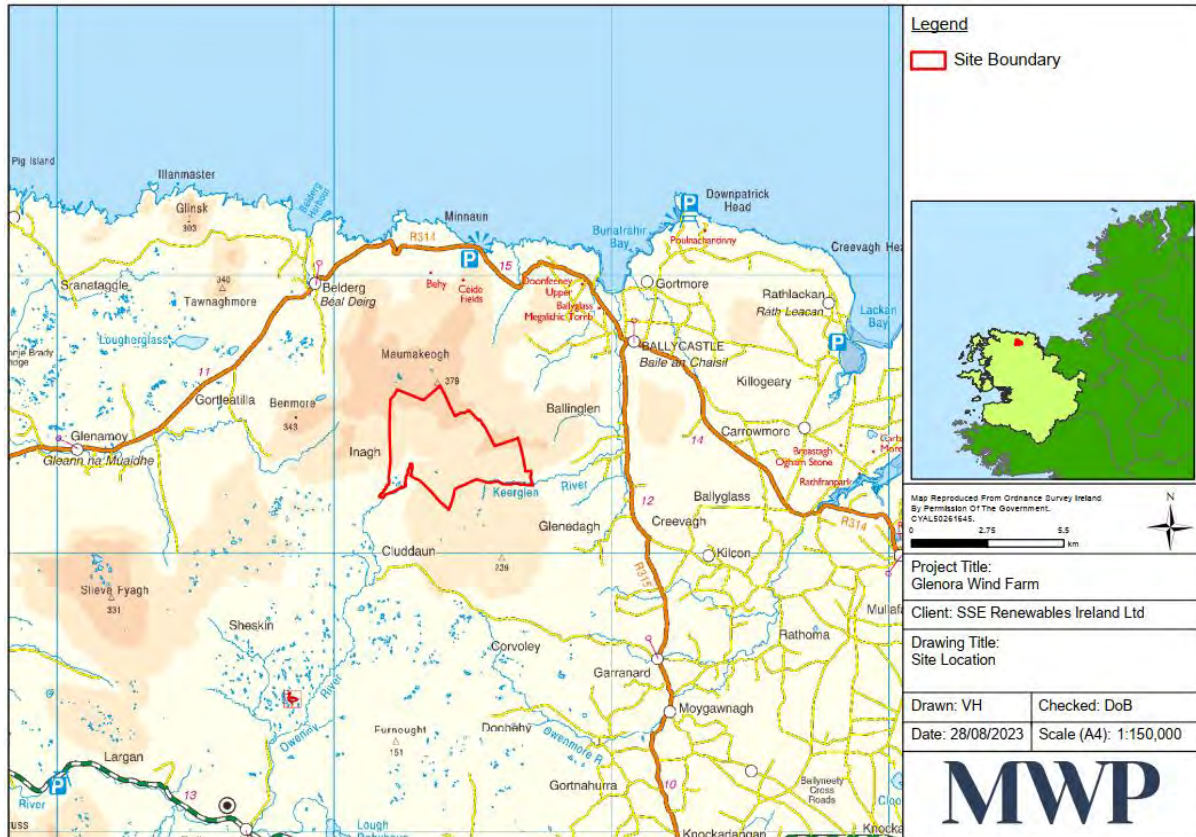


Figure 1. Location of proposed wind farm development site (BIAR site)

1.4 Description of the Development

The proposed wind farm development comprises the construction of 22 No. wind turbines and all associated works. The proposed turbines will have a blade tip height of 180 metres above the top of the foundation. The applicant is seeking a ten-year planning permission. The full description of the Proposed Development as per the public planning notices, is as follows:

1. Construction of 22 no. wind turbines and all associated hardstand areas with the following parameters:
 - a) A total blade tip height of 180 m,
 - b) Hub height of 99 m, and
 - c) Rotor diameter of 162 m.
2. 1 no. permanent Meteorological Anemometry Masts with a height of 99 m and associated hardstanding area;
3. Upgrade of existing tracks and roads, provision of new permanent site access roads, and upgrade of 1 no. existing site entrance including the provision of 1 no. security cabin with automatic traffic barriers;

4. Temporary widening of sections of public road in the townland of Ballyglass;
5. The provision of a new temporary roadway in the townland of Ballyglass to facilitate the delivery of turbine components and other abnormal loads;
6. 1 no. wind farm operation and maintenance control building in the townland of Glenora;
7. 3 no. borrow pits.
8. 13 no. permanent peat placement areas.
9. 5 no. temporary construction compounds with temporary site offices and staff facilities;
10. Permanent recreation and amenity works, including marked trails, seating areas, amenity car park, and associated amenity signage;
11. Site drainage;
12. Site Signage;
13. Ancillary forestry felling to facilitate construction and operation of the proposed development;
14. All works associated with the habitat enhancement and biodiversity management within the proposed wind farm site;
15. All associated site development works and ancillary infrastructure.

This application is seeking a ten-year permission and 35-year operational life from the date of the development's commissioning.

The layout of the proposed wind farm development has been led by consideration of constraints and facilitators, thereby avoiding the environmentally sensitive parts of the site. The roads layout for the proposed wind farm development maximises the use of the existing onsite access roads and tracks where possible, with approximately 15.4 km of existing roadway/tracks requiring upgrading and approximately 10.5 km of new access road to be constructed.

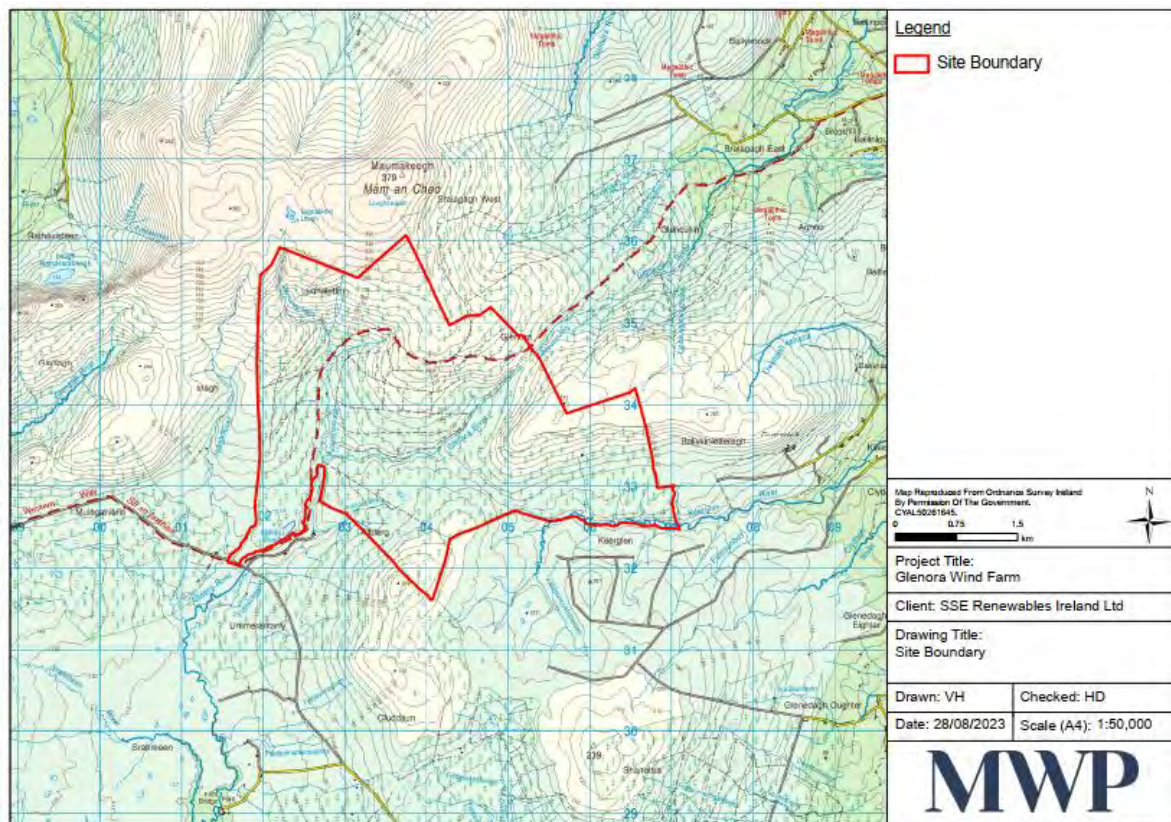


Figure 2. Proposed wind farm development site boundary (BIAR site boundary)

It is intended to construct a 110 kV substation within the site and to connect this to the existing Tawnaghmore 110 kV substation, located 14 km southeast of the intended on-site substation location, in the townland of Bellacorick. The intended grid connection route will be via underground cabling located within existing forestry tracks, local county roads and national secondary roads. The cabling route measures approximately 26 km in total.

The majority of the area encompassed within the proposed wind farm site boundary (BIAR site boundary) is currently used for commercial forestry, a small proportion of which will be felled to accommodate the proposed wind farm. A total area of approximately 116 hectares of commercial forestry will require replacement elsewhere in the State, subject to licence.

1.5 Consultation

A consultation exercise was undertaken by MKO with regard to the Proposed Development. **Table 1** below provides a list of the organisations consulted by MKO and notes where responses have been received.

Table 1. Scoping response summary (Source: MKO)

No.	Consultee	Response to Consultation
1	BirdWatch Ireland	No response received
2	National Parks and Wildlife Service (data request for protected and threatened species records for hectads F92 and G03)	Response to data request received 31 st December 2021
3	Irish Raptor Study Group	No response received

No.	Consultee	Response to Consultation
4	Irish Wildlife Trust	No response received
5	Irish Red Grouse Association	No response received

As part of the scoping response received from the Department of Tourism, Culture, Arts, Gaeltacht, Sports and Media Development Application Unit (DAU), target species identified for the site included Annex I (Birds Directive) species and Birds of Conservation Concern (BoCCI) such as hen harrier, merlin, Greenland white-fronted goose (Bog of Erris flock), golden plover and red grouse, with reference made to other species of note recorded in the area such as snowy owl and golden eagle.

A pre-planning meeting was held between MKO, SSE and NPWS on the 24th of September 2021. During the meeting, the NPWS made reference to potential effects on merlin (*Falco columbarius*) should there be a requirement for pre-construction tree felling (please refer to **Section 4.2** and **Section 5**). They also emphasised the importance of acquiring bird data, pre and post construction, from other nearby wind farm projects (please refer to **Section 3.2.8**). A second pre-planning meeting was held with NPWS on the 24th January 2022, attended by MKO, SSE and MWP. During this meeting, merlin and other raptor species were discussed.

1.6 Statement of Authority

This report has been prepared by Hazel Dalton (BSc., BBus.), Senior Ecologist with MWP, and Deirdre O’ Brien (BSc.), Ecologist with MWP, together with Brian Madden (BA. Mod., Ph.D., MCIEEM) of BioSphere Environmental Services, who completed the impact assessment and mitigation sections (**Sections 4, 5, 6 and 7**).

Hazel is a Senior Ecologist with over eight years' experience with MWP since graduating in 2015, having worked with the company on a periodic part-time basis prior to graduating. She has experience in ecological surveying and impact assessment for both Appropriate Assessment (AA) and EIA and has authored and contributed to numerous screening reports for AA, Natura Impact Statements (NIS) and Ecological Impact Assessment (EclA) reports. She has completed assessments for a wide variety of projects including for renewable energy, infrastructure, coastal development, and other development projects. She is an experienced field ecologist and has a diverse ecological survey profile including for habitats and flora, mammals and birds.

Deirdre has been working with MWP since 2018 and on a full-time basis since 2019. During that time, she has carried out field surveys for flora and invasive species, birds and freshwater macroinvertebrate sampling and identification, including for freshwater pearl mussel. She has been formally trained in Stage 1 and Stage 2 freshwater pearl mussel Surveying (Dr. Evelyn Moorkens). She has also gained experience in standard field survey methodologies including mammal surveying and habitat mapping. She has acquired experience in the completion of AA screening reports, NIS reports and EclA. She has experience with general ecological report writing, has completed numerous reports for bird survey work and is experienced in collation of survey data.

Brian graduated in Natural Sciences from the University of Dublin in 1984 and earned a Ph.D. degree in 1990 from the National University of Ireland for his research on ecosystem processes in raised bogs. Since then, he has carried out botanical surveys and habitat assessments for most terrestrial habitats which occur on the island of Ireland. Brian is an experienced ornithologist, with particular interests in birds of prey and peatland birds. Brian is the principal ecologist with BioSphere Environmental Services. The consultancy specialises in energy related developments, including wind farms, solar farms, overhead power lines and substations. Brian has been the lead ecologist on the Oweninny Wind Farm Project since 2010.

This report was internally reviewed by Úna Williams (BSc., MSc.), Ecologist and Environmental Scientist with MWP. She is experienced in various ecological field survey methodologies including habitat mapping and zoological

surveys and has spent time carrying out ecological research in Costa Rica and in Seville. She has undertaken assessments for a wide variety of projects including for renewable energy developments, and infrastructural and coastal development projects. Úna has carried out numerous Collision Risk Models and has completed many ecological reports including screening reports for AA, NIS reports, EIA and EclA.

The field surveys were designed by John N. Murphy (former Project Ornithologist with MWP and consultant Senior Ornithologist). Field surveyors involved in the project included Páidi Cullinan, Shane Cully, Austin Cooney, John Collins, Luíse Ní Dhonnabháin, Joe Kelly, Stan Nugent and Frank Connelly.

The reliability of survey work is dependent upon the observers used to collect the underlying information. The surveyors used have the relevant competence, experience and expertise to carry out the surveys, as evidenced by their profiles included in **Appendix 1**.

2. Methodology

2.1 Scientific Nomenclature: Conventions

Species nomenclature follows the standard form of the common name, followed by the binomial, on the first instance of usage in the text or the first instance of usage in a table. Thereafter, for any subsequent usage, common names only are used.

2.2 Desktop Study

In 2019, an initial desktop study was carried out by MWP prior to the commencement of the field surveys. This was supplemented by further desktop studies undertaken during the preparation of the various bird survey reports prepared by MWP for the proposed wind farm development.

A comprehensive desk study was undertaken by MKO in February 2022 (updated January 2023) in relation to preparation of the BIAR for the proposed wind farm development to search for any relevant information on species of conservation concern that may potentially make use of the proposed wind farm site. The MKO desk-top assessment included a thorough review of available ornithological data and included a review of specially requested records from the NPWS Rare and Protected Species Database. This desk-top study was provided by MKO and was used in the preparation of this report.

The desktop studies provided the opportunity to gain an understanding of the bird populations' potentially occurring via an investigation of the habitats present and previous species records. The desktop study area included the lands encompassed within and surrounding the proposed wind farm development site, as well as areas that are geographically distant from the site but whose avian interests may be indirectly affected by the various phases of the proposed wind farm development from construction through to decommissioning.

As part of the desk-top studies undertaken, available ornithological information and data was reviewed, including:

- Ordnance Survey Ireland (OSI) aerial photography and 1:50000 mapping, and other sources of online aerial imagery
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC)
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons *et al.*, 1993; Balmer *et al.*, 2013)

- Review of Birds of Conservation Concern in Ireland (BoCCI) 2020-2026 (Gilbert *et al.*, 2021), and Birds of Conservation Concern in Ireland (BoCCI) 2014-2019 (Colhoun & Cummins, 2013)
- Review of BirdWatch Ireland I-WeBS (Irish Wetland Bird Surveys) site information
- General ornithological information available from BirdWatch Ireland (www.birdwatchireland.ie)
- Review of the 2015 National Survey of Breeding Hen Harrier in Ireland Report (Ruddock *et al.* 2016)
- Other information sources and reports footnoted throughout the report

2.3 Criteria for Identifying Target Species

A reconnaissance survey was undertaken by the Project Ornithologist prior to the commencement of bird surveys to review the habitats at the proposed wind farm site and the general landscape character of the study area in the context of its potential ornithological importance.

The results of the comprehensive desk-top study, in conjunction with the site reconnaissance surveys, were used to identify target bird species which were considered likely to occur within the ZOI of the proposed wind farm development. Target species are typically those species which are afforded a higher level of legislative protection or are considered to be more sensitive to potential impacts from wind farm developments by virtue of their behaviour (SNH, 2017). Target species should be restricted to those likely to be affected by wind farms (SNH, 2017).

With regards to drawing up the target species list for Glenora, the SNH (2017) guidance was followed. This guidance outlines important sources of potential target species.

In conjunction with the findings of the desk-top study, the target species list was drawn from:

- Annex I of the EU Birds Directive
- Red-listed birds of Conservation Concern (Gilbert *et al.*, 2021; Colhoun & Cummins, 2013)
- Other species generally considered more sensitive to potential impacts from wind farms (such as species of raptor - buzzards, eagles, falcons, harriers, hawks, kites, osprey, owls (protected under the Fourth Schedule of the Wildlife Acts 1976-2021, as amended).

The target species formed the main focus of the bird surveys undertaken. To ensure other species which may potentially be sensitive to wind farms were not missed during surveys, all other species of gull, wader, duck, diver, goose, swan, cormorant and heron not included as target species were included as secondary species, and flight activity data recorded where it did not infringe on the collection of target species data.

It is generally considered that passerine species are not significantly impacted by wind farms (SNH, 2017); however, counts of passerines seen/heard during VP surveys were recorded to provide a complete picture of bird usage of the site.

Please refer to **Section 3.2.14** for the list of target species for the proposed wind farm development.

2.4 Field Surveys

Initial reconnaissance walkovers of the site were carried out to assist in determining the required scope and extent of the ornithological surveys.

Field surveys were undertaken to gather detailed information on bird distribution and flight activity to assist in predicting the potential effects of the proposed wind farm development on local bird populations.

The field surveys comprised two main elements: vantage point (VP) watches to gather flight activity data for target species (refer to **Section 2.4.1** below), and distribution and abundance surveys to gain an understanding of bird species occurring in the area which may be subject to impacts from the proposed wind farm development (refer to **Section 2.4.2** below).

2.4.1 Vantage Point (VP) Surveys

VP surveys were carried out in accordance with the SNH guidance document '*Recommended bird survey methods to inform impact assessment of onshore wind farms*' (SNH, 2017). The overall aim of these surveys was to quantify the level of target species flight activity within the flight activity survey area which was taken to be that area encompassing the proposed wind farm site extending out to a distance of 500 m beyond the site boundary.

SNH (2017) recommends a minimum 2-year survey period comprising 72 hours per VP location divided between seasons (36 hours breeding and 36 hours non-breeding) per year. VP surveys were undertaken on a monthly basis by qualified personnel for the winter and breeding seasons encompassed in the 4-year period April 2019 to March 2023, inclusive. The recommended minimum 36 survey hours were generally achieved at each VP location in each season during the overall 4-year survey period. Overall, the minimum total number of VP hours recommended by SNH (2017) was achieved at all VPs.

Please refer to **Appendix 3** for more detailed information on VP survey effort.

2.4.1.1 Selection of VP Locations

To achieve maximum visibility of the site, VPs should ideally be located on elevated areas or other locations that provide clear views over the survey area.

To minimise observer effect on bird behaviour, VPs are best located outside the survey area where feasible; however, since detection of flight activity decreases with distance, VPs should be located as close to the survey area as possible. SNH (2017) stipulates that if VPs are located within the survey area, they should not be used simultaneously with other VP's which overlook them to minimise potential observer effect on bird behaviour. According to SNH (2017), VP viewsheds should extend out to a maximum distance of 2 km, the full extent of which should be readily viewed using a telescope.

VP locations were selected to provide maximum site coverage. Seven VP locations were selected and surveyed over the course of the winter and breeding seasons. The Irish Transverse Mercator (ITM) grid co-ordinates for each VP location are provided in **Table 2** below. Maps showing the locations of each VP and the viewsheds from each VP in order to show the extent of site coverage are provided in **Appendix 2**. A summary of survey effort at individual VPs, including survey dates, times and weather conditions can be found in **Appendix 3**.

Table 2. VP locations

Vantage Point	ITM Grid Coordinates
1	501874 833565
2	503387 834934
3	504150 834475
4	505610 832136
5	507221 832235
6	503674 835781
7	505664 834300

2.4.1.2 Viewshed Analysis of VP Locations

Viewshed analysis was undertaken for each VP location to determine visual coverage of the survey area. Viewsheds were set to observer height of 1.6 m and a target height of 25 m. Viewsheds encompassed a 2 km radius with a 360-degree view. Each viewshed was then cropped to a 180-degree arc showing the relevant direction of view. VP viewshed extents were confirmed by surveyors as part of a ground truthing exercise. 92% of the current proposed turbine layout plus 500 m radius buffer around turbines is encompassed within the VP viewsheds (please also see **Section 2.9.2** below). Viewsheds from each VP showing the extent of site coverage are provided in **Appendix 2**.

2.4.1.3 Flight Data Recording

During VP surveys the flight behaviour of target species was recorded. Based on the precautionary principle, flight behaviour of secondary species was also recorded; however, recording of secondary species was subsidiary to recording of target species (SNH, 2017). At the time of observation, the following information was recorded for each species:

- The time the bird was detected
- The flight direction and duration (seconds) within various flight height categories
- Sex and age of the bird(s) (adult/juvenile), where possible to determine
- Type of activity/behaviour such as hunting, flying, displaying, etc
- Estimation of actual flight height
- Habitat(s) in which the bird was observed
- Weather conditions at time of sighting including wind speed, direction, degree of visibility.

Once an initial sighting was made, each target or secondary species was observed until lost from view. Flight paths were recorded as they were observed, including where birds travelled to or if observed outside of the flight activity survey area; such that all flight activity within the broader landscape was encompassed.

This information is provided in tabulated format in **Appendix 4**. A unique map identifier code was assigned to each target/secondary species which corresponds to a mapped flight path. All flight paths are provided in **Appendix 5**.

2.4.1.4 Recording of Other Species

During the VP surveys, counts of non-target/secondary species were also recorded where recording did not infringe on recording of target/secondary species flight data. Monthly peak counts of all non-target/secondary species of conservation concern recorded during VP surveys are provided in **Appendix 6**.

2.4.2 Distribution and Abundance Surveys

A variety of distribution and abundance surveys were carried out to record numbers and distributions of local and migrant bird species using the site or surrounding area that might be affected, either directly or indirectly, by the proposal.

The project ornithologist and survey team decide the most suitable surveys to employ at a site in terms of site conditions and habitat diversity. This, in combination with the results of the desktop studies, informed the bird survey scope and approach taken for the distribution and abundance surveys at the study area.

The targeted distribution and abundance surveys undertaken comprised the following elements:

Breeding Season (April to September)

- Transect and Point Count surveys
- Walkover surveys
- Nocturnal Surveys
- Hinterland Surveys

Winter Season (October to March)

- Transect and Point Count surveys
- Walkover surveys
- Hinterland surveys

2.4.2.1 Breeding Season

2.4.2.1.1 Transect Surveys with Point Counts (within BIAR Site)

A transect survey is a survey along a defined route. The overall aim of the transect surveys was to assess the breeding distribution of target species, including breeding waders and raptors, and gather data on usage of the area encompassed within the proposed wind farm site boundary. Data was also recorded with regard to non-target species to capture abundance information on general breeding bird distribution within the wind farm development area. The methodology was broadly based on methods described in Bibby *et al.*, (2000) and Gilbert *et al.*, (1998).

Transects were completed on a monthly basis during the breeding season period for the first two years of surveys, as set out in **Table 3** below. Following the collection of two full years of monthly transect data (see also **Table 8** below with regard to winter season transect surveys) and having regard to the low numbers of target species recorded on a monthly basis within the wind farm site during both 2019 and 2020 (see **Section 3.3.1** and **Appendix 8** for transect results), the frequency of transect surveys was reduced and they were subsequently completed on a rotational basis comprising three months per breeding season for both 2021 and 2022, as set out in **Table 3** below. This revised approach was replicated for the 2021/22 and 2022/23 winter season transects (see **Section 2.4.2.2.1** below).

Table 3. Breeding transects survey months within BIAR Site (2019 - 2022)

Survey Period	Corresponding Transect Survey Months
Breeding 2019	April, May, June, July, August and September 2019
Breeding 2020	May*, June, July, August and September 2020
Breeding 2021	April, June and August 2021
Breeding 2022	June, July and September 2022

*May 2020 transects were done twice to account for transect surveys missed in April, due to Covid-19 restrictions

Transect surveys were completed within the proposed wind farm site boundary using two separate transect routes (A & B) which utilised the existing internal forestry access road network within the site (see **Appendix 2** for mapped transect routes). The transect routes were selected to provide representative coverage of all habitats, both open and closed, occurring within the proposed wind farm site boundary, comprising mainly mature forestry and clearfell.

Counts of all bird species seen or heard, typically within 100 m of the transect routes, were recorded, although the topography of the landscape often allowed for detection of birds at greater distances. Where target and/or secondary species were recorded, areas of activity and general behaviour was noted/mapped.

Birds were also surveyed during each transect using point count (PC) methodologies. Point count locations were sited at 500 m to 600 m intervals along the overall length of each transect route. Transect A encompassed ten PC locations (PC1- PC10) and Transect B encompassed five PC locations (PC1- PC5).

Details on each individual transect survey carried out including survey date, time and weather conditions can be found in **Appendix 7**. Tabulated results of peak counts for all target species and all other species recorded during transect and point count surveys are provided in **Appendix 8**.

2.4.2.1.2 Breeding Season Walkover Surveys (within 500 m survey area around BIAR Site)

Breeding season walkover surveys were undertaken to determine the presence of target species within areas of potentially suitable breeding habitat within the 500 m survey area buffer surrounding the proposed wind farm site. The methodologies were broadly based on methods described in Bibby *et al.*, (2000) and Gilbert *et al.*, (1998).

Breeding season walkover routes encompassed areas of potentially suitable habitat, comprising open bog, occurring within the 500 m buffer surrounding the site. A total of two different survey routes (A & B) were utilised over the course of the overall breeding season survey periods (summer 2019 to summer 2022). Route A encompassed the open bog extending north and west from the proposed wind farm site boundary, while Route B encompassed the open bog situated to the north-east of the proposed wind farm site boundary.

The majority of open bog surrounding the proposed wind farm site was encompassed by the walkover routes utilised. An area of bog within the 500 m buffer to the east of the site was not included due to the very steep terrain and H&S concerns; however, this area was entirely covered by the viewsheds of VP4 and VP5 which would have contributed to the capture of target species activity in this area, where occurring. Breeding season walkover routes are mapped in **Appendix 2**.

With regard to the timing of breeding season walkover surveys, there were survey constraints (associated with weather conditions, Covid restrictions etc.,) which affected when surveys were ultimately undertaken. This is discussed further in **Section 2.9.4** below.

During each breeding season walkover survey, surveyors walked the routes through open bog, recording any target and secondary species activity, with a focus on red grouse, merlin and other raptors, golden plover and other moorland breeding species such as snipe. Birds were considered to represent breeding birds if they were observed displaying or singing, if nest, eggs or young were located, if adults repeatedly alarm called or if they performed distraction displays or were observed in territorial disputes.

The dates on which breeding season walkover surveys were undertaken and the routes which were utilised on each date are outlined in **Table 4** below.

Table 4. Breeding season walkover surveys 2019 – 2022 within 500 m survey area around BIAR Site

Survey Period	Survey Date	Survey Route
Breeding 2019	16 th July 2019	Route A
Breeding 2020	8 th May 2020	Route A & B
Breeding 2021	15 th July 2021	Route A
	21 st July 2021	Route B
	28 th July 2021	Route A & B
Breeding 2022	17 th June 2022	Route A & B
	24 th August 2022	Route A & B

2.4.2.1.3 Nocturnal Breeding Surveys (within BIAR Site)

Nocturnal breeding surveys were undertaken within areas of suitable breeding habitat for woodcock (*Scolopax rusticola*) and nightjar (*Caprimulgus europaeus*) within the proposed wind farm site boundary to record any potential breeding activity. For H&S reasons, these surveys utilised the existing internal forestry access road network within the site.

Nocturnal walkover surveys were undertaken in the 2019, 2021 and 2022 breeding seasons (see **Table 5** below). Following the findings of the 2019 nocturnal walkover survey the route was revised. The 2021 and 2022 nocturnal walkover survey route utilised the same route as the general transect surveys (discussed in **Section 2.4.2.1.1** above). During each nocturnal breeding survey, surveyors slowly walked along pre-selected routes while recording any displaying and/or calling male birds.

Table 5. Nocturnal breeding surveys 2019 - 2022 within BIAR Site

Survey Period	Survey Date	Survey Time
Breeding 2019	20 th June 2019	23:15 – 00:30 Hrs
	20 th August 2019	21:45 – 22:45 Hrs
Breeding 2021	18 th June 2021	23:00 – 00:00 Hrs
Breeding 2022	22 nd June 2022	22:00 – 23:15 Hrs

Please refer to **Appendix 2** for the locations of the nocturnal walkover survey routes utilised in the 2019, 2021 and 2022 breeding seasons. Details on the surveys carried out including survey dates, times and weather conditions and the results can be found in **Appendix 10**.

2.4.2.1.4 Breeding Season Hinterland Survey

Breeding season hinterland surveys, comprising primarily driven transects, encompassing the area surrounding the proposed wind farm site, were undertaken during the 2019, 2021 and 2022 breeding seasons. The driven transects utilised sections of the existing local road network extending out to an approximate 5 km radius of the site. The 2019 breeding season hinterland surveys also encompassed an area of cutover bog located approximately 1.5 km to the north of the site.

The main purpose of these surveys was to identify any potential areas of interest within the area surrounding the site for breeding waterbirds and birds of prey, and record evidence of breeding activity, if any. All target species were recorded, where encountered.

Table 6 below outlines the dates on which hinterland surveys were undertaken during the breeding 2019, breeding 2021 and breeding 2022 survey periods.

Table 6. Breeding season hinterland surveys 2019, 2021, 2022

Survey Period	Survey Date	Survey Type/Area
Breeding 2019	18 th July 2019	Count - Cutover Bog north of site, and Driven Transect
Breeding 2021	28 th June 2021	Driven Transect
Breeding 2022	15 th September 2022	Driven Transect

Maps showing these survey locations are included in **Appendix 2**. Details on each survey carried out including survey date, time and weather conditions and tabulated results can be found in **Appendix 11**.

Wider Hinterland Surveys

Breeding season hinterland surveys were also undertaken on certain dates at pre-selected locations in the wider landscape surrounding the proposed wind farm site identified as having potential for target species to occur. These areas comprised the following:

- Ballycastle Strand/Buntrahir Bay – located approximately 6.1 km to the north-east.
- Downpatrick Head - located approximately 9.5 km to the north-east. This survey focused on counts of birds on sea cliff and on open water and included a driven transect around the area of the headland.

Table 7 below outlines the hinterland surveys undertaken in the wider landscape surrounding the proposed wind farm site over the breeding 2019 to breeding 2022 survey period.

Table 7. Breeding season wider hinterland surveys 2019 - 2022

Survey Period	Survey Date	Survey Type/Area
Breeding 2019	17 th - 19 th July 2019	Count Ballycastle Strand/Bunatrahir Bay Downpatrick Head Driven Transect Downpatrick Head route
Breeding 2020	17 th June 2020	Count Ballycastle Stand/Bunatrahir Bay Downpatrick Hd Driven Transect Downpatrick Head route
Breeding 2021	28 th June 2021	Count Downpatrick Head
Breeding 2022	29 th June 2022	Count Downpatrick Head Driven Transects Downpatrick Head route

Maps showing these survey locations are included in **Appendix 2**. As these survey areas are located well outside the ZOI of the proposed wind farm development, details on each survey carried out including survey date, time and weather conditions and tabulated results are summarised in **Appendix 14** 'Non-core Bird Survey Data'.

2.4.2.2 Winter Season

2.4.2.2.1 Transect Surveys with Point Counts (within BIAR Site)

The overall aim of the transect surveys was to assess the wintering distribution of target species and gather data on usage of the area encompassed within the proposed wind farm site boundary. Data was also recorded with regard to non-target species to capture abundance information on general wintering bird distribution within the wind farm development area. The methodology was broadly based on methods described in Bibby *et al.*, (2000).

Transect surveys were completed within the proposed wind farm site boundary using the same two transect routes (A & B) along existing forestry access tracks as were used during breeding season surveys (see **Appendix 2** for mapped transect routes). The transect routes provided representative coverage of the open and closed habitats, comprising mainly mature forestry and clearfell, encompassed within the proposed wind farm site boundary.

As for the breeding transect surveys (see **Section 2.4.2.1.1** above) transects were completed on a monthly basis during the winter season survey period for the first two full years of survey, after which they were completed on a rotational basis comprising three months per winter season survey period, as set out in **Table 8** below.

Table 8. Winter transects survey months (2019/20 to 2022/23) within BIAR Site

Survey Period	Corresponding Transect Survey Months
Winter 2019/20	October, November, December 2019 & January, February and March 2020
Winter 2020/21	October, November, December 2020 & January, February and March 2021

Survey Period	Corresponding Transect Survey Months
Winter 2021/22	October and December 2021 and January 2022
Winter 2022/23	November 2022 and February and March 2023

As for the breeding season, counts of all wintering bird species seen or heard were recorded. Where target and/or secondary species were recorded, areas of activity and general behaviour was noted/mapped. As for the breeding season, birds were also surveyed during each transect using point count (PC) methodologies.

Details on each individual transect survey carried out including survey date, time and weather conditions can be found in **Appendix 7**. Tabulated results of peak counts for all species recorded during transect and point count surveys are provided in **Appendix 8**.

2.4.2.2.2 Winter Season Walkover Surveys (within 500 m survey area around BIAR Site)

Winter walkover surveys were undertaken to determine the presence of target species within areas of potentially suitable habitat within the study area. As for the breeding season walkover surveys, these surveys focussed on suitable habitat located within the 500 m survey area buffer surrounding the proposed wind farm site. The same walkover routes (Route A & B) as were used during breeding season walkover surveys were used for the winter season walkover surveys (winter 2019/20 to winter 2022/23).

The methodology was broadly based on methods described in Bibby *et al.*, (2000). All target and secondary species were recorded, with a focus on red grouse, merlin, golden plover and other wader and raptor species. During each walkover survey, surveyors walked the pre-selected route(s) within areas of suitable habitat and recorded any calls or activity observed. March surveys undertaken in 2022 and 2023 also contributed to the capture of data on target species potentially breeding in the 500 m survey area (i.e., potential early breeding attempts), where present.

The dates on which winter season walkover surveys were undertaken and the routes which were utilised on each date are outlined in **Table 9** below.

Table 9. Winter season walkover surveys 2019/20 – 2022/23 within 500 m survey area around BIAR Site

Survey Period	Survey Date	Survey Route
Winter 2019/20	21 st February 2020	Route A & B
Winter 2020/21	19 th February 2021	Route A
	24 th February	Route B
Winter 2021/22	10 th November 2021	Route A & B
	9 th February 2022	Route A & B
	14 th March 2022	Route A & B
Winter 2022/23	18 th January 2023	Route A & B
	17 th February 2023	Route A & B
	24 th March 2023	Route A & B

Maps showing these survey locations are included in **Appendix 2**. Details on each survey carried out including survey date, time and weather conditions and tabulated results can be found in **Appendix 9**.

2.4.2.2.3 Winter Season Hinterland Surveys

Winter hinterland surveys, comprising driven transects, were undertaken within the area surrounding the proposed wind farm site on several dates during the 2021/22 and 2022/23 winter survey periods. As for summer, the driven transects utilised the existing local road network extending out to an approximate 5 km radius of the site.

The main purpose of these surveys was to identify any potential areas of interest within the area surrounding the site for wintering waterbirds and birds of prey, and record evidence of activity, if any, with a particular focus on large assemblages of wintering waterbirds, although all target species were recorded, where encountered.

The dates on which winter season hinterland surveys were carried out are outlined in **Table 10** below.

Table 10. Winter season hinterland surveys 2021/22 and 2022/23

Survey Period	Survey Date	Survey Type/Area
Winter 2021/22	15 th November 2021	Driven Transect
	14 th January 2022	
	8 th March 2022	
Winter 2022/23	17 th November 2022	Driven Transect
	1 st March 2023	

Maps showing these survey locations are included in **Appendix 2**. Details on each survey carried out including survey date, time and weather conditions and tabulated results can be found in **Appendix 11**.

Wider Hinterland Surveys

Winter season hinterland surveys were also undertaken on several dates at Ballycastle Strand/Bunrathair Bay during the winter 2019/20, 2021/22 and 2022/23 seasons, taking into account the foraging distances of certain species during the winter season (SNH, 2016). This coastal site is located approximately 6 km north-east of the site. The dates on which these wider winter season hinterland surveys were carried out are outlined in **Table 11** below.

Table 11. Winter season wider hinterland surveys 2019/20, 2021/22 and 2022/23

Survey Period	Survey Date	Survey Type/Area
Winter 2019/20	17 th December 2019	Count Ballycastle Strand (Bunrathair Bay)
	23 rd January 2020	
Winter 2021/22	13 th October 2021	Count Ballycastle Strand (Bunrathair Bay)
	15 th October 2021	
	10 th November 2021	
	18 th November 2021	
	14 th January 2022	
	8 th February 2022	
Winter 2022/23	3 rd March 2022	Count Ballycastle Strand (Bunrathair Bay)
	18 th November 2022	

Maps showing these survey locations are included in **Appendix 2**. As these survey areas are located well outside the ZOI of the Proposed Development, details on each survey carried out including survey date, time and weather conditions and tabulated results are summarised in **Appendix 14** 'Non-core Bird Survey Data'.

2.5 Evaluation of Conservation Importance of Populations of Key Species

Estimates of national population sizes were obtained from the NPWS Article 12 Reporting (2008-2012) which details the status and trends of bird species occurring in Ireland, as well as other sources referenced in relevant sections of this report. Where available, estimates for mean county wintering populations of relevant species were derived from recent I-WeBS data for sites in County Mayo, provided by MKO.

2.5.1 Geographical Framework

The conservation importance of populations of key species identified to occur within the study area was evaluated in accordance with 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

These guidelines, which are specific to Ireland, set out the context for the determination of value on a geographical basis with a hierarchy (International through to Local) assigned based on the importance of any particular ecological receptor.

The NRA (2009) guidelines provide a basis for determination of whether any particular site or species is of importance on the following scale:

- International
- National
- County
- Local Importance (higher value) and
- Local Importance (lower value)

The NRA (2009) guidelines clearly set out the criteria by which each geographic level of importance can be assigned. At the lowest end of the scale, Locally Important (lower value) receptors comprise habitats and species that are widespread, of low ecological significance, and are of importance only in the local area. In contrast, Internationally Important receptors can comprise sites designated for conservation at an international level as part of the Natura 2000 Network or which provide the best examples of habitats, or internationally important populations of protected flora and fauna. The value of bird species is assessed on biodiversity value, legal status and conservation status.

2.6 Identification of Important Ecological Features (IEFs)

For species, Important Ecological Features (IEFs) were considered to comprise target species which were recorded within the ZOI of the proposed wind farm development during bird surveys undertaken over the 4-year survey period. For these species, it is considered that there is potential for likely effects and thus these species are subject to impact assessment. Those species identified as IEFs (**Section 3.5**, below) were brought forward to the impact assessment stage (**Section 4**, below) to determine the likelihood of significant ecological effects to the selected bird species.

Target species which were not recorded at any stage during bird surveys undertaken over the 4-year survey period and for which pathways for significant effects could not be identified were not considered IEFs and thus were excluded from further assessment.

IEFs were also considered to potentially include designated sites for nature conservation which support important bird populations, such as SPAs (internationally important sites classified for the conservation of birds listed in Annex I of the Birds Directive¹, as well as regularly occurring migratory species not listed in Annex I) and Ramsar sites, as well as other internationally important sites, such as Special Areas of Conservation (SACs), where considered to be of importance for birds.

2.6.1 Determining Sensitivity of Bird Species Selected as IEFs

The sensitivity of a species can be defined as its ecological importance and nature conservation interest at the site being assessed (Percival, 2003). Methodology outlined in Percival (2003) was used to evaluate the sensitivity of those bird species selected as IEFs. This guidance outlines a number of factors used to determine sensitivity:

- Whether the species is listed on Annex I of the EU Birds Directive

¹ 2009/147/EC

- Whether the species is particularly ecologically sensitive – this includes large birds of prey and rare breeding birds (including divers, common scoter, hen harrier, golden eagle, chough etc)
- Whether the site contains populations of species considered to be of international/national importance (>1% of Irish population)
- Whether the site contains populations of species considered to be of regional importance (>1% of regional population, taken at be at the County level)
- Whether the species is subject to special conservation measures, such as red or amber listed species on the Birdwatch Ireland’s list of Birds of Conservation Concern in Ireland (BOCCI).

Table 12 below presents the criteria used to evaluate the sensitivity of a species, as per Percival (2003).

Table 12. Evaluation of the sensitivity of bird species (adapted from Percival, 2003)

Sensitivity	Determining Factor
Very High	Species that form the cited interest of SPAs and other statutorily protected nature conservation areas. Cited means mentioned in the citation text for the site as a species for which the site is designated.
High	Species that contribute to the integrity of an SPA, but which are not cited as species for which the site is designated. Ecologically sensitive species including the following: divers, common scoter, hen harrier, golden eagle, red necked phalarope, roseate tern and chough. Species present in nationally important numbers (>1% Irish population)
Medium	Species on Annex 1 of the EU Birds Directive. Species present in regionally important numbers (>1% regional (county) population). Other species on BirdWatch Ireland’s red list of Birds of Conservation Concern.
Low	Any other species of conservation interest, including species on BirdWatch Ireland’s amber list of Birds of Conservation Concern not covered above.

2.7 Impact Assessment Methodology

Significance is a concept related to the weight that should be attached to effects when decisions are made (CIEEM, 2019). A significant effect is an effect that undermines either the long-term distribution or abundance of bird populations, at the appropriate geographical scale (locally, regionally, or in the case of rare and restricted species, nationally (Drewitt and Langston (2006)), or the conservation objectives of a designated site (NRA, 2009; CIEEM, 2019).

Ecological impacts and effects were characterized using EPA (2022) guidance and criteria for characterising ecological impacts.

Table 13. Criteria for assessing impacts based on EPA (2022)

Parameter	Description
Quality	Positive effects: A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral effects: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse effects: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Parameter	Description
Extent	The size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Whether the extent, duration or frequency will conform or contrast with established (baseline) conditions
Duration	<ul style="list-style-type: none"> • Momentary – effects lasting from seconds to minutes • Brief – effects lasting less than a day • Temporary – effects lasting less than a year • Short-term – effects lasting 1 to 7 years • Medium term – effects lasting 7 to 15 years • Long term – effects lasting 15 to 60 years • Permanent – effects lasting over 60 years • Reversible – effects that can be undone • Frequency – how often effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the significance of effects (EPA, 2022)	Imperceptible An effect capable of measurement but without significant consequences.
Describing the significance of effects (EPA, 2017)	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound An effect which obliterates sensitive characteristics

2.7.1 Collision Risk Assessment

A collision risk model was undertaken separately by MKO for thirteen species of conservation concern:

- Buzzard
- Golden Plover
- Great Black-backed Gull
- Grey Heron
- Hen Harrier
- Kestrel
- Lesser Black-backed Gull
- Mallard
- Merlin

- Peregrine
- Snipe
- Sparrowhawk
- Whooper Swan

The collision risk assessment was based on vantage point surveys undertaken at the wind farm site from April 2019 to March 2023, inclusive. This represents a 48-month survey period, consisting of four breeding seasons and four winter seasons. Surveys were undertaken from six fixed vantage points² (VP1, VP2, VP3, VP4, VP5 & VP7).

The Band Collision Risk Model (Band *et al.*, 2007) was used in this assessment. The Band Model is used to predict the number of bird collisions that might be caused by a wind farm development. It uses species-specific information on bird biometrics, flight characteristics and the expected amount of flight activity, along with the number and layout of turbines and turbine specifications such as hub height, rotor diameter, pitch and rotational speed to estimate the risk of collision.

The Band modelling method involves two stages:

Stage 1: Estimating the number of birds or flights that pass through the air space swept by the turbine rotors. These transits are calculated by using either the “Regular or Random flight” model depending on flight distribution and behaviour.

Stage 2: Calculating the probability of a bird being struck (collision risk) when making a transit through a rotor.

The figures obtained in both stages are then multiplied together to give a theoretical annual collision mortality rate based on the supposition that birds make no attempt to avoid collision. However, in “real-life” circumstances, birds demonstrate high rates of avoidance - usually 98-99% according to SNH (2018). To account for these evasion measures, known avoidance rates are applied as a percentage to the theoretical collision value as a final step.

Band Model values are theoretical predictions and draw conclusions by assuming likely levels of active avoidance by specific species. Accordingly, results obtained are dependent on the quality of field observation data and accuracy of the avoidance rates used and must therefore be interpreted with a certain degree of caution.

Further information can be found in the Collision Risk Assessment prepared by MKO for the proposed wind farm development (see **Appendix 15**).

2.8 Mitigation

Where potentially significant effects on IEFs are predicted, mitigation has been prescribed to avoid, reduce and/or remove such effects.

Proposed best practice design and mitigation measures are specifically set out and are realistic in terms of cost and practicality. They have been subject to detailed design and will effectively address the effects on the identified IEFs.

The potential effects of the proposed wind farm development were considered and assessed to ensure that all effects on IEFs are adequately addressed, and no significant residual effects are likely to remain following the implementation of mitigation measures/best practice.

² Note that VP6 does not cover any of the proposed turbine locations and was therefore omitted from the collision risk analysis.

2.9 Statement on Limitations and Difficulties Encountered

2.9.1 COVID-19 Restrictions and Implications for Survey Effort in 2020

Scheduling and resourcing of bird surveys during the very end of the 2019/20 winter season and the very start of the 2020 breeding season survey periods were significantly constrained due to Covid 19 government restrictions with regards to work, travel and booking overnight accommodation, and the resulting knock-on field survey implications.

Due to Covid-19 restrictions, no field surveys were completed at the site in April 2020. When fieldwork resumed in May 2020, VP surveys were prioritised over other breeding season surveys given the time constraints imposed on completion of fieldwork by the restrictions and considering the heavily afforested nature of the site and thus potentially lower value to target species relative to areas not used for commercial timber production.

VP surveys were undertaken twice in May 2020 to account for VP surveys missed in April. There were no impacts on VP surveys for the remainder of the 2020 breeding season. However, the prioritisation of VP surveys in May had knock-on effects on the completion of other 2020 breeding season surveys (see **Section 2.9.3** and **2.9.4**, below).

Due to the limitations imposed by Covid-19 travel restrictions in place in spring 2020, as outlined above, a precautionary approach has been taken with regard to data collected during the 2020 breeding season. This is in line with recommendations contained within the CIEEM guidance document '*Guidance on Ecological Survey and Assessment in the Republic of Ireland and Northern Ireland during the Covid-19 Outbreak*' (CIEEM, 2020). The 2021 and 2022 breeding season survey periods were unaffected with regards to Covid-19 restrictions and were thus unaffected in terms of data collection as part of VP and distribution and abundance surveys.

2.9.2 Change to Proposed Site Boundary/Increase in Size of Proposed Development Site

Large areas encompassed within the southern section of the current proposed wind farm site boundary were added at a later stage in the project. This information, in the form of an updated wind farm site boundary map, was relayed to MWP after MWP's involvement in bird surveys at the site had ceased (as of March 2023). The bird surveys undertaken by MWP were therefore based on the original site boundary which was smaller in extent. Implications for surveys undertaken are discussed further in **Section 2.9.3** and **2.9.4** below.

2.9.3 Vantage Point Surveys

- Efforts were made to ensure that the most appropriate VP locations were selected, as per SNH. VPs were selected to maximise coverage of the site on the basis of the wind farm site boundary under consideration at the time.
- All of the proposed turbine locations are covered by the existing VP viewsheds (see **Appendix 2**).
- The percentage of the current proposed wind farm site not covered by the 7 No. VP viewsheds is 8%. It is often difficult to get full VP viewshed coverage of a site. Factors which influenced the extent of viewshed coverage included the change in site boundary (see **Section 2.9.2** above and discussed further below) and to a lesser extent topography and the extent of forestry cover, which constrained viewshed coverage of the site in certain minor areas.
- In the case of the very south-western corner of the site and south-central section of the site, the boundary change (discussed in **Section 2.9.2**, above) has subsequently resulted in the current proposed wind farm site boundary extending beyond the original extent of viewshed coverage.

- However, the additional areas added along the former southern boundary of the site are largely encompassed within the existing VP viewsheds, as follows:
 - the additional area in the south-west corner is largely covered by VP1.
 - the additional area in the south-central section is largely covered by VP1, VP2, VP3, VP4 and VP7.
 - the additional area in the south-eastern corner is covered by VP4, VP5 and VP7.
- The extent of VP viewshed coverage is considered sufficient so as to have allowed for the capture of adequate flight data with regard to the impact assessment and the collision risk assessment which has been undertaken.
- SNH (2017) stipulates that where VPs are located within the survey area, they should not be used simultaneously with other VP's which overlook them to minimise potential observer effect on bird behaviour. VP6 overlooks VP2 and VP7 overlooks VP3. There was a minor degree of overlap in timing between some of the VP survey watches undertaken at these VPs. For example, VP6 and VP2, and VP7 and VP3 were undertaken simultaneously on a total of 3 dates and 7 dates respectively over the course of the 4-year survey period.
- Regarding the number of VP hours achieved at each VP location during the survey period, the minimum required hours per year, as per SNH (2017) were not achieved in Year 1 (April 2019 to March 2020) and Year 4 (April 2022 to March 2023) with a minor shortfall of 2 hours and 6 hours for each year's total VP hours, respectively (see **Appendix 3**). These minor shortfalls in number of VP survey hours are not considered to have affected the quality of the flight data captured in the context of the overall volume of data obtained and number of VP survey hours completed on-site.

2.9.4 Breeding Season Distribution and Abundance Surveys

2.9.4.1 Breeding Season Transects and Walkovers

Table 14. Summary of Breeding Season Transect and Walkover Surveys Spatial and Temporal Coverage

Breeding Season	Summary
2019	In addition to monthly transects within the proposed wind farm site, a walkover of the open bog located within the 500 m survey area buffer to the north and west, was undertaken once in mid-July, with a focus on red grouse, merlin and other raptors, golden plover and other moorland breeding species such as snipe.
2020	Completion of the 2020 breeding season distribution and abundance surveys was constrained due to knock-on implications arising from Covid-19, as outlined in Section 2.9.1 above. For example, April 2020 transect surveys were completely missed. Monthly transects were therefore undertaken twice in May to make up for missing April. Only one breeding walkover survey was undertaken at the site in May 2020, primarily located within the 500 m site buffer; however, this survey encompassed an additional walkover route, encompassing open bog to the east/north-east of the site, as well as to the north and west, which provided greater coverage of potentially suitable breeding habitat for breeding target species. The 2020 breeding season walkovers encompassed the majority of open bog within the 500 m survey area buffer (excluding an area to the east of the site excluded due to H&S reasons).
2021	In addition to bi-monthly transects within the proposed wind farm site (undertaken in April, June and August 2021), walkovers of the majority of open bog encompassed within the 500 m survey area were undertaken twice in mid- to late July, utilising the same walkover routes as for 2020.
2022	In addition to the transects within the proposed wind farm site (undertaken in June, July and September 2022), walkovers of the majority of open bog encompassed within the 500 m survey area buffer were undertaken twice (mid-June and late August), utilising the same walkover routes as for 2020 and 2021.

Spatial Coverage Rational and Constraints

Any apparent reduced extent of site coverage for breeding season walkover surveys has primarily been influenced by the subsequent change to the proposed wind farm site boundary, as discussed above in **Section 2.9.2**.

At the time of the 2019 to 2022 breeding surveys, the proposed wind farm site boundary was surrounded by a much greater degree of forestry in contrast to the current proposed wind farm site boundary. This was a critical factor in the selection of the 500 m survey area buffer walkover routes used for the 2019 to 2022 breeding seasons in terms of potential habitat suitability for target species.

The 2019 to 2022 breeding season walkover surveys encompassed the vast majority of open bog and moorland habitat which surrounded the site at the time. The areas of open bog to the south-west, south and south-east of the current proposed wind farm site boundary were not encompassed within the 500 m buffer area at the time of the 2019 to 2022 breeding surveys. These areas were partially encompassed within VP viewsheds (to the south and south-east); however, this limitation in coverage may mean that breeding birds may have been under-recorded in these areas.

With regard to breeding waders and wildfowl, at the time of these surveys, the proposed wind farm site comprised predominantly commercial forestry plantation with no permanent lakes or ponds present. Any standing water occurring would have been restricted to temporary/ephemeral standing water which may have been present within parts of the site on occasion. Therefore, it is noted that, at the time of surveys, the habitats encompassed within the proposed wind farm site boundary under consideration at the time were considered to be of limited use to breeding and/or foraging/roosting wader and wildfowl species.

It is noted that the lakes and permanent ponds located within the southern sections of the current proposed wind farm site e.g., Altderg Lough, are situated within the additional areas of land which were subsequently incorporated into the proposed site boundary. This limitation in coverage may mean that breeding birds may have been under-recorded in these areas.

Temporal Coverage Constraints

In terms of survey timings and frequency, SNH (2017) recommends an adapted Brown and Shepherd (1993) survey method for moorland breeding birds. This requires four survey visits spaced at least seven days apart which should cover the whole breeding season between mid-April and early July. With regard to this specific survey methodology, the 2019 to 2022 breeding walkover surveys undertaken within the 500 m survey area buffer were significantly constrained as they were undertaken outside this core recommended breeding period and/or were limited in terms of the number of survey visits achieved.

In relation to the area encompassed within the proposed wind farm site, data from a total of 36 monthly transects has been gathered from this area. With regard to breeding waders and wildfowl potentially occurring within the site, late winter and all summer transects undertaken within this area, completed on a monthly basis for the first two years of survey (and encompassing the key breeding survey periods of April to July), and then on a bi-monthly basis for the following two full years of survey, would have contributed to the capture of data on waders and wildfowl potentially breeding within the area, although the habitats occurring were considered of limited value to these species. The timing of some breeding season abundance and distribution surveys, such as the early 2022 breeding season transects, were affected by factors such as inclement weather, which resulted in no transect surveys being undertaken within the proposed wind farm site at the start of the 2022 breeding season (in either April or May 2022).

Due to the temporal and spatial limitations of the breeding season distribution and abundance surveys, in particular the breeding walkover surveys undertaken within the 500 m survey area buffer, a precautionary approach has been taken with regard to results for wader and wildfowl species

2.9.4.2 Breeding Raptor Surveys

With regard to breeding raptors, Hardey *et al.*, (2013) recommends that for species such as kestrel, merlin and sparrowhawk a total of four survey visits should be made throughout the breeding season in line with a specific survey schedule to capture key periods. However, if time is limited and a home range appears to be unoccupied on the basis of the first two visits, then further visits to that home range can be omitted for kestrel and merlin. Four visits are still recommended for sparrowhawk (Hardey *et al.*, 2013).

Targeted breeding raptor surveys in line with Hardey *et al.* (2013) were not undertaken within the proposed wind farm site or within a 2 km radius of the site.

Instead, breeding season walkover surveys encompassing the open bog located within the 500 m survey area buffer and targeting merlin and other raptors, as well as breeding waders, were undertaken during the 2019 to 2022 breeding season survey periods; however, these were limited in terms of frequency and the recommended survey timings.

With regard to forested areas within the proposed wind farm site boundary, comprising potentially suitable habitat for breeding raptors, although not in accordance with the specific recommended breeding raptor survey methodology outlined above, transects, encompassing both open and closed habitats, were undertaken monthly during the 2019 and 2020 breeding seasons survey (and encompassed the key breeding survey periods of April to July), and regularly during the 2021 and 2022 breeding seasons. These would have contributed to the capture of data on breeding raptors potentially occurring within the proposed wind farm site.

VP surveys, undertaken monthly over the four breeding season survey periods (2019 to 2022) would also have contributed to the capture of data on breeding raptors, where present, both within the closed forestry and more open areas within the proposed wind farm site and within the open bog, moorland and forestry encompassed within the 500 m survey area buffer surrounding the site at the time.

Due to the temporal and spatial limitations outlined above, and the associated potential for breeding raptors to have been under-recorded, a precautionary approach has been taken with regard to breeding raptor results.

2.9.4.3 Nocturnal Breeding Surveys

Spatial Coverage Rational

The 2019, 2021 and 2022 nocturnal breeding surveys, which utilised the existing internal forestry access road network, covered the majority of suitable woodcock breeding habitat encompassed within the proposed wind farm site boundary which was under consideration at the time of the surveys. Due to H&S reasons, it was not considered feasible to survey forested areas which were not readily accessible on foot via existing access tracks.

As discussed in **Section 2.9.2** above, large areas in the south of the current proposed wind farm site, comprising mainly forestry and suitable woodcock breeding habitat, were added at a later stage.

Temporal Coverage Constraints

Surveys for breeding woodcock were limited to two visits (June and August) in 2019, and one visit in June in both 2021 and 2022. This comprises a reduced survey effort relative to that outlined in Gilbert *et al.* (1998), which recommends three visits per breeding season (between May and June).

It is noted that all records and/or incidental sightings of woodcock over the 4-year survey period comprised winter season records only. Woodcock was not recorded at any stage during either targeted nocturnal or non-targeted surveys during the 2019, 2020, 2021 or 2022 breeding seasons. However, due to the temporal and spatial limitations outlined above with regard to the targeted nocturnal surveys undertaken, and the associated potential for breeding woodcock to have been under-recorded, a precautionary approach has been taken with regard to breeding woodcock results.

3. Existing Environment

3.1 Site Description

The proposed wind farm site (BIAR site) is located in northwest County Mayo, approximately 6.2 km southwest of Ballycastle and 17 km northwest of Crossmolina. The proposed wind farm site encompasses the townlands of Altderg in the south-west, Lugnalettin in the north-west, Glenora in the north-east, and Ballykinlettragh and Keerglen in the south-east.

The proposed wind farm site principally consists of conifer plantation of varying age profiles including clear-fell, pre- and post-thicket phases and mature closed canopy. Internal forestry access roads are located throughout the site. Areas of upland heath/bog habitat are also encompassed within the site, predominantly in peripheral areas, and extending away from the site, primarily to the north, west, east and south-east. Such habitats are representative of the habitats and landscape character that pertained prior to the development of forestry in the area.

According to the CORINE (Co-Ordinated Information on the Environment) data series (last updated 2018), land cover on the site comprises of 'Transitional woodland scrub (324)', 'coniferous forests (312)' and 'peat bogs (412)' in the surrounding area³. A review of the Teagasc map viewer determined that soil composition throughout the site comprises 'peat'⁴.

The site lies within the Blacksod-Broadhaven catchment. The majority of the site to the west lies within the Owenmore [Mayo] sub-catchment. The south-eastern section lies within the Glencullin [North Mayo] sub-catchment. The site is primarily drained by an unnamed stream (IE_WE_33O040050) to the southwest which flows into the River Owenmore. A number of 1st order streams drain the south-eastern section of the site to the Keerglen River.

3.2 Desktop Study

3.2.1 Other Wind Farm Developments

A search was undertaken for other wind farm projects with which the proposed wind farm development could potentially interact to result in cumulative impacts to avian receptors. The following table outlines operational, permitted and proposed wind farm projects located within a 20 km radius of the proposed wind farm.

Table 15. Wind farms located within a 20 km radius

Wind Farm	No. Turbines	Distance	Status
ABO Sheskin	8	5-10 km	Under construction since February 2022
Oweninny 1	29	5-10 km	Operational
Oweninny 3	18	5-10 km	Proposed
Bellacorrick	21	5-10 km	Operational
Sheskin South	21	5-10 km	Proposed
Oweninny 2	25	10-15 km	Operational
Killala	6	10-15 km	Existing
Kilsallagh	13	15-20 km	Proposed

³ <https://gis.epa.ie/EPAMaps/>

⁴ <http://gis.teagasc.ie/soils/map.php>

There are two other wind farms located in the area surrounding the proposed wind farm site; Keerglen Wind Farm, located directly south of the proposed wind farm location, and Tirwaley Wind farm, located 5-10 km from the proposed wind farm location. Both projects are at design stage and no additional information is available.

3.2.2 Natura 2000 Designated Sites

3.2.2.1 Special Protection Areas (SPAs)

The EU Birds Directive requires Member States to designate legally protected areas for the conservation of endangered or migratory species of bird, as listed on Annex I of the Directive. These areas are known as Special Protection Areas (SPAs) and, since 1994, all SPAs form part of the Natura 2000 network of protected sites. The EU Birds Directive is implemented in Irish law under the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

An on-line search for SPAs within the greater area surrounding the proposed wind farm site was carried out to identify any potential for 'connectivity' between the site and SPAs by assessing whether pathways exist through which the proposal could impact on certain qualifying interest species, as recommended in the guidance document 'Assessing Connectivity with Special Protection Areas (SPAs)' (SNH, 2016). Within this SNH document, core foraging ranges from nest-sites and roost-sites are published for both the breeding and winter seasons for the bird species frequently encountered when considering wind farm development proposals. SNH recommends that typically the core foraging range should be used when determining whether there is connectivity between the proposal and qualifying interest species. Core foraging ranges for wind farm sensitive species can range from <5 km to up to 20 km, in the case of certain wide-ranging species of geese in the winter season (SNH, 2016).

Therefore, an on-line search for SPAs located within 20 km of the proposed wind farm development was carried out. This search determined that there are six SPAs within 20 km, as outlined in **Table 16** and **Figure 3** below.

Table 16. SPAs within a 20 km radius of the proposed wind farm development (BIAR Site Boundary)

Designated Site	Distance from BIAR Site Boundary	Special Conservation Interests (SCIs)
Killala Bay/Moy Estuary SPA (004036)	10.3 km	<ul style="list-style-type: none"> • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Sanderling (<i>Calidris alba</i>) [A144] • Dunlin (<i>Calidris alpina</i>) [A149] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Wetland and Waterbirds [A999]
Illanmaster SPA (004074)	10.9 km	<ul style="list-style-type: none"> • Storm Petrel (<i>Hydrobates pelagicus</i>) [A014]
Owenduff/Nephin Complex SPA (004098)	13.4 km	<ul style="list-style-type: none"> • Merlin (<i>Falco columbarius</i>) [A098] • Golden Plover (<i>Pluvialis apricaria</i>) [A140]
Blacksod/Broad Haven Bay SPA (004037)	14.4 km	<ul style="list-style-type: none"> • Red-throated Diver (<i>Gavia stellata</i>) [A001] • Great Northern Diver (<i>Gavia immer</i>) [A003] • Slavonian Grebe (<i>Podiceps auritus</i>) [A007] • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] • Common Scoter (<i>Melanitta nigra</i>) [A065] • Red-breasted Merganser (<i>Mergus serrator</i>) [A069] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Sanderling (<i>Calidris alba</i>) [A144] • Dunlin (<i>Calidris alpina</i>) [A149] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]

Designated Site	Distance from BIAR Site Boundary	Special Conservation Interests (SCIs)
		<ul style="list-style-type: none"> • Curlew (<i>Numenius arquata</i>) [A160] • Sandwich Tern (<i>Sterna sandvicensis</i>) [A191] • Dunlin (<i>Calidris alpina schinzii</i>) [A466] • Wetland and Waterbirds [A999]
Carrowmore Lake SPA (004052)	16.4 km	<ul style="list-style-type: none"> • Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]
Lough Conn and Lough Cullin SPA (004228)	18.2 km	<ul style="list-style-type: none"> • Tufted Duck (<i>Aythya fuligula</i>) [A061] • Common Scoter (<i>Melanitta nigra</i>) [A065] • Common Gull (<i>Larus canus</i>) [A182] • Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] • Wetland and Waterbirds [A999]

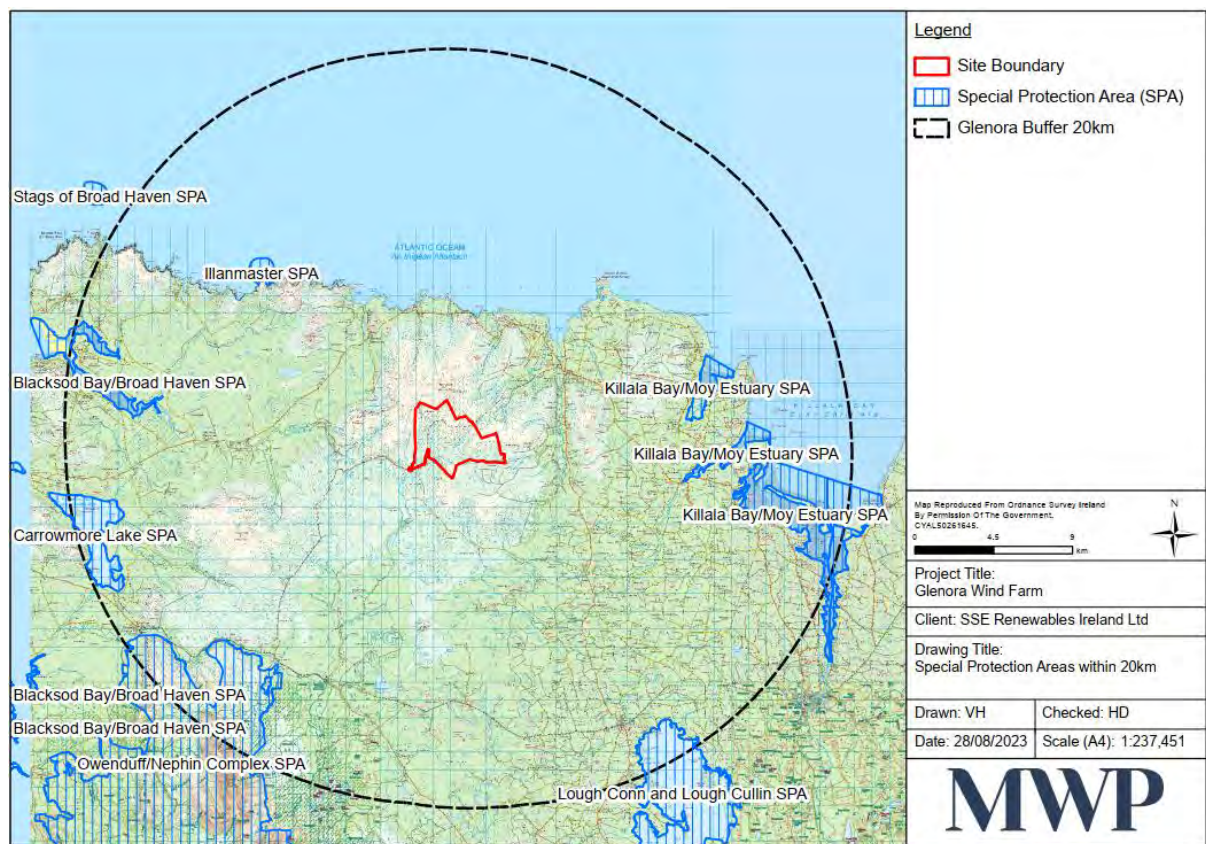


Figure 3. SPAs located within 20 km radius of the proposed wind farm site (BIAR Site)

3.2.2.2 Special Areas of Conservation (SACs)

Although not designated for qualifying bird species, Special Areas of Conservation (SACs) can provide important habitats that support bird populations which are of conservation concern, and which have the potential to be impacted by the proposal. On a precautionary basis, it was therefore decided to include SACs considered to be of importance for bird species and not encompassed within SPAs as part of the desk-top search for designated sites within the potential ZOI of the proposal.

An on-line search of SACs within a 20 km radius of the proposed wind farm development was carried out. SAC site synopses, and other information gathered as part of the desk-top study, was reviewed. SACs identified to be of ornithological importance as part of this review have been included in **Table 17** and shown in **Figure 4** below,

Table 17. SACs of ornithological interest (not encompassed within SPAs) located within a 20 km radius of the proposed wind farm development (BIAR Site)

Designated Site	Distance from BIAR Site Boundary	Ornithological relevance (based on desk-top study)
Glenamoy Bog Complex SAC (000500)	150 m north of site's northern boundary.	Of importance for: <ul style="list-style-type: none"> Variety of breeding seabird species Breeding peregrine (<i>Falco peregrinus</i>), chough, merlin and golden plover Wintering barnacle goose (<i>Branta leucopsis</i>)
Slieve Fyagh Bog SAC (000542)	7.7 km	Of importance for: <ul style="list-style-type: none"> Breeding golden plover, dunlin and redshank (<i>Tringa tetanus</i>)
Carrowmore Lake Complex SAC (000476)	11 km	Of importance for: <ul style="list-style-type: none"> Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>) (sub-flock of the nationally important Bog of Erris flock) Breeding merlin, golden plover, Arctic tern (<i>Sterna paradisaea</i>), sandwich tern, common gull (<i>Larus canus</i>) Tufted duck (<i>Aythya fuligula</i>), pochard (<i>Aythya farina</i>), wigeon (<i>Anas penelope</i>), goosander (<i>Mergus merganser</i>)

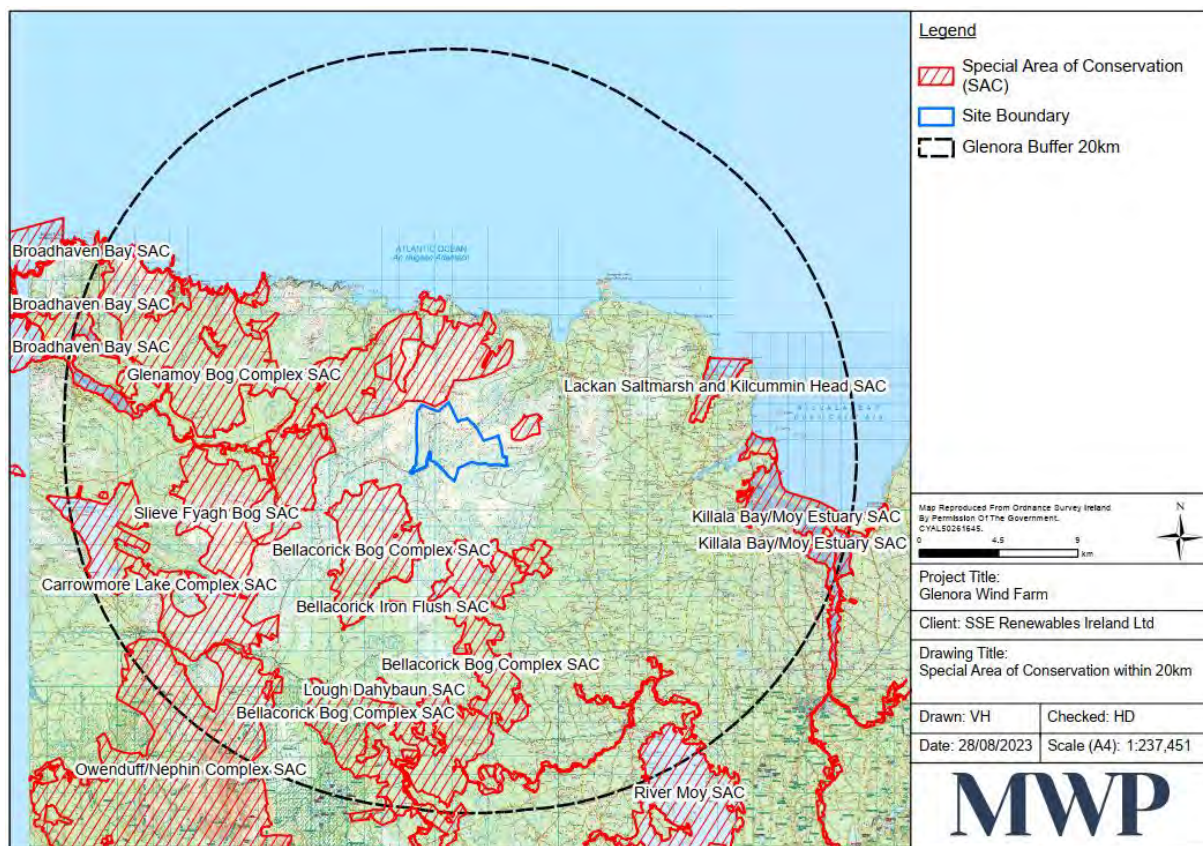


Figure 4. SACs within a 20 km radius of the proposed wind farm site (BIAR Site)

3.2.3 Nationally Designated Sites

Two Natural Heritage Areas (NHAs) adjoin the proposed wind farm site, as follows (with listed species of conservation importance from site synopses):

- Inagh Bog NHA (code 002391) – adjoins the western boundary, with breeding populations of golden plover and red grouse;
- Ummerantarry Bog NHA – adjoins the southern boundary, with breeding populations of golden plover (with baseline surveys confirming red grouse also present).

3.2.4 Ramsar Sites/Important Bird and Biodiversity Areas (IBAs)

The Convention on Wetlands, also known as the Ramsar Convention, is an intergovernmental treaty which aims to conserve and protect wetlands and their resources around the world⁵. It was ratified by Ireland in 1984 and came into force on 15th March 1985. While this convention is not legislation, it is an international treaty. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 hectares.

The desk-top review concluded that there are three Ramsar sites within 20 km of the proposed wind farm site: 'Knockmoyle/Sheskin', located approximately 3.5 km to the south-west, 'Owenboy', located approximately 13.6 km to the south and 'Killala Bay/Moy Estuary', located approximately 13.3 km to the east.

The Important Bird and Biodiversity Areas (IBAs) Programme, overseen by Birdlife International, aims to identify, conserve and protect those areas throughout the world considered to be of the greatest significance to bird populations⁶. The desk-top review concluded that there are three IBA sites within 20 km of the proposed wind farm site boundary: 'Killala Bay'⁷, located approximately 10.6 km to the east, 'Owenduff River Catchment and Nephin Beg'⁸, located approximately 13.4 km to the south-west, and 'Broadhaven, Blacksod and Tullaghan Bays and parts of the Mullet Peninsula'⁹, located approximately 13.6 km to the north-west.

3.2.5 I-WeBS Sites

I-WeBS (Irish Wetland Bird Survey) is a joint project between BirdWatch Ireland and the National Parks and Wildlife Service (NPWS) in which specific wetland sites are surveyed (BirdWatch Ireland, 2019). In order to count the wetland birds, a 'look-see' method (Bibby *et al*, 2000) is used in which all birds present within a pre-defined area are counted. The aim of these surveys is to monitor non-breeding birds in Ireland and contribute to population counts. The information is also important to help assess the quality of these wetland areas. The bird groups to be counted for I-WeBS consist of swans and geese, ducks, divers, waders and gulls. Counts are made once per month from September to March annually (BirdWatch Ireland, 2019)¹⁰.

The proposed wind farm site is not located within, or near, any I-WeBS site. The nearest I-WeBS site is located at Killala Bay, approximately 10.3 km to the east. There are a total of four I-WeBS sites situated within 20 km of the proposed wind farm site (see **Table 18** below).

⁵ <http://www.ramsar.org/>

⁶ <http://www.birdlife.org/worldwide/programmes/important-bird-and-biodiversity-areas-ibas>

⁷ <http://datazone.birdlife.org/site/factsheet/killala-bay-iba-ireland/map>

⁸ <http://datazone.birdlife.org/site/factsheet/662.0>

⁹ <http://datazone.birdlife.org/site/factsheet/570.0>

¹⁰ <https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/>.

Table 18. I-WeBS sites within 20 km of the proposed wind farm site (BIAR Site)

I-WeBS Site	Proximity to BIAR Site
Killala Bay (Site code – OD486)	10.3 km east of the site
Broadhaven & Sruwaddacon Bays (Site code – OD475)	14.7 km west of the site
Carrowmore Lake (Site code – OD062)	16.6 km west of the site
Lough Conn (Site code – OD517)	18.2 km south-east of the site

There are a total of 35 I-WeBS sites located in County Mayo, as follows. Birdwatch Ireland data from these I-WeBS sites can be used to estimate county populations of wintering waterbirds.

- Achill Island
- Attymass Lake
- Balla Wetlands
- Ballybackagh
- Ballyglass Wetlands
- Ballyhaunis Lakes
- Blacksod & Tullaghan Bays
- Brees Wetlands
- Broadhaven & Sruwaddacon Bays
- Callows Lakes
- Carrowmore Beach
- Carrowmore Lake
- Carrownacon Lakes
- Cashel Turlough
- Castlebar Lakes/Islandeady Chain
- Clew Bay
- Keel Lough
- Kilglassan Turlough/Greaghans
- Killala Bay
- Knappaghbeg Lough
- Lough Conn
- Lough Cullin
- Lough Levally
- Lough Mask
- Lough Muck (Mayo)
- Lough Nahaltora
- Manulla Lakes
- Mullet West
- River Moy
- Rostaff Lake

- South Mayo Coast
- Tawnyard Lough
- Termoncarragh & Annagh Marsh
- Washpool Lough
- Wetland near Drumcarrabaun (Belcarra/Ballyglass Road)

Datasets for the above I-WeBS sites were downloaded from www.birdwatchireland.ie by MKO in January 2023 and reviewed by MKO as part of their desk-top study. Summary tables for the species recorded at each of these I-WeBS sites during the most recent 5-season survey period available (2016/17 to 2020/21) were reviewed and used to calculate mean counts for wintering species within the county (see **Section 3.4** below).

The following I-WeBS sites did not have any data for the survey period 2016/17 to 2020/21:

- Keel Lough
- Kilglassan Turlough/Greaghans
- Knappaghbeg Lough
- Lough Muck (Mayo)
- Lough Nahaltora
- River Moy
- Tawnyard Lough

3.2.6 BirdWatch Ireland Bird Sensitivity Tool

A Bird Sensitivity Mapping Tool for wind energy development was developed by BirdWatch Ireland and provides a measured spatial indication of where protected birds are likely to be sensitive to wind energy developments. The tool can be accessed via the National Biodiversity Data Centre Website (www.biodiversityireland.ie) and is accompanied by a guidance document (McGuinness *et al.* (2015)). The criteria for estimating a zone of sensitivity (i.e., 'low', 'medium', 'high' and 'highest') is based on a review of the behavioural, ecological and distributional data available for each species.

The southernmost section of the proposed wind farm site lies partially within a zone of medium sensitivity for golden plover and red grouse, and a zone of low sensitivity for red grouse. These zones also encompass the lands extending south from the site boundary. Additionally, there is minor overlap between the south-eastern and north-western corners of the site with other zones of low sensitivity for red grouse. Please see **Figure 5** below.

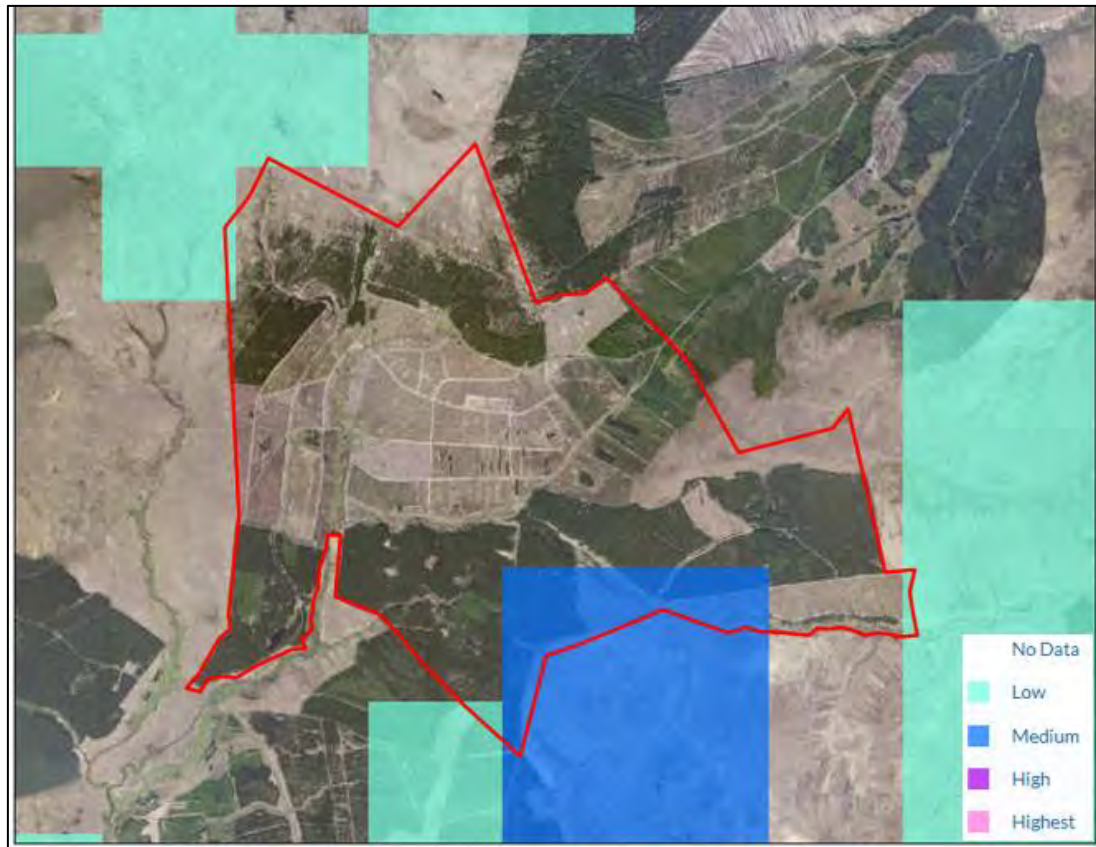


Figure 5. Proposed wind farm site boundary (BIAR Site) in the context of Bird Sensitivity Mapping as per tool available on the NBDC website (Adapted from <https://maps.biodiversityireland.ie/Map>)

3.2.7 Bird Atlas Records and Distribution

'Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland' (Balmer *et al.*, 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland. Previous Bird Atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- Sharrock, J.T.R. (1976) The atlas of breeding birds in Britain and Ireland.
- Lack, P.C. (1986) The atlas of wintering birds in Britain and Ireland.
- Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991.

The proposed wind farm site lies within the hectad G03. **Table 19** below presents Breeding Bird Atlas data for potential target species previously recorded within this hectad. **Table 20** below presents Wintering Bird Atlas data for potential target species previously recorded within this hectad. The full list of all bird species which have been previously recorded in the hectad, including their conservation and protection status in an Irish and European context and their most recent Bird Atlas wintering and breeding status, is provided in **Appendix 13**.

Table 19. Breeding Bird Atlas data (G03) with breeding status¹¹

Species Name	Breeding Atlas (68-72)	Breeding Atlas (88-91)	Breeding Atlas (07-11)	Conservation Status ¹²
Corncrake (<i>Crex crex</i>)	Probable	-	-	BD, RL
Golden Plover (<i>Pluvialis apricaria</i>)			Probable	BD, RL, SCI
Kestrel (<i>Falco tinnunculus</i>)	Probable	Seen	Confirmed	RL
Red Grouse (<i>Lagopus lagopus</i>)	Probable	-	Probable	RL
Ringed Plover (<i>Charadrius hiaticula</i>)	Confirmed	-	-	AL, SCI
Snipe (<i>Gallinago gallinago</i>)	Probable	-	-	RL
Sparrowhawk (<i>Accipiter nisus</i>)	Possible	-	Possible	GL, Schedule IV

Table 20. Wintering Bird Atlas data (G03) with wintering status

Species Name	Wintering Atlas (81-84)	Wintering Atlas (07-11)	Conservation Status
Bar-tailed Godwit (<i>Limosa lapponica</i>)	-	Present	BD, RL, SCI
Curlew (<i>Numenius arquata</i>)	Present	Present	RL, SCI
Golden Plover (<i>Pluvialis apricaria</i>)	Present	Present	BD, RL, SCI
Great Northern Diver (<i>Gavia immer</i>)	Present	-	BD, RL, SCI
Hen Harrier (<i>Circus cyaneus</i>)	-	Present	BD, AL
Kestrel (<i>Falco tinnunculus</i>)	Present	Present	RL
Merlin (<i>Falco columbarius</i>)	-	Present	BD, SCI, AL
Oystercatcher (<i>Haematopus ostralegus</i>)	Present	Present	RL
Purple Sandpiper (<i>Calidris maritima</i>)	Present	-	RL
Red Grouse (<i>Lagopus lagopus</i>)	-	Present	RL
Redshank (<i>Tringa totanus</i>)	Present	Present	RL
Red-throated Diver (<i>Gavia stellata</i>)	Present	-	BD, SCI, AL
Ringed Plover (<i>Charadrius hiaticula</i>)	-	Present	SCI, AL

¹¹ Breeding status: Seen = recorded; Possible = possible breeding; Probable = probable breeding; Confirmed = confirmed breeding; - = not recorded; Non-B = non-breeding; Breed = breeding

¹² Conservation Status: BD = Annex I of the Birds Directive; RL = BoCCI Red-listed; SCI = Special Conservation Interest species of nearby SPA; Schedule IV = protected under Schedule IV of the Wildlife Act

Species Name	Wintering Atlas (81-84)	Wintering Atlas (07-11)	Conservation Status
Sanderling (<i>Calidris alba</i>)	Present	Present	SCI, GL
Snipe (<i>Gallinago gallinago</i>)	Present	Present	RL
Woodcock (<i>Scolopax rusticola</i>)	-	Present	RL

3.2.8 Previous Bird Records for the Wider Area

As part of the desktop study, a detailed review of other previous bird records for the wider area, such as for other wind farm developments, as available on-line and/or in published sources, was undertaken.

There are no other wind farm developments existing or proposed within a 5 km radius of the proposed wind farm site (please refer to **Section 3.2.1** above). The previous bird records which were available for the wider area extending beyond this radius are summarised as follows.

As part of the desk-top study, a review was carried out of the report ‘Breeding bird populations on the Oweninny cutaway peatlands, County Mayo’ (Copland *et al.*, 2011) which pertained to 2009 surveys of rehabilitating cutover bog at Bellacorick, Co. Mayo, located approximately 6 km south of proposed wind farm site. A summary of the bird survey results is given as follows. More detailed information can be found in Copland *et al.*, (2011). Annex I species recorded included a single dunlin (believed likely to have been a failed or non-breeder) and a golden plover (probable breeding). Teal (*Anas crecca*) and kestrel were recorded as probable breeding species., while snipe and common sandpiper (*Actitis hypoleucos*) were recorded as possible breeding species. Little grebe (*Tachybaptus ruficollis*) (1 pair), ringed plover (1 pair confirmed with at least 5 territories recorded), common gull (3 pairs) and meadow pipit (*Anthus pratensis*) were confirmed breeding (Copland *et al.*, 2011).

A review of records from other wind farms in the wider area, together with local bird knowledge, ascertained that one pair of breeding golden plover are known from O’Boyle’s Bog, located in excess of 10 km south-west of the proposed wind farm site. This pair was recorded during surveys for Oweninny Wind Farm (ABP Ref No. PL16.PA0029) between 2010 and 2012 and have occurred at this location annually since at least that period.

Surveys for Oweninny Wind Farm (2010 and 2013) recorded similar species as those recorded during the 2009 Oweninny cutover bog surveys (Copland *et al.*, 2011). A breeding attempt by greenshank (*Tringa nebularia*) was also recorded. During the Oweninny Wind Farm (2010 – 2013) surveys, low numbers of whooper swan were occasionally recorded. Greenland white-fronted geese were recorded on one occasion. Red grouse were found to be widely distributed across the Oweninny site in areas of suitable habitat.

The revised EIAR for the proposed amendments to the previously permitted Sheskin Wind Farm (ABO Wind Energy Ltd.) (ABP Ref No. PL16.311157; Planning Ref No. 20834) was reviewed as part of the review of existing available bird records for wind farms in the wider area.

Surveys undertaken for the original permitted Sheskin Wind Farm development in 2014 and 2015 recorded several species of note, including golden plover, curlew, merlin, peregrine, kestrel, sparrowhawk, red grouse, snipe, teal, woodcock and lesser black-backed gull. During the breeding season, golden plover were observed on Slieve Fyagh, in excess of 10 km south-west of the proposed wind farm development, with a possible breeding pair recorded in April 2015. This may have been the pair previously recorded on Boyle’s Bog. At least one pair of kestrel are thought to have bred in the vicinity of the Sheskin Wind Farm site. There were two observations of merlin; however, no evidence of breeding was recorded. One merlin territory may have been located approximately 3 km northwest of the Sheskin Wind Farm site boundary (in excess of 5 km from the proposed wind farm site boundary).

An estimated 4-5 red grouse territories were believed to occur on intact lowland blanket bog within the Sheskin Wind Farm bird survey area, to the east and the northwest of the Sheskin Wind Farm site. A minimum of 4 pairs of snipe were recorded breeding approximately 2 km northwest of the Sheskin Wind Farm site during surveys in 2015, while one breeding pair was recorded on the lowland blanket bog to the west of the site. During hinterland surveys within 6 km of the Sheskin Wind Farm site between April and July 2015, golden plover, red grouse, peregrine and merlin were recorded. During the winter months, hinterland surveys recorded whooper swan at Carrowmore Lake (in excess of 15 km west of the proposed wind farm site).

Please refer to **Section 3.2.1** above and Figure 14-16 in Chapter 14 of the EIAR which outline the locations of existing and proposed wind farm developments in the wider area +in the context of the proposed wind farm development.

3.2.9 NPWS Rare and Protected Species Dataset

An information request was sent by MKO to the NPWS requesting any bird records from the NPWS Rare and Protected Species Database for the hectad encompassing the proposed wind farm site (G03). Data was received on the 31st December 2021. No bird records were included in the dataset received.

3.2.10 National Surveys of Hen Harrier in Ireland

The results of the 2015 National Hen Harrier Survey were consulted by MKO to identify hen harrier breeding sites within the relevant hectad. There were no records of breeding hen harrier in hectad G03 in the 2015 survey. Additionally, there were records of hen harrier wintering in hectad G03, but no records of birds roosting within this hectad. The distribution data is from the 2007-11 Bird Atlas and the roost site locations are sourced from unpublished Irish Winter Hen Harrier Survey data.

3.2.11 Hen Harrier Project

The Hen Harrier Project operates in SPAs designated for hen harrier. The Hen Harrier Project reports were reviewed by MKO for any relevant data on hen harrier within the proposed wind farm site and its hinterland. There are no SPAs designated for hen harrier within or near the proposed wind farm site; therefore, this project was not considered further in the assessment.

3.2.12 Whooper Swan Census - 2020

The results of the 8th International Swan Census were consulted by MKO to identify whooper swan habitat use and distribution within the relevant 10 km hectad (Burke *et al.*, 2021). A total population of 973 birds were recorded in county Mayo. No flocks of international or national importance were identified within the county. Three populations of <50 birds and one population of 50-100 birds were recorded within the Blacksod/Broadhaven Bay SPA (located 14.4 km to the west of the proposed wind farm site).

3.2.13 Greenland White-fronted Goose

The 'Bog of Erris' flock of Greenland white-fronted goose was identified by the NPWS DAU as part of pre-application consultation for the proposed wind farm development. This species is known to occur regularly on Bangor Erris Bog, located approximately 20 km south-west of the proposed wind farm site. This area of lowland blanket bog is encompassed within the Bangor Erris Bog NHA (001473). A review of the most recent Greenland White-fronted Goose Study/NPWS census report available on-line from 2021/22 (GWGS/NPWS, 2021)

determined that a maximum count of 9 birds was recorded for the autumn and spring census for the Bog of Erris during 2021/22 (same maximum count as 2020/21).

In addition to the above, the 2021/22 Census reported counts for Greenland white-fronted geese at the following locations recorded between October 2021 and March 2022: Lough Conn (between 6 and 41 birds recorded), Carrowmore (between 7 and 26 birds recorded), and Owenduff (8 birds recorded) (GWGS/NPWS, 2021).

3.2.14 Identification of Target Species

The following table (Table 21) outlines those species for which past records exist or which have otherwise been identified as part of the desk-top study and which meet one or more of the target species selection criteria as outlined in Section 2.3, above. Wind farm sensitive species meeting the selection criteria that were not identified as having previously occurred within the relevant hectad during the desk-top study but for which potentially suitable habitat occurs, such as peregrine falcon (*Falco peregrinus*), were also included as target species on a precautionary basis. The conservation status/level of protection afforded to each species is also included.

As outlined above and as set out in SNH (2017), target species typically comprise those species which are afforded a higher level of legislative protection and should be restricted to those likely to be affected by wind farms. Only red-listed species likely to be affected by wind farms have been included as target species, unless the species meets one of the other target species selection criteria as outlined above e.g., Annex I.

Table 21. Identification of target species for the proposed wind farm development

Target Species	Conservation Status ¹³	Typical Habitat ¹⁴	Target Species for Site Y/N
Peregrine Falcon (<i>Falco peregrinus</i>)	Annex I EU Birds Directive / BoCCI Green-listed/ Wildlife Acts	Breeding Breeds on coastal and inland cliffs. Most birds on the coast breed on the south, west and north coasts, coastal breeding on the east coast is limited by the availability of suitable nesting cliffs. Most inland birds breed on mountain cliffs but will also breed at lower levels. Wintering Resident in Ireland but shows some movement away from its breeding areas in the winter. Can be found on the coast, especially on estuaries where they hunt water birds. Some birds move into cities. Wintering birds may also comprise individuals which have arrived from Britain or even further afield.	Y
Merlin (<i>Falco columbarius</i>)	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts/ SCI	Breeding A rare breeding bird in Ireland. Nests on the ground on moorland, mountain and blanket bog. Also nests in woodland and has taken to nesting in forestry plantations adjacent to moorland. Wintering Much more widely distributed in the winter, than in the breeding season. Merlin move away from high ground at this time of the year and can often be seen on the coast, where concentrations of other birds are attractive as prey species	Y

¹³ BOCCI 4 (Gilbert, *et al.*, 2021)

¹⁴ birdwatchireland.ie

Target Species	Conservation Status ¹³	Typical Habitat ¹⁴	Target Species for Site Y/N
Hen Harrier (<i>Circus cyaneus</i>)	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts	Breeding Breeding birds are confined largely to heather moorland and young forestry plantations, where they nest on the ground. Wintering Spends winter in more coastal and lowland areas throughout Ireland hence most easily seen on the coast in the winter months.	Y
Kestrel (<i>Falco tinnunculus</i>)	BoCCI Red-listed/Wildlife Acts	Breeding A widespread breeder throughout the country. Nests in trees, buildings or in cracks in cliffs. Will use old crows' nests. Found in wide variety of open habitats including coasts, moor land, farmland, wetlands, roadside verges and town parks. Wintering Largely resident within breeding territory. Some birds move within the country, especially down from the uplands.	Y
Sparrowhawk (<i>Accipiter nisus</i>)	BoCCI Green-listed / Wildlife Acts	Breeding Probably the most common bird of prey in Ireland. Widespread in woodland, farmland with woods, larger parks and gardens. Wintering Resident in Ireland. Can be seen throughout the country.	Y
Buzzard (<i>Buteo buteo</i>)	BoCCI Green-listed/ Wildlife Acts	Breeding Widespread breeding species. Nests in trees and sometimes on cliffs, usually with access to open land including farmland, moorland and wetland. Wintering Largely resident.	Y
Golden Eagle (<i>Aquila chrysaetos</i>)	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts	Breeding Formerly bred in Ireland and recently re-introduced to County Donegal to re-establish an Irish breeding population. Wintering Eagles are generally resident, though young birds may wander during the winter.	Y
Snowy Owl (<i>Bubo scandiaca</i>)	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts	Breeding Does not breed in Ireland. The majority of the European population breeds in Scandinavia and Russia. Wintering Rare winter visitor, mainly to western counties such as Mayo. Most often seen roosting during the day on bogs. Some sightings may possibly relate to escaped cage birds, as this species is common in captivity.	Y
Redshank (<i>Tringa totanus</i>)	BoCCI Red-listed/ Wildlife Acts/SCI	Breeding Nests on the ground in grassy tussocks, in wet, marshy areas and occasionally heather. Breeds	Y

Target Species	Conservation Status ¹³	Typical Habitat ¹⁴	Target Species for Site Y/N
		mainly in midlands (especially Shannon Callows) and northern half of the country. Wintering Winters all around the coasts of Ireland, Britain and many European countries. Favours mudflats, large estuaries and inlets. Smaller numbers at inland lakes and large rivers.	
Golden Plover (<i>Pluvialis apricaria</i>)	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts/SCI	Breeding Breeds in heather moors, blanket bogs and acidic grasslands. Distribution limited to the uplands of northwestern counties in Ireland. Wintering Throughout the winter, are regularly found in large, densely packed flocks, and in a variety of habitats, both coastal and inland. Distribution is widespread in Ireland.	Y
Dunlin (<i>Calidris alpina</i>)	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts/SCI	Breeding Nests on the ground in sparse, low vegetation - in Ireland favours machair habitats. Wintering Common along all coastal areas - especially on tidal mudflats and estuaries. Very few inland.	Y
Ringed Plover (<i>Charadrius hiaticula</i>)	BoCCI Amber-listed/ Wildlife Acts/SCI	Breeding Mostly coastal breeding distribution, preferring to nest on exposed wide sandy or shingle beaches. Some breed inland, particularly in the west, where their preferred nesting habitat is on short-grazed pasture beside rivers and lakes. Wintering Winter around the entire coastline but are quite sparse along the north and southeast coasts. Mostly recorded along sandy stretches or along the upper shores of estuaries and non-estuarine coastline	Y
Snipe (<i>Gallinago gallinago</i>)	BoCCI Red-listed/ Wildlife Acts	Breeding Nests on the ground, usually concealed in a grassy tussock, in or near wet or boggy terrain. Wintering Highly dispersed distribution in winter. They forage across a variety of wetland and damp habitats. Particularly high concentrations are found on the fringes of lowland lakes.	Y
Curlew (<i>Numenius arquata</i>)	BoCCI Red-listed/Wildlife Acts/SCI	Breeding Nests on the ground inland in rough pastures, meadows and heather. Not a common breeder but found in most parts of the country. Wintering Winters in a wide range of wetland habitats (coastal and inland) and other good feeding areas including damp fields.	Y
Corncrake (<i>Crex crex</i>)	Annex I Bird Species/ BoCCI Red-listed/ Wildlife Acts	Breeding	Y

Target Species	Conservation Status ¹³	Typical Habitat ¹⁴	Target Species for Site Y/N
		Summer visitor. Nests on the ground in tall vegetation. Formerly common. Now confined to areas of difficult terrain where farming practices have not intensified, mainly North Donegal and western parts of Mayo and Connaught.	
Red Grouse <i>(Lagopus lagopus hibernicus)</i>	BoCCI Red-listed/ Wildlife Acts	<p>Breeding Nest on the ground. Found on mountains, moorland and lowland blanket bogs and raised bogs, where it is associated with heather, requires it for food, shelter and nesting. As a 'game' species it has benefited from past management of heather moorland.</p> <p>Wintering Resident and sedentary (non-migratory). If snow is on the ground, will move to wind swept ridges and lower ground.</p>	Y
Woodcock <i>(Scolopax rusticola)</i>	BoCCI Red-listed / Wildlife Acts	<p>Breeding Nests on the ground in forests and woodland, usually well camouflaged amongst dead leaves and low vegetation.</p> <p>Wintering Wider distribution in winter, occurring in woodland, also scrub and some open areas (bracken and heather-covered hills).</p>	Y
Greenland White-fronted Goose <i>(Anser albifrons flavirostris)</i>	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts/SCI	<p>Wintering Scarce winter visitor to Ireland. Highly gregarious. Traditionally occurred in peatland areas, though now mostly seen feeding on intensively managed grasslands.</p>	Y

3.3 Field Survey Results

3.3.1 Target Species

The following target species were recorded during ornithological surveys for the proposed wind farm development conducted between April 2019 and March 2023, inclusive. Target species observations are summarised in the following sub-sections. Annex I species are highlighted in bold.

- Merlin
- Hen Harrier
- Kestrel
- Sparrowhawk
- Buzzard
- **Peregrine Falcon**
- Woodcock
- Red Grouse
- **Golden Plover**
- **Whooper Swan**
- **Great Northern Diver**
- Snipe

Tabulated summaries of target species VP survey observations, including flight information, are available in **Appendix 4**. VP flight line and activity area mapping for each target species are available in **Appendix 5**.

3.3.1.1 Merlin

All observations of merlin recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 22** below.

Table 22. Summary of merlin survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2020	1	Adult female observed to the west of VP5 in August.	Refer to Appendix 5
	Winter 2022/23	1	Adult female observed to the north-east of VP4 in March.	

Incidental Observations

Additionally, there was one incidental record of merlin recorded on 19th February 2020 when an adult was observed to the east of VP5 by a surveyor en route to the VP location.

3.3.1.2 Hen Harrier

All observations of hen harrier recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 23** below.

Table 23. Summary of hen harrier survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	1	Adult female observed from VP3 in mid-April.	Refer to Appendix 4 & 5
	Winter 2019/20	3	Bird in first year plumage observed to the northwest of VP1 in mid-October. Male in second year plumage observed from VP5 hunting over bog and forestry in late January. A male, presumed the same bird, was observed from VP4 to the northwest of the VP on the same date.	
	Winter 2020/21	1	Male observed to the northeast of VP4 in mid-December.	
	Winter 2021/22	1	Adult male observed west of VP7 in mid-February.	
	Winter 2022/23	2	Adult female observed south of VP6 in late October. Adult male observed northeast of VP1 in late February.	
Hinterland Survey (5 km radius)	Winter 2021/22	1	Three sightings of an adult male (presumed by surveyor to likely comprise two different individuals).	Refer to Appendix 11

3.3.1.3 Kestrel

All observations of kestrel recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 24** below.

Table 24. Summary of kestrel survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	7	Recorded in April, June, August and September from VP1, VP4, VP5 and VP7.	Refer to Appendix 4 & 5
	Winter 2019/20	6	Recorded in October and November from VP1, VP2, VP4, VP5 and VP7.	
	Summer 2020	4	Recorded in July, August and September from VP2, VP3 and VP7.	
	Winter 2020/21	4	Recorded in November (from VP1, VP2 and VP3) and December (VP2).	
	Summer 2021	5	Recorded in May, August and September from VP4 and VP5.	
	Winter 2021/22	6	Recorded in October and November from VP1, VP4, VP5 and VP7.	
	Summer 2022	14	Recorded from all VPs except VP6. Sightings included observations of two kestrels mobbing each other in early August. A juvenile was recorded in mid-September to the southwest of VP4. A juvenile was recorded at the end of September north of VP3.	
	Winter 2022/23	10	Recorded in October and November from all VP's except VP6. There were two records of juvenile birds, both of which were recorded in early November (from VP2 and VP3).	
Transect/ Point Count Surveys	Winter 2019/20	1	November (two birds recorded on Transect A – T1)	Refer to Appendix 8
	Summer 2020	1	September (one bird recorded on Transect B – PC1)	
	Winter 2020/21	1	October (one bird recorded on Transect A – PC3)	
	Winter 2022/23	1	November (one bird recorded on Transect A – T5)	

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Breeding Season Walkovers	Summer 2022	2	17 th June Walkover A (kestrel hunting) and Walkover B (kestrel hunting).	Refer to Appendix 10
Hinterland Survey (5 km)	Winter 2021/22	1	15 th November (adult male recorded).	Refer to Appendix 11
	Winter 2022/23	1	17 th November (one recorded).	

Incidental Observations

Winter 2019/20 There was one incidental sighting of a kestrel in mid-October, observed from VP1 prior to the survey commencing.

Winter 2020/21 There were two incidental records of kestrel recorded (mid-October and mid-November).

3.3.1.4 Sparrowhawk

All observations of sparrowhawk recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 25** below.

Table 25. Summary of sparrowhawk survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	11	Recorded in April, June, July, August and September, from all VPs except VP7.	Refer to Appendix 4 & 5
	Summer 2020	5	Recorded in August and September from VP3 and VP7.	
	Winter 2020/21	1	Mid-December sighting of a female south of VP3.	
	Summer 2021	2	Recorded in May and July from VP3.	
	Winter 2021/22	3	Recorded in October and March from VP3 and VP5.	
	Summer 2022	4	Recorded in April, August and September from VP2, VP4 and VP7.	
	Winter 2022/23	6	Recorded in November and December from VP1, VP4 and from VP5.	
Transect/ Point Count Surveys	Summer 2019	3	April (presumably same male seen twice during Transect A – T7 & T9), June (male recorded during Transect B – T2), September (two birds recorded during Transect A – PC4).	Refer to Appendix 8
	Winter 2019/20	1	October (one bird recorded during Transect A – T10)	
	Winter 2020/21	1	November (one female recorded during Transect B – T2)	
	Summer 2022	4	July (two individuals recorded in area south of river at PC8, including juvenile heard calling from trees, nest site likely close by), September (one bird recorded during Transect A – PC5; female recorded during Transect B soaring over forestry – T4).	
Winter Walkover Surveys	Winter 2022/23	1	18 th January Route A (large female flushed from forestry).	Refer to Appendix 9
Hinterland Surveys	Winter 2021/22	2	14 th January (one male recorded).	Refer to Appendix 11
	Winter 2022/23		1 st March (female recorded).	

Incidental Observations

Summer 2020 Sighting of a sparrowhawk in mid-May from area of VP2.

3.3.1.5 Buzzard

All observations of buzzard recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 26** below.

Table 26. Summary of buzzard survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	4	Recorded in May and September from VP2, VP4 and VP5.	Refer to Appendix 4 & 5
	Winter 2019/20	1	Recorded in March from VP1.	
	Summer 2021	5	Recorded between May and August, mainly from VP3 and also from VP2.	
	Summer 2022	11	Recorded in April, June, July and August, from all VPs except VP4. These included an observation of a pair hunting and soaring together before dropping into forestry, recorded northeast of VP1 in mid-June. In early August, two buzzards were recorded in-flight together north of VP5.	
Transect/ Point Count Surveys	Summer 2019	1	June (adult recorded during Transect A – T6)	Refer to Appendix 8
	Summer 2020	1	July (one bird recorded during Transect B – T1)	
Hinterland Surveys	Winter 2021/22	1	8 th March (one recorded).	Refer to Appendix 11

Incidental Observations

Summer 2022 Two incidental records of buzzard on the same date in mid-June prior to the commencement of a survey at VP1. Another mid-June incidental record of buzzard prior to the commencement of a survey at VP6.

3.3.1.6 Peregrine

All observations of peregrine recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 27** below.

Table 27. Summary of peregrine survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	1	Recorded in September from VP3.	Refer to Appendix 4 & 5
	Winter 2019/20	2	Recorded in October from VP1 and VP6	
	Winter 2020/21	2	Recorded in December from VP2 and in March from VP2.	
	Summer 2021	1	Recorded in August east of VP5.	
	Winter 2021/22	2	Recorded in October and January, both from VP5. The January record comprised a juvenile observed east of VP5.	
	Winter 2022/23	1	Recorded in October, comprising an individual observed to the south-east of VP3 hunting golden plover.	
Hinterland Surveys (5 km)	Winter 2022/23	1	November (one observed on ground).	Refer to Appendix 11

For non-core survey data relating to peregrine, please see **Appendix 14**.

3.3.1.7 Woodcock

All observations of woodcock recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 28** below. All sightings of woodcock over this period comprised winter season records only.

Table 28. Summary of woodcock survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Winter 2019/20	1	Recorded in January during VP2.	Refer to Appendix 4 & 5
	Winter 2021/22	3	Recorded in mid-December during VP2 and VP3.	
	Winter 2022/23	1	Recorded in mid-February during VP7.	
Transect and Point Count Surveys	Winter 2019/20	6	November (two birds recorded during Transect A – T6 & PC10; two birds recorded during Transect B – T1 & PC5), December (one bird recorded during Transect B – T2), January (one bird recorded during Transect A – T6)	Refer to Appendix 8
	Winter 2020/21	1	October (one bird recorded during Transect B – T4)	
	Winter 2021/22	4	December (two birds recorded during Transect A – T5 & PC8), January (one bird recorded during Transect A – T1; one bird recorded during Transect B – T5)	
	Winter 2022/23	3	November (two birds recorded during Transect A – T1 & T6), February (one bird recorded during Transect A)	
Hinterland Surveys	Winter 2021/22	1	8 th March (adult flushed on way to Altderg Lough)	Refer to Appendix 11

Incidental Observations

Winter 2019/20 Multiple incidental records of woodcock in mid-November and late March, comprising birds flushed as surveyors traversed the site, including in the vicinity of VP1, VP2 and VP3.

Winter 2021/22 Frequent incidental records of birds being flushed by surveyors, including ten birds flushed on one date in early December in the vicinity of VP1 and VP3 (between access barrier and VP3). Birds also flushed in the vicinity of VP3, VP6 and VP7 on several dates in mid-January and February, including five birds flushed as a surveyor was exiting the site following a VP survey at VP1 in early February.

Multiple birds flushed by surveyors in early to mid-March in the vicinity of VP2, VP3, VP4 and VP6, including four birds flushed from a roadside area adjacent to cattle feeders as the surveyor arrived to site for a survey at VP4, twelve birds flushed as a surveyor travelled to VP2, including seven flushed from the track north-east of the VP, and four birds flushed from the track northeast of VP3.

Winter 2022/23 Multiple incidental sightings of flushed woodcock in October, December and February in the vicinity of VP1, VP2, VP3, VP6 and VP7 as surveyors either entered or left the site, including six records of flushed birds in early December near VP1 and four records of flushed birds in early December near VP3.

3.3.1.8 Red Grouse

All observations of red grouse recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 29** below.

Table 29. Summary of red grouse survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2020	1	Recorded in early May to the north of VP5.	Refer to Appendix 4 & 5
	Summer 2022	1	Recorded in early May to the northeast of VP5.	
	Winter 2022/23	4	Recorded in early October and mid-February during VP5 and VP7.	
Winter Walkover Survey	Winter 2019/20	-	Droppings recorded.	Refer to Appendix 9
	Winter 2020/21	-	14 th & 24 th February (droppings recorded).	
	Winter 2021/22	8	10 th November Route A (fresh droppings recorded at several locations, also a pair flushed southwest of VP6), Route B (pair flushed southeast of VP7, also one record of droppings). 9 th February Route A (male recorded), Route B (one bird observed, and droppings recorded at one location). 14 th March Route B (three pairs, plus one female)	
	Winter 2022/23	1	17 th February Route A (one bird).	
Breeding Walkover Survey	Summer 2021	2	Including one heard calling in July.	Refer to Appendix 10
	Summer 2022	2	17 th June Walkover B (same adult male flushed twice). 24 th August Walkover B (droppings recorded).	

Incidental Observations

Summer 2019 Bird heard calling to the east of VP7 in mid-May, droppings recorded during VP6 and VP7 in late May.

Winter 2019/20 Bird heard calling to the east of VP4 in late November.

Summer 2020 Bird heard calling to south of VP5 in mid-July and to the south-east of VP4 in late August.

Summer 2021 Droppings recorded near VP7. Red grouse heard calling to the south-east of VP4 (late May) and to the east of VP5 (mid-July). Red grouse flushed from a track by surveyor en route to VP4.

Winter 2021/22 Two birds flushed northeast of VP7 in mid-December. Individuals heard calling from south of VP4 and southeast of VP7 (mid-January). Droppings recorded 50 m west of VP7 in mid-January.

Summer 2022 Bird heard calling to the south of VP7 in mid-April. Red grouse heard calling south of VP4.

Winter 2022/23 Several records of birds calling to the east and north of VP7 on one date in early December.

3.3.1.9 Golden Plover

All observations of golden plover recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 30** below.

Table 30. Summary of golden plover survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	2	Group of 45 birds recorded from VP3 in mid-April - flushed by a female hen harrier. In mid-September, another group of approximately 45 birds recorded from VP6.	Refer to Appendix 4 & 5

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
	Winter 2019/20	8	Multiple records of groups, ranging in size from 15 to 80 birds, recorded from VP2, VP4, VP6 and VP7 between mid-October and late March.	
	Summer 2020	1	Group of 40 recorded north of VP6 in late September.	
	Winter 2020/21	9	Two individuals and six records of groups, ranging in size from 13 to 200 birds, recorded from VP1 (200 birds), VP4 (max. 84 birds), VP5, VP6 and VP7, between mid-December and late February.	
	Summer 2021	1	23 birds observed in mid-April to south of VP4.	
	Winter 2021/22	27	Multiple records of groups, ranging in size from 2 to 170 individuals, recorded from all VPs except VP3 between mid-October and late March (groups of in excess of 100 birds recorded from VP4 and VP6).	
	Summer 2022	6	Groups of between 6 and 62 recorded from VP4, VP6 and VP7 between early and mid-April. No further sightings for the remainder of the summer 2022 survey period.	
	Winter 2022/23	10	Multiple records of groups, ranging in size from 12 to 86 birds, recorded from all VPs except VP1 and VP2 (maximum group record of 86 birds during VP6).	
Transect and Point Count Surveys	Winter 2021/22	1	January (one bird heard calling during Transect A – PC3)	Refer to Appendix 8
Winter Walkover Survey	Winter 2020/21	27	14 th February (1 birds recorded). 24 th February (26 birds recorded).	Refer to Appendix 9
	Winter 2021/22	5	10 th November Route A (four flushed northwest of VP6, flock of seven circling overhead northwest of VP6, two heard calling north of VP1), Route B (total 40 birds southeast of VP7). 14 th March Route B (11 birds observed).	
	Winter 2022/23	5	17 th February Route A (two birds observed). 24 th March Route A (one adult flushed, also sightings of two individuals alarm-calling on the ground in separate locations, possibly holding territory) and Route B (four adults on the ground by pools).	
Breeding Walkover Survey	Summer 2021	4	15 th July (heard calling and singing to the northwest, at least four birds seen). 28 th July (one individual flew over VP7 area).	Refer to Appendix 10
	Summer 2022	7	17 th June Walkover A (including an adult alarm calling, a breeding pair close to a nest-site, and three non/failed breeders). 24 th August Walkover A (adult flushed from ground).	
Hinterland Surveys	Winter 2021/22	3	14 th January (50 birds recorded) 8 th March (11 circling bog to south of road, plus 14 on ground).	Refer to Appendix 11
	Summer 2022	1	15 th September (1 bird recorded).	
	Winter 2022/23	2	1 st March (flock of 45 and flock of 70 recorded).	

Incidental Observations

Summer 2019 Birds heard calling from northwest of VP6 in late May and mid-June, also to the north of VP6 in late August.

Winter 2019/20 Birds heard calling from southwest of VP4, the hilltop above VP6 and the hilltop to the northwest of VP1 in mid-December. Birds calling to north of VP6 in mid-January and west of VP5 in late March.

- Summer 2021 One bird heard calling over VP5.
- Winter 2021/22 Birds heard calling from VP1, VP4, VP5, VP6
- Summer 2022 One heard calling overhead at VP7.
- Winter 2022/23 Birds heard calling from VP5, VP6 and VP7 between mid-November and mid-February. Flock of 86 birds on the ground as surveyor made their way into VP4 in November 2022).

3.3.1.10 Whooper Swan

All observations of whooper swan recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 31** below.

Table 31. Summary of whooper swan survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Winter 2021/22	3	Flock of eight on migration east of VP7, flock of six northeast of VP7 and a flock of six southeast of VP2 (all observed on one date in mid-October).	Refer to Appendix 4 & 5
	Winter 2022/23	1	Flock of eight observed southwest of VP1 in early December. Travelled east-northeast wards through the south of the site.	

3.3.1.11 Great Northern Diver

All observations of great northern diver recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 32** below.

Table 32. Summary of great northern diver survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Winter 2022/23	1	Two observed flying north-west together during VP5 in early November.	Refer to Appendix 4 & 5
Winter Walkover Surveys	Winter 2021/22	1	10 th November (one flying north of VP3).	Refer to Appendix 9

For non-core survey data relating to great northern diver, please see Appendix 14.

3.3.1.12 Snipe

All observations of snipe recorded during site surveys over the 4-year period April 2019 to March 2023, inclusive, are summarised in **Table 33** below.

Table 33. Summary of snipe survey results

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
Vantage Point Surveys	Summer 2019	6	Recorded from VP4 and VP5 between mid-June and late September, including a male displaying over forestry and clearfell to the northwest of VP4 (18th June).	Refer to Appendix 4 & 5
	Winter 2019/20	6	All recorded from VP1 between mid-January and mid-February.	
	Summer 2020	2	Recorded from VP5 (mid-May) and VP6 (late September).	
	Winter 2020/21	5	Recorded from VP1, VP3 and VP6.	

Survey Type	Survey Period	No. of Sightings	Description	Appendix No.
	Summer 2021	2	Recorded from VP4 (late September) and VP5 (mid-April).	
	Winter 2021/22	12	Recorded from VP4, VP6 and VP7, including individual birds and flocks ranging in size from 15-50 (surveyors noted that early winter group records comprised snipe fresh from migration moving through the site).	
	Summer 2022	4	Recorded from VP4 and VP5, including two adult males observed south of VP5 in early May displaying, drumming and holding territory as they circled over bog, and an adult male chipping to the southwest of VP4 in early July.	
	Winter 2022/23	13	Recorded from VP1, VP2, VP4, VP6 and VP7 between early October (including flock of 32 migrating birds) and mid-January.	
Transect/ Point Count Surveys	Summer 2019	1	April (one bird heard chipping during Transect B – to south of PC4)	Refer to Appendix 8
	Winter 2019/20	2	January (one bird recorded during Transect A – T5), March (one bird recorded during Transect A – T9)	
	Summer 2020	2	May (one bird recorded during Transect B – T5; two birds recorded during Transect A – T6)	
	Winter 2021/22	1	October (one bird recorded during Transect B – T5)	
Breeding Walkover Surveys	Summer 2021	1	28 th July (one flushed).	Refer to Appendix 10
	Summer 2022	2	Adult male displaying south of T3 on Transect B. Adult flushed from the track.	
Winter Walkover Survey	Winter 2019/20	6	21 st February Route A (three birds) and Route B (three birds).	Refer to Appendix 9
	Winter 2020/21	8	Recorded on several occasions.	
	Winter 2021/22	17	10 th Nov Route A (six sightings), Route B (two sightings). 9 th February Route A (four sightings) 14 th March Route A (three sightings), Route B (two sightings)	
	Winter 2022/23	6	18 th January Route A (one bird) and Route B (two birds). 17 th February Route A (two birds) and Route B (one bird)	
Nocturnal Breeding Surveys	Summer 2019	3	20 th June (three snipe heard, including one on Transect A, one on Transect B and one heard drumming at PC4 location on Transect A).	Refer to Appendix 10
	Summer 2022	2	22 nd June (adult male displaying south of T3, another bird flushed).	
Hinterland Surveys	Winter 2021/22	1	8 th March (one flushed from bank of Ballinglen River)	Refer to Appendix 11

Incidental Observations

- Summer 2019 Snipe heard drumming/chipping/calling east and southeast of VP3, south and southeast of VP5, southeast and southwest of VP7 between mid-May and mid-July.
- Winter 2019/20 Snipe flushed by surveyor en route to VP1.
- Summer 2020 One heard calling south-west of VP7 in late July.
- Summer 2021 Heard chipping/calling west and south of VP4 and south of VP3 between late May and late July. In mid-June, one flushed by a surveyor en route to VP4.
- Winter 2021/22 Heard from VP1. Two individuals recorded as surveyor travelled to VP6 in mid-January.

Summer 2022 One heard chipping to the northwest of VP5 at start of June. Also, individuals heard chipping/drumming to the west and north of VP4.

Winter 2022/23 Heard calling on two occasions from VP7.

3.3.2 Secondary Species

The following secondary species were recorded during ornithological surveys conducted in relation to the proposed wind farm development between April 2019 and March 2023, inclusive. Observations of secondary species are summarised as per surveys undertaken in the following sub-sections.

Tabulated summaries of secondary species VP observations, including flight information, are available in **Appendix 4**. VP flight line and activity area maps are available in **Appendix 5**.

3.3.2.1 Grey Heron

Vantage Point Surveys

- Summer 2019, one sighting recorded from VP4 in September.
- Winter 2019/20, one sighting recorded from VP1 in January.
- Summer 2022, total of four sightings, recorded from VP4 and VP5 in May and July.
- Winter 2022/23, one sighting recorded from VP5 in February.

Transect and Point Count Surveys

- Winter 2019/20, one sighting (March)

Hinterland Surveys

- Summer 2019, one bird recorded at Ballycastle Strand in mid-July.

For non-core survey data relating to grey heron, please see **Appendix 14**.

There were no additional observations of grey heron recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.2 Cormorant

Vantage Point Surveys

- Winter 2021/22, one sighting recorded from VP3 in January.
- Summer 2022, one sighting recorded from VP5 in August.

Hinterland Surveys

- Winter 2019/20, one bird recorded in December and two birds recorded in January at Ballycastle Strand

For non-core survey data relating to cormorant, please see **Appendix 14**.

There were no additional observations of cormorant recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.3 Mallard

Vantage Point Surveys

- Summer 2019, two sightings (pairs) recorded from VP5 in April and June.
- Winter 2021/22, one sighting recorded from VP5 in March.
- Winter 2022/23, one sighting recorded from VP1 in March.

Transect and Point Count Surveys

- Summer 2019, one sighting (April)

Hinterland Surveys

Winter 2022/23 November (12 recorded), March (adult male loafing on ponds during survey)

Incidental Observations

Winter 2020/21, one sighting of two individuals recorded from VP4 in February.

Winter 2021/22 Pair flushed out of a quarry by surveyor northeast of VP7.

There were no additional observations of mallard recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.4 Teal

Vantage Point Surveys

- Winter 2022/23, one sighting recorded from VP5 in November.

Hinterland Surveys

Winter 2022/23, November (32 birds recorded), March (adult female loafing on Kileena Lough).

Incidental sightings

Summer 2021, one sighting recorded from north-east of VP3 (pair) in September.

There were no additional observations of teal recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.5 Wigeon

Hinterland Surveys

Winter 2022/23, November (2 birds recorded), March (two adult males loafing on Kileena Lough).

There were no additional observations of wigeon recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.6 Black-headed Gull

Hinterland Surveys

Summer 2021, June (17 birds recorded)

Winter 2021/22, March (one bird recorded).

Winter 2022/23, November (one recorded in field).

For non-core survey data relating to black-headed gull, please see **Appendix 14**.

There were no additional observations of black-headed gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.7 Great Black-backed Gull

Vantage Point Surveys

- Summer 2019, one sighting recorded from VP7 in July.
- Winter 2020/21, one sighting of two birds recorded from VP4 in February.
- Summer 2021, one sighting recorded from VP5 in May.
- Winter 2021/22, one sighting recorded from VP5 in March.
- Summer 2022, two sightings recorded from VP5 and VP6 in April (pair) and July.

Hinterland Surveys

Winter 2021/22, March (pair recorded)

Winter 2022/23, March (one recorded)

For non-core survey data relating to great black-backed gull, please see **Appendix 14**.

There were no additional observations of great black-backed gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.8 Lesser Black-backed Gull

Vantage Point Surveys

- Summer 2019, total of three sightings recorded from VP4 and VP7 in June.

Hinterland Surveys

Summer 2021, June (six birds recorded)

For non-core survey data relating to lesser black-backed gull, please see **Appendix 14**.

There were no additional observations of lesser black-backed gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.9 Herring Gull

Hinterland Surveys

Summer 2021, June (14 birds recorded)

Winter 2021/22, January (34 birds recorded feeding in fields), March (16 birds recorded)

Summer 2022, September (1 bird recorded)

Winter 2022/23, November (1 bird recorded), March (5 birds recorded).

For non-core survey data relating to herring gull, please see **Appendix 14**.

There were no additional observations of herring gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.10 Common Gull

Hinterland Surveys

Winter 2021/22, January (30 birds feeding in fields with herring gulls), March (one recorded).

Winter 2022/23, November (10 birds feeding in fields).

For non-core survey data relating to common gull, please see **Appendix 14**.

There were no additional observations of common gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.11 Iceland Gull

Vantage Point Surveys

- Winter 2020/21, one sighting recorded from VP6 in March.

For non-core survey data relating to Iceland gull, please see **Appendix 14**.

There were no additional observations of Iceland gull recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.12 Gannet

Hinterland Surveys

Summer 2022, September (3 birds recorded).

There were no additional observations of gannet recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.3.2.13 Jack Snipe

Winter Walkover Surveys

Winter 2022/23, March (one bird flushed from Route B).

Hinterland Surveys

Winter 2022/23, March (one bird flushed).

Incidental sightings

Winter 2021/22, two sightings (likely same bird flushed twice) recorded while surveyor was leaving VP4 in January.

Winter 2022/23, one sighting recorded from VP3 in November flushed while surveyor en route to VP location.

There were no additional observations of jack snipe recorded during any of the other surveys carried out during the 4-year survey period from April 2019 to March 2023, inclusive.

3.4 Evaluation of Conservation Importance of Populations of Key Species

The conservation importance of the populations of key species which have been identified within the ZOI is evaluated with regard to national species population estimates and mean county population data, where available for certain species.

3.4.1 Merlin

Merlin is listed under Annex I of the EU Birds Directive and is amber listed in Ireland (Gilbert *et al.*, 2021). To date there has been no systematic national survey undertaken for merlin. As per the latest NPWS Article 12 reporting, the national breeding population of merlin is estimated to be between 200 and 400 pairs. This NPWS Article 12 breeding population estimate is based largely on expert opinion (Hardy *et al.*, 2009).

Merlin was recorded on three occasions over the course of the 4-year survey period. These records included two sightings of merlin during VP surveys (comprising one breeding season and one winter season record, both of which occurred in/within a 500 m radius of the proposed wind farm site. There was also one incidental record of an adult bird (recorded February 2020).

No merlin breeding activity was recorded during any of the surveys undertaken within the study area over the 4-year survey period; however, it is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results.

On this basis, the merlin population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.2 Hen Harrier

Hen harrier is listed under Annex I of the EU Birds Directive and is amber listed in Ireland (Gilbert *et al.*, 2021).

There was a total of eight sightings of hen harrier during VP surveys over the course of the 4-year survey period, comprising one breeding season and seven winter season records. There were also two sightings of males on one date during a winter hinterland survey.

Wintering

Of the seven winter season records, all observations occurred in/within a 500 m radius of the proposed wind farm site during the survey period. Both male and female birds were recorded, including adults and birds in both first- and second-year plumage. No hen harrier winter roosts were identified within a 2 km radius of the proposed wind farm site.

As per the latest NPWS Article 12 reporting, the estimated national wintering population of hen harrier in Ireland is 269-349 individuals (1% of this population equates to 2-3 birds). On a precautionary basis, therefore, the individuals recorded during the winter season surveys at the proposed wind farm site are taken to form part of a wintering population of **National/International importance**, as per NRA (2009).

Breeding

A review of the most recent national survey of breeding hen harrier in Ireland (Ruddock *et al.*, 2016) determined that the national breeding population is estimated to comprise between 108-157 pairs. Therefore, the presence of one breeding pair would be taken to comprise a population of National/International importance.

There was one summer season record of hen harrier, comprising a female recorded in mid-April 2019 (occurred within the east of the site). This comprises the only summer season observation of hen harrier recorded over the course of the 4-year bird survey period.

On the basis of the surveys undertaken within the study area over the 4-year survey period; it is considered that the proposed wind farm site and the surrounding area does not support breeding hen harrier; however, it is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results.

On this basis, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.3 Kestrel

Kestrel is not listed on Annex I of the EU Birds Directive. However, kestrel is red listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). As per the latest NPWS Article 12 reporting, the national breeding population of kestrel is estimated to be between 12,100 and 21,200 individuals.

There was a total of 56 sightings of kestrel during VP surveys over the course of the 4-year survey period, comprising 30 breeding season and 26 winter season records. Of these, 45 flight paths were recorded in/within a 500 m radius of the proposed wind farm site. There were an additional eight records of kestrel during distribution and abundance surveys and three incidental records.

Juvenile birds were recorded during VP surveys in September 2022 indicating that at least one pair of kestrels may have bred in the area; however, it is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results.

On this basis, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.4 Sparrowhawk

Sparrowhawk is not listed on Annex I of the EU Birds Directive and is green listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). As per the latest NPWS Article 12 reporting, the national breeding population of sparrowhawk is estimated to be between 9,100 and 14,830 individuals.

There was a total of 32 sightings of sparrowhawk during VP surveys over the course of the 4-year survey period, comprising 22 breeding season and ten winter season records. Of these, all but one flight path occurred in/within a 500 m radius of the proposed wind farm site. There were an additional 12 records of sparrowhawk during distribution and abundance surveys and one incidental record.

In July 2022, a juvenile(s) was heard calling from trees during a transect with the nest site considered by the surveyor to be located close by. This indicates that at least one pair of sparrowhawk bred in the area; however, it is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results.

On this basis, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.5 Buzzard

Buzzard is not listed on Annex I of the EU Birds Directive and is green listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). As per the latest NPWS Article 12 reporting, the national breeding population of buzzard is estimated to be 1,500 pairs.

There was a total of 21 sightings of buzzard during VP surveys over the course of the 4-year survey period, comprising 20 breeding season and one winter season record. Of these, 17 flights occurred in/within a 500 m radius of the proposed wind farm site. There were an additional three records of buzzard during distribution and abundance surveys (transects and a hinterland survey) and three incidental records.

In mid-June 2022, a pair was observed in-flight together before dropping into forestry northeast of VP1 indicating that a pair may have possibly bred within the site; however, it is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results.

On this basis, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.6 Peregrine

Peregrine is listed on Annex I of the EU Birds Directive and is green listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). As per the latest NPWS Article 12 reporting, the national breeding population of peregrine is estimated to be 515 pairs.

There was a total of nine sightings of peregrine during VP surveys over the course of the 4-year survey period, comprising two breeding season and seven winter season records. Of these, all but one flight path occurred in/within a 500 m radius of the proposed wind farm site. There was one additional record of peregrine recorded during a winter hinterland survey.

It is acknowledged that targeted breeding raptor surveys in-line with best practice guidance were not completed (see **Section 2.9.4.2**) and therefore a precautionary approach is taken with regard to results. On this basis, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.7 Woodcock

Woodcock is not listed on Annex I of the EU Birds Directive but is red listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). A review of the latest NPWS Article 12 reporting determined that due to the uncertainty that exists between the ratio of calling males (recommended reporting unit) to breeding pairs, no reliable population estimate for breeding woodcock is available. However, a population estimate of 2,500 – 9,999 pairs may still be relevant.

There was a total of five sightings of woodcock during VP surveys over the course of the 4-year survey period, all of which comprised winter season records and occurred in/within a 500 m radius of the proposed wind farm site. There were twelve additional records of woodcock recorded during distribution and abundance surveys (winter transects and winter hinterland surveys) and 27 incidental records.

All sightings were made during the winter survey periods. Woodcock was not observed during any of the breeding season woodcock surveys or other breeding season surveys undertaken during the 2019, 2020, 2021 or 2022 breeding seasons.

However, it is acknowledged in **Section 2.9.4.3** above that there were survey limitations with regard to breeding woodcock. Taking a precautionary approach, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.8 Red Grouse

Red grouse is not listed on Annex I of the EU Birds Directive but is red listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). As per the latest NPWS Article 12 reporting, the national breeding population of red grouse is estimated to be between 1,708 and 2,116 pairs.

There was a total of seven sightings of red grouse during VP surveys over the course of the 4-year survey period, comprising two breeding season and five winter season records, all of which occurred in/within a 500 m radius of the proposed wind farm site. There were 13 additional records of red grouse recorded during the winter and breeding walkover surveys undertaken, and 15 incidental records, including birds heard calling on multiple occasions, as well as records of red grouse droppings.

Taking a precautionary approach, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.9 Golden Plover

Golden plover is listed on Annex I of the EU Birds Directive and is red listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021).

Wintering

A review of '*Estimates of waterbird numbers wintering in Ireland, 2011/12 – 2015/16*' (Burke *et al.*, 2018) determined that the national wintering population of golden plover is estimated at 80,707 birds (ROI). As per NRA (2009), a regularly occurring population of 807 golden plover would be required for classification as National/International importance. Based on the size of the largest flock of golden plover recorded during the winter periods, this wintering population does not meet the criteria for a population of either National/International importance.

In order to estimate the county population of golden plover, a review of I-WeBS site data for the county was undertaken in January 2023. It is acknowledged that I-WeBS counts underestimate the numbers of certain species (e.g., golden plover) as these species regularly forage away from wetland sites (Burke *et al.*, 2018). The following mean counts have been recorded for golden plover at I-WeBS sites within the county over the most recent 5-year count period (2016/17 to 2020/21):

- Balla Wetlands: 41
- Ballybackagh: 150
- Ballyglass Wetlands: 6
- Ballyhaunis Lakes: 59
- Blacksod & Tullaghan Bays: 506
- Clew Bay: 139
- Killala Bay: 186

- Lough Cullin: 117
- Lough Mask: 19
- Mullet West: 7
- South Mayo Coast: 187
- Termoncarragh & Annagh Marsh: 302

Based on the above count data for the period 2016/17 to 2020/21, the estimated total mean wintering population for the county is 1,719 individuals. Therefore, a regularly occurring population of 17 individuals (1% of the county population) would be considered to be of County importance.

There was a total of 54 VP survey records for golden plover over the course of the winter survey periods. A total of 36 flight paths were recorded in/within a 500 m radius of the proposed wind farm site. The largest flock recorded over each winter season comprised the following:

- Winter 2019/20: 80 birds observed from VP6 in January and 80 birds recorded from VP4 in late March 2020.
- Winter 2020/21: 200 birds observed from VP1 in February 2021
- Winter 2021/22: 170 birds observed from VP6 in December 2021
- Winter 2022/23: 86 birds observed from VP6 in October

These flocks are considered to be of **County importance** given the numbers that were recorded. Three of these flocks occurred in/within a 500 m radius of the proposed wind farm site.

There were 43 additional records of golden plover recorded during transects, winter walkover surveys and hinterland surveys and 18 incidental winter records.

Breeding

As per the latest NPWS Article 12 reporting, the national breeding population of golden plover is estimated to be between 134 and 156 pairs. Therefore, a regularly occurring population of 1 pair (1% of the national population) would be considered to be of National/International importance.

There were 10 sightings of golden plover during VPs over the course of the summer survey periods. Of these, nine flight paths were recorded in/within a 500 m radius of the proposed wind farm site. All VP records occurred at either the start or the end of the summer survey seasons (mid-April or late September records).

There were 12 additional records of golden plover recorded during transects and breeding walkover surveys and two incidental breeding season records. During breeding walkover surveys, golden plover were heard calling outside and to the north-west of the proposed wind farm site boundary (July 2021), while in June 2022 an adult alarm calling, and a breeding pair considered close to a nest-site, were also recorded. It is acknowledged in **Section 2.9.4.1** above that there were survey limitations with regard to breeding waders, including golden plover.

The individuals recorded during the breeding walkover surveys are taken to form part of a breeding population of **National/International importance**, as per NRA (2009).

3.4.10 Whooper Swan

Whooper swan is listed on Annex I of the EU Birds Directive and is amber listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). Whooper swan is a winter visitor to Ireland occurring from October to April.

There was a total of four sightings of whooper swan during VP surveys over the course of the 4-year survey period, all of which comprised winter season records. All records were of birds believed to be on migration/commuting. Three of the flight paths recorded occurred in/within a 500 m radius of the proposed wind farm site.

There were no other sightings of whooper swan in the vicinity of the proposed wind farm site over the course of the bird survey period. Results indicate that the site does not support a wintering population of whooper swan.

The population recorded has been assigned a conservation importance rating of **Local Importance (Lower Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.11 Great Northern Diver

Great northern diver is listed on Annex I of the EU Birds Directive and is amber listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021). Great northern diver is not a breeding species in Ireland. The closest breeding population is located in Iceland. This species occurs along the Irish coastline between September and April.

There was one sighting of great northern diver during VP surveys over the course of the 4-year survey period, comprising a winter season record. This flight path was recorded in/within a 500 m radius of the proposed wind farm site. There was one additional record of great northern diver recorded during winter walkover surveys (individual travelling west through the northern part of the proposed wind farm site, recorded in November 2021).

A total of two flights by great Northern diver were recorded. These individuals are considered to have been birds commuting towards the coastline. There were no other sightings of this species in the vicinity of the proposed wind farm site over the course of the bird survey period and the site does not encompass suitable habitat for wintering great northern diver. The proposed wind farm site is not considered to be of ecological importance for this species.

The population recorded has been assigned a conservation importance rating of **Local Importance (Lower Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.4.12 Snipe

Snipe is not listed on Annex I of the EU Birds Directive but is red listed as per the most recent assessment of species conservation status in Ireland (Gilbert *et al.*, 2021).

Wintering

A review of the latest NPWS Article 12 reporting and Burke *et al.*, (2018) determined that a national wintering population estimate is not available for snipe. Burke *et al.*, (2018) references the elusive nature of snipe and certain other species as the reasoning for exclusion from the waterbird population analysis carried out.

In order to estimate the county population of snipe, a review of I-WeBS site data for the county was undertaken in January 2023. The following mean counts have been recorded for snipe over the most recent five-year count period available (2016/17 to 2020/21):

- Ballybackagh: 1
- Ballyhaunis Lakes: 4
- Blacksod & Tullaghan Bays: 11
- Castlebar Lakes/Islandeady Chain: 1
- Clew Bay: 4

- Killala Bay: 1
- Lough Mask: 17
- South Mayo Coast: 2
- Termoncarragh & Annagh Marsh: 65
- Wetland near Drumcarrabaun (Belcarra/Ballyglass Road): 1

Based on the above count data for the period 2016/17 to 2020/21, the estimated total mean wintering population for the county is 107 individuals. As per Burke *et al.*, (2018), the county population estimate of wintering snipe, as per I-WeBS data available, likely comprises a considerable under-estimate. However, on the basis of available I-WeBS data, a regularly occurring population of one individual (1% of the county population) would be considered to be of County importance.

There were 34 VP observations of snipe over the course of the winter survey periods, all of which occurred in/within a 500 m radius of the proposed wind farm site. There were an additional 40 observations of snipe recorded during transects and winter walkover surveys and eight incidental records.

Taking a precautionary approach, the winter population recorded has been assigned a conservation importance rating of **County Importance** on the basis of a resident/regularly occurring population assessed to be important at the county level.

Breeding

As per the latest NPWS Article 12 reporting, the national breeding population of snipe is estimated at 4,275 pairs. Therefore, a regularly occurring population of 42 pairs (1% of the national population) would be considered to be of national importance.

There were 14 observations of snipe during the breeding season VP surveys, including 11 flight paths recorded in/within a 500 m radius of the proposed wind farm site. Snipe were also heard calling/drumming/chipping on occasion during VP surveys. There were an additional 11 observations of snipe recorded during transects, breeding walkover surveys and nocturnal breeding surveys and seven incidental breeding season records. It is acknowledged in **Section 2.9.4.1** above that there were survey limitations with regard to breeding waders, including snipe.

Taking a precautionary approach, the population recorded has been assigned a conservation importance rating of **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

3.5 Identification of Important Ecological Features (IEFs)

The following table (Table 34) presents the rationale for either the inclusion or exclusion of target species as IEFs based on criteria set out in Section 2.6. The likely significance of the project on target species that are included as IEFs is considered further in Section 4.

Table 34. Identification of IEFs

Species	Conservation Status ¹⁵	NRA Evaluation (NRA, 2009)	IEF (Yes/No)	Rationale for Inclusion/Exclusion
Merlin	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts/ SCI	Local Importance (Higher Value)	Yes	Merlin was recorded on three occasions during surveys over the course of the overall 4-year survey period. Two flight paths occurred in/within 500 m of the proposed wind farm site. No merlin breeding activity was recorded within the study area over the course of the bird surveys. Further assessment is required in relation to merlin.
Hen Harrier	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts	<u>Wintering</u> National/International importance	Yes	Hen harrier was recorded on ten occasions during surveys over the course of the overall 4-year survey period. One breeding season flight path was recorded in/within 500 m of the proposed wind farm site. No hen harrier breeding activity/breeding population was identified within the vicinity of the proposed wind farm site during the surveys undertaken. Seven winter season flight paths were recorded in/within 500 m of the proposed wind farm. No hen harrier winter roosts were identified within 2 km of the proposed wind farm site. Further assessment is required in relation to hen harrier.
Kestrel	BoCCI Red-listed/ Wildlife Acts	Local Importance (Higher Value)	Yes	Kestrel was recorded on 64 occasions during surveys over the course of the overall 4-year survey period. Of these, 45 flight paths occurred in/within 500 m of the proposed wind farm site. Kestrels were observed in both breeding and non-breeding seasons within the survey period. One pair of kestrels is estimated to have bred in the area over the course of the survey period. Further assessment is required in relation to kestrel.
Sparrowhawk	BoCCI Green-listed / Wildlife Acts	Local Importance (Higher Value)	Yes	Sparrowhawk was recorded on 44 occasions during surveys over the course of the overall 4-year survey period. Of these, 31 flight paths occurred in/within 500 m of the proposed wind farm site. Sparrowhawk was observed in both the breeding and non-breeding seasons. Evidence of sparrowhawk breeding in the area was recorded.

¹⁵ [Wildlife Act, 1976 \(irishstatutebook.ie\)](http://www.irishstatutebook.ie/1976/wildlife-act)

Species	Conservation Status ¹⁵	NRA Evaluation (NRA, 2009)	IEF (Yes/No)	Rationale for Inclusion/Exclusion
				Further assessment is required in relation to sparrowhawk.
Buzzard	BoCCI Green-listed/ Wildlife Acts	Local Importance (Higher Value)	Yes	Buzzard was recorded on 24 occasions during surveys over the course of the overall 4-year survey period. Of these observations, 17 flight paths occurred in/within 500 m of the proposed wind farm site. Buzzard was observed in both the breeding and non-breeding seasons. A pair possibly bred within the proposed wind farm site. Further assessment is required in relation to buzzard.
Peregrine	Annex I EU Birds Directive / BoCCI Green-listed/ Wildlife Acts	Local Importance (Higher Value)	Yes	Peregrine was recorded on 10 occasions during surveys over the course of the overall 4-year survey period. Of these observations, eight flight paths occurred in/within 500 m of the proposed wind farm site. Peregrine was observed in both the breeding and non-breeding seasons. Further assessment is required in relation to peregrine.
Golden Eagle	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts	N/a	No	Golden eagle was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of golden eagle.
Snowy Owl	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts	N/a	No	Snowy owl was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of snowy owl.
Woodcock	BoCCI Red-listed / Wildlife Acts	Local Importance (Higher Value)	Yes	Woodcock was recorded on 17 occasions during surveys over the course of the overall 4-year survey period. Of these observations, five flight paths occurred in/within 500 m of the proposed wind farm site. All sightings were made during the winter seasons. Woodcock was not recorded during any of the breeding season surveys undertaken. Further assessment is required in relation to woodcock.
Red Grouse	BoCCI Red-listed / Wildlife Acts	Local Importance (Higher Value)	Yes	Red grouse was recorded on 20 occasions during surveys over the course of the overall 4-year survey period. Of these observations, seven flight paths occurred in/within 500 m of the proposed wind farm site. Red grouse were recorded in both breeding and non-breeding seasons within the survey period. Red grouse were recorded during breeding walkover surveys, including multiple records of birds heard calling/recording of droppings. Further assessment is required in relation to red grouse.

Species	Conservation Status ¹⁵	NRA Evaluation (NRA, 2009)	IEF (Yes/No)	Rationale for Inclusion/Exclusion
Golden Plover	Annex I EU Birds Directive/ BoCCI Red-listed/ Wildlife Acts/ SCI	<u>Wintering</u> County Importance <u>Breeding</u> National/ International importance	Yes	Golden plover was recorded on 97 occasions during surveys over the course of the overall winter survey period. Of these observations, 36 flight paths occurred in/within 500 m of the proposed wind farm site. Flocks >50 birds were recorded on several occasions (max. 200 birds recorded at one time). These flocks are considered to be of County importance with regard to the wintering population. Golden plover was recorded on 22 occasions during surveys over the course of the overall summer survey period. Of these observations, nine flight paths occurred in/within 500 m of the proposed wind farm site. During breeding walkover surveys golden plover were heard calling (Summer 2021), while in June 2022 an adult alarm calling, and a breeding pair considered close to a nest-site, were recorded. The individuals recorded during the breeding walkover surveys are therefore taken to form part of a breeding population of National/International importance. Further assessment is required in relation to golden plover.
Whooper Swan	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts	Locally important (lower value)	No	There was a total of four sightings of whooper swan during VP surveys over the course of the overall 4-year survey period, all of which comprised winter season records. All records were of birds believed to be on migration/commuting. Results indicate that the proposed wind farm site does not support a wintering population of whooper swan.
Great Northern Diver	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts/ SCI	Locally important (lower value)	No	There was one sighting of great northern diver during VP surveys over the course of the overall 4-year survey period, comprising a winter season record, and one additional record recorded during a winter walkover survey. There were no other sightings of this species in the vicinity of the proposed wind farm site over the course of the bird survey period. The site does not encompass suitable habitat for wintering great northern diver Results indicate that the proposed wind farm site does not support a wintering population of great northern diver.
Snipe	BoCCI Red-listed/ Wildlife Acts	<u>Wintering</u> County importance <u>Breeding</u> Local Importance (Higher Value)	Yes	Snipe was recorded on 74 occasions during surveys over the winter survey period. Of these observations, 34 flight paths were recorded in/within 500 m of the proposed wind farm site. The winter population recorded has been assigned a conservation importance rating of County Importance. Snipe was recorded on 25 occasions during surveys over the summer survey period. Of these observations, 11 flight paths occurred in/within 500 m of the proposed

Species	Conservation Status ¹⁵	NRA Evaluation (NRA, 2009)	IEF (Yes/No)	Rationale for Inclusion/Exclusion
				wind farm site. Snipe were heard calling/drumming/chipping on occasion and were recorded during breeding walkover surveys. Further assessment is required in relation to snipe.
Dunlin	Annex I EU Birds Directive/ BoCCI Red-listed /Wildlife Acts/SCI	N/a	No	Dunlin was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of dunlin.
Ringed plover	BoCCI Amber-listed/ Wildlife Acts/SCI	N/a	No	Ringed plover was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of ringed plover.
Curlew	BoCCI Red-listed/Wildlife Acts/SCI	N/a	No	Curlew was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of curlew.
Redshank	BoCCI Red-listed/ Wildlife Acts/SCI	N/a	No	Redshank was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of redshank.
Corncrake	Annex I Bird Species/ BoCCI Red-listed/ Wildlife Acts	N/a	No	Corncrake was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of corncrake.
Greenland white-fronted goose	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts/SCI	N/a	No	Greenland white-fronted goose was not recorded at any stage over the course of the overall 4-year survey period. Results indicate that the proposed wind farm site does not support a population of Greenland white-fronted goose.

3.5.1 Sensitivity of Bird Species Selected as IEF

The determination of the sensitivity of bird species selected as IEF in the previous section follows the guidance set out in Percival (2003) for assigning sensitivity. The criteria are outlined in **Section 2.6.1** above. Consideration of the information contained in **Table 34** above indicates two 'Very High' sensitivity species have been recorded, one 'High' sensitivity species has been recorded, four 'Medium' sensitivity species have been recorded and three 'Low' sensitivity species have been recorded (see **Table 35** below).

Table 35. Sensitivity of bird species selected as IEFs

	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Species	Merlin (Annex I)	Hen Harrier (Annex I)	Kestrel (red list)	Peregrine (green list)
	Golden Plover (Annex I)		Woodcock (red list)	Buzzard (green list)
			Red Grouse (red list)	Sparrowhawk (green list)
			Snipe (red list)	

4. Likely Significant Effects

4.1 Do-Nothing Effect

Without the Proposed Development proceeding, it is expected that the existing main land-uses on the proposed wind farm site, namely commercial forestry, will continue. Mature stands will be clear-felled in due course and the areas then replanted.

Overall, the diversity of birds within the site would be expected to remain fairly similar as at present. However, for periods the populations of some bird species would be expected to increase when substantial areas are clear-felled and replanted (until closed canopy stage). For the periods when open canopy forest exists, birds of prey such as hen harrier and kestrel could be expected to forage over the young trees.

4.2 Construction Phase Potential Effects

4.2.1 Habitat Loss

The permanent total loss of habitat to facilitate the construction of the Proposed Development is 117.3 Ha, along with an estimated 1.3 km of hedgerow to be removed. This comprises almost entirely conifer plantation (116 Ha), which includes some clear-felled areas.

While some of the bird species which are identified as IEFs can utilise conifer plantation, and especially the open canopy phase (see **Table 36** below), none is dependent on this (non-native) habitat for breeding and/or wintering requirements. Of the species listed in **Table 36** only sparrowhawk, buzzard and kestrel were considered likely to have bred within the conifer plantation in at least one of the survey years. All of the listed raptor species may hunt or forage within or alongside the plantations. The wintering woodcock population in Ireland largely comprises immigrants from Scandinavia and Russia (Crowe, 2005) and birds will readily roost within the margins of conifer plantations, as well as other woodland types and scrub. All of the listed species in **Table 36** below would be expected to continue to utilise the remaining area of plantation (approx. 1,040 Ha) within the proposed wind

farm development site after the wind farm is constructed. Also, it is noted that conifer plantation is a widespread habitat in the local area and throughout north County Mayo and is not a habitat of conservation importance.

Table 36. Bird species listed as Important Ecological Features which may utilise conifer plantation

Species	Use of Conifer Plantation
Merlin	May nest in conifer trees at edge of plantation (adjoining open bog) and hunt over clear-fell & open canopy forest. With two records during vantage point surveys (August 2020 & March 2023) and one incidental record (February 2020), merlin was not considered to breed within proposed wind farm development site.
Hen Harrier	May forage over clear-fell and open canopy forest, and along forest edges. Seven winter records within 500 m of proposed wind farm development site during study, though no evidence of a winter roost within a 2 km distance of proposed wind farm development site. With only one record in the breeding season and taking into account that County Mayo is outside of the known hen harrier breeding range (Ruddock <i>et al.</i> 2016), breeding within at least 500 m of the proposed wind farm development area not considered likely.
Kestrel	May nest in conifer trees and hunt over open canopy forest and clear-fell, as well as along forest edge and tracks. Recorded regularly within the proposed wind farm development area during summer and winter. Juveniles in August & September 2022 indicates breeding took place locally.
Sparrowhawk	Breeds and hunts in woodland, including conifer plantation. Recorded regularly within the proposed wind farm development area during baseline surveys, with breeding confirmed in July 2022.
Buzzard	May nest in mature conifer trees and hunt over open canopy forest and clear-fell, as well as along forest edge and tracks. Recorded regularly within the proposed wind farm development area during summer and winter. Some evidence of breeding occurring within the proposed wind farm development area in 2022.
Woodcock	Often occurs along woodland edges and forest tracks. Recorded within the proposed wind farm development area during winter only.

The proposed wind farm development will also result in the loss of 1.1 Ha of peatland habitat to facilitate two of the required borrow pits (one in south and one in north of site). These are both located on degraded bog and heath, with the southern site partly covered with conifer trees. Other than perhaps meadow pipits, these relatively small areas of peatland habitat would not be expected to support any breeding species of conservation importance. Also, the loss will be off set through the Biodiversity Management and Enhancement Plan (**Appendix 6.4 of the EIAR**), which aims to restore approximately 40 ha of peatland habitat through conifer removal and drain blocking. The BMEP involves the removal of self-seeded conifers from an area of approximately 40 Ha in the northern sector of the site. The area will be located a substantial distance from the turbines (closest distance 650 m to north) and bird species likely to utilise the restored bog, such as kestrel and golden plover, will not be displaced due to the presence of turbines or will not be at an increased risk of collision with turbines.

The Proposed Development requires the removal of approximately 1.3 km of hedgerow along the local road in Ballyglass which forms part of the Turbine Delivery Route and along which the grid connection cable will be laid. This hedging is of low stature and dominated by gorse, willow, hawthorn and brambles (see Section 6.6.1.5 of Chapter 6 of the EIAR). The hedge is limited in its potential for breeding birds, though is likely to support species such as wren, robin, dunnock and blue tit. The hedge would also provide some feeding potential for various passerine species.

It is noted that a hedgerow, using similar species, will be replanted approximately 2 m back from the edge of the existing road when the works are complete.

Notwithstanding the survey limitations relating especially to raptors and waders (including breeding woodcock) (see **Section 2.9** of this report), the following points are noted:

- (i) habitat loss involves mainly commercial conifer plantation (a non-native commercial habitat), along with a small area of degraded bog/heath, and a stretch of 1.3 km of roadside hedgerow (which will be replanted on completion of works),
- (ii) it is expected that all bird species associated with the conifer and bog habitats will still retain a presence on site during and after construction,
- (iii) the loss of degraded bog/heath will be offset by the restoration of up to 40 Ha of peatland habitat through a Biodiversity Management and Enhancement Plan,

On this basis, it is considered that the significance of the effect on birds due to the loss of habitat to facilitate the Proposed Development is an adverse effect of Slight Significance and of long-term duration.

4.2.2 Disturbance to Birds

The construction phase for the proposed wind farm development is anticipated to last between 18 and 24 months. In this period, on-site activities, including tree felling, civil works and turbine erection works, have potential to cause disturbance effects on birds of conservation importance in adjoining and nearby areas.

Scottish Natural Heritage (2016) write “Different bird species have different tolerance levels to disturbance. Even within species, disturbance distance can vary according to time of year or geographical location. Some sensitive species may be disturbed by activity as much as 750 m away.” SNH had published “*A review of disturbance distances in selected bird species*” prepared by Ruddock and Whitfield (2007). This review included 26 ‘priority’ species and was based largely on expert opinion. The 2007 guidance note was replaced in 2022 by “*Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*” (NatureScot Research Report 1283) prepared by Goodship and Furness. The 2022 review included 65 bird species.

Detailed consideration of potential for disturbance is given to the species identified as IEFs at the Proposed Development site (see **Table 34** above).

It is noted that passerine species, including meadow pipit (Red-listed) are not perceived as being prone to disturbance from wind farm construction (SNH 2017) and indeed Pearce Higgins *et al.* (2012) found that densities of skylarks and stonechats increased on wind farms during the construction phase.

Hen Harrier

There was no hen harrier breeding activity recorded within the study area in any of the bird surveys (a female recorded on-site in April 2019 was not showing breeding behaviour). Breeding hen harriers were not recorded in County Mayo in the 2010 or 2015 National Hen Harrier Surveys (Ruddock *et al.* 2016).

Wintering hen harriers were recorded within the study area on seven occasions (including two records of the same bird sighted 6 minutes apart). Birds were observed flying and/or hunting over bog and forestry. However, there was no evidence of winter roosts from the various baseline surveys (though specific survey for winter roosts was not carried out as part of baseline surveys, see **Section 2.4** of this report), or from the literature review, within at least a 2 km radius of the wind farm site.

Hen harrier is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of ‘medium sensitivity’ to disturbance, with a buffer zone of 300-750 m suggested for both breeding birds and non-breeding birds.

While construction works at the site for the proposed wind farm development will take place in an area where hen harriers have been recorded in winter, the potential for disturbance is considered low as the birds were only hunting in the area and not associated with any apparent winter roost. Hunting birds are still likely to pass through areas of the site away from the main construction works area. On the basis that there was no evidence of a winter roost within the proposed wind farm development area, the effect on wintering hen harrier is rated as 'Not Significant'.

Sparrowhawk

The habitat in the study area, i.e., conifer plantation, is suitable for supporting breeding sparrowhawk. The species was recorded in the study area regularly during the various baseline surveys and breeding was considered to have taken place in 2022 (juvenile heard calling).

Sparrowhawk was not considered in the NatureScot (2022) review of disturbance distances in birds or in the review of 'safe working distances' for forestry workers to sensitive bird species by Currie and Elliot (1997). In the absence of such information, a buffer zone of 100-200 m is suggested for breeding birds (as for buzzard, a tree-nesting species, and kestrel, a tree and cliff/crag nesting species, in the NatureScot review).

At the site for the proposed wind farm development, construction works will take place in an area that supported a nesting pair of sparrowhawk at least in the 2022 season. It is considered that the construction of the wind farm would likely have a potential disturbance effect on breeding birds within a distance of up to 200 m from the construction area – this is rated as an 'Adverse Significant Effect' of Short-term duration. Pre-construction surveys will be carried out in suitable breeding habitat within and around the site and, as required, mitigation will be implemented to reduce the significance of this potential effect on breeding sparrowhawks (see **Section 5.5**, below).

It is considered unlikely that construction works would have effects on birds in the proposed wind farm development site outside of the breeding season – significance of potential effect rated as 'Not significant'.

Buzzard

The habitat in the study area, i.e., conifer plantation, is suitable for supporting breeding buzzard. The species was recorded in the study area regularly during the various summer baseline surveys and breeding was considered to have taken place within the site in 2022 (pair dropping into forestry in mid-June). There was only one record in a winter period (27th March 2020), though buzzard would be well into breeding behaviour by then.

Buzzard is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of 'low/medium sensitivity' to disturbance, with a buffer zone of 100-200 m suggested for both breeding and non-breeding birds.

At the site for the proposed wind farm development, construction works will take place in an area that probably supported a nesting pair of buzzard at least in the 2022 season. It is considered that the construction of the wind farm would likely have a potential disturbance effect on breeding birds within a distance of up to 200 m from the construction area – this is rated as an 'Adverse Significant Effect' of Short-term duration. Pre-construction surveys will be carried out in suitable breeding habitat within and around the site and, as required, mitigation will be implemented to reduce the significance of this potential effect on breeding buzzard (see **Section 5.2**, below).

It is considered unlikely that construction works would have effects on birds within the proposed wind farm site outside of the breeding season when the species is scarce – significance of potential effect rated as 'Not significant'.

Peregrine

Peregrine was recorded over the site and the 500 m buffer zone on nine occasions during vantage point watches. All sightings were between August and March and involved birds flying and/or hunting. There are no known breeding territories within at least a 2 km distance of the wind farm site.

Peregrine is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of 'medium sensitivity' to disturbance, with a buffer zone of 500-750 m suggested for breeding birds and 200 m for non-breeding birds.

As peregrine is at most an occasional visitor to the site area and almost entirely outside of the breeding season (one March record), it is considered that construction works are unlikely to deter birds from flying over the area and possibly hunting prey items such as woodpigeon. Typically, peregrine would land on open ground such as bog, rather than within afforested areas to pluck prey items. For peregrine, potential disturbance effect is rated as 'Not Significant'.

Merlin

The habitats in the study area, i.e., bog and conifer plantation, are suitable for supporting breeding merlin. While there was no evidence of merlin breeding in the study area, specific surveys for breeding merlin were not undertaken (see **Section 2.9.4.2**). As there were three records on bog to the south-east of the redline boundary but within the 500 m buffer zone (19th February 2020, 27th August 2020 & 29th March 2023), local breeding is a possibility. It is noted that merlin is a particularly difficult species to census and the traditionally used methods may not provide a true indication of the abundance, densities or distribution of the species (Lusby *et al.* 2011).

Merlin is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of 'medium sensitivity' to disturbance, with a buffer zone of 300 - 500 m suggested for breeding birds. For disturbance by forestry operations, Currie & Elliot (1997) gave a distance range of 200 - 400 m for merlin.

Should merlin breed in future years within or close to the development area for the proposed wind farm, it is considered that the construction of the wind farm would likely have a potential disturbance effect on breeding birds within a distance of possibly up to 500 m from the construction area – this is rated as an 'Adverse Significant Effect' of Short-term duration. Due to the high conservation status of merlin, pre-construction surveys will take place in all suitable breeding habitat which adjoins the site to a distance of at least 500 m and as required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2**, below).

It is considered unlikely that construction works would have effects on birds passing through the site in winter or during migration seasons as in these seasons the birds are highly mobile and tend to have large hunting ranges – significance of potential effect rated as 'Not significant'.

Kestrel

The habitats in the study area, i.e., bog and conifer plantation, are suitable for supporting breeding kestrel. Kestrel was recorded regularly during the surveys, with breeding expected to have occurred within the site at least in the 2022 season. Kestrel was also observed regularly outside of the breeding season.

Kestrel is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of 'low/medium sensitivity' to disturbance, with a buffer zone of 100 - 200 m suggested for breeding birds and 50 m for non-breeding birds.

At the site for the proposed wind farm development, construction works will take place in areas that could support a tree nesting pair of kestrel, as well as within areas suitable for hunting. It is considered that the construction of the wind farm would likely have a potential disturbance effect on breeding birds within a distance of up to 200 m from the construction area – this is rated as an 'Adverse Significant Effect' of Short-term duration. Due to the high

conservation status of kestrel, pre-construction surveys will be carried out in all suitable breeding habitat within the site to a 200 m distance of the construction works area and as required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2**, below).

It is considered unlikely that construction works would have significant effects on birds within the site outside of the breeding season – significance of potential effect rated as ‘Not significant’.

Red grouse

Bog habitat suitable for supporting red grouse occurs to the east, southeast, west and northwest of the site for the wind farm, along with small areas of bog within the redline boundary (in northeast and northwest). The species was recorded on several of the vantage point watches and regularly on the walkover surveys in winter and summer.

Red grouse is not considered in the NatureScot (2022) review of disturbance distances in birds. However, in a review of monitoring data from wind farms located on enclosed upland habitats in the UK, Pearce-Higgins *et al.* (2012) reported that densities of red grouse were significantly reduced at wind farms during construction but that the densities had recovered by the first-year post-construction. Owing to the high conservation status of red grouse and their sensitivity to disturbance, a precautionary buffer zone of 500 m is suggested.

At the site for the proposed wind farm development, construction works will take place within a distance of up to 500 m from open bog suitable for red grouse for the following turbines: T02, T03, T04, T014, T017, T018, T019, T020, T021 & T022.

From the above analysis, it is considered that the construction of the wind farm would likely have a potential disturbance effect on breeding red grouse within a distance of up to 500 m from where works will take place – this is rated as an ‘Adverse Significant Effect’ of Short-term duration. Due to the high conservation status of red grouse, pre-construction surveys will be carried out in all suitable breeding habitat which adjoins the site to a distance of at least 500 m from where works will take place and as required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2**).

Golden plover

Bog habitat suitable for supporting breeding golden plover occurs to the northwest and southeast of the redline boundary, with birds showing breeding behaviour recorded during both vantage point and walkover surveys. Further bog habitat to the east has potential to support breeding, though there was no evidence of birds present during the surveys.

Golden plover was also recorded associating with the bogs during the migration and winter periods, with flocks flying over the site and adjoining open bogs. Flock size varied from small numbers (<10) to up to 200 birds.

Golden plover is considered in the NatureScot (2022) review of disturbance distances in birds. The species is rated as of ‘medium sensitivity’ to disturbance, with a buffer zone of 200-500 m suggested for both breeding and non-breeding birds.

At the site for the proposed wind farm development, construction works will take place within a distance of up to 500 m from open bog suitable for breeding golden plover for the following turbines; T02, T03, T04, T014, T017, T018, T019, T020, T021 & T022.

From the above analysis, it is considered that the construction of the wind farm is likely to have a potential disturbance effect on breeding golden plover within a distance of up to 500 m from the construction area – this is rated as an ‘Adverse Significant Effect’ of Short-term duration. Due to the high conservation status of golden plover, pre-construction surveys will be carried out in all suitable breeding habitat within a distance of 500 m from

where works will take place and as required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2**, below).

It is considered unlikely that construction works would have significant effects on birds landing on the bog in winter or during migration seasons as in these seasons the birds are highly mobile and tend to settle only for short periods in any one particular area of habitat – significance of potential effect rated as ‘Not significant’.

Snipe

Bog habitat suitable for supporting breeding snipe occurs within the site (displaying bird over clearfell in eastern sector in June 2019) and on the bog which adjoins the site to the southeast (breeding behaviour recorded each summer season). While there is extensive bog to the northwest of the site, there was no evidence of breeding snipe here during any of the baseline surveys.

Snipe was also recorded regularly associating with the bogs during the migration and winter periods, with most records from the bog areas adjoining the redline boundary. Numbers in winter were typically single birds but numbers of up to 50 birds in October (mostly from bog in northern sector of study area) indicated local migration.

Snipe was not considered in the NatureScot (2022) review of disturbance distances in birds. However, Pearce-Higgins *et al.* (2012) identified snipe as one of the species showing a reduction (53%) in densities on wind farms during construction. Critically, the authors also found that snipe population densities did not recover after the construction period, with habitat within 400 m of turbines being used less than expected.

At the site for the proposed wind farm development, construction works will take place within a distance of up to 400 m from open bog which provides habitat suitable for snipe, as well as close to clear-fell where a displaying bird was recorded during baseline surveys (though as the replant grows, it will become less suitable as potential nesting habitat).

From the above analysis, it is considered that the construction of the wind farm is likely to have a potential disturbance effect on breeding snipe within a distance of up to 400 m from the works area – this is rated as an ‘Adverse Significant Effect’ of Short-term duration. Due to the high conservation status of snipe, pre-construction surveys will be carried out in all suitable breeding habitat within the proposed wind farm site, as well as suitable habitat which adjoins the site to a distance of up to 400 m from where works will take place. As required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2**, below).

It is considered unlikely that construction works would have effects on snipe outside of the breeding season as wintering birds are more mobile than breeding birds and are active mainly during darkness – significance of potential effect rated as ‘Not significant’.

Woodcock

Woodcock was regularly recorded within the site, and mainly within the northern sector, during the winter periods. Most of the records were incidental, with birds flushed as surveyors traversed the site. Most records were in December, indicating winter influxes. There were no observations of breeding birds on any of the surveys. However, survey limitations were associated with the assessment for breeding woodcock (see **Section 2.9.4.3**) and the assumption is made that breeding within the proposed wind farm site is possible.

During winter, woodcock roost in small area of cover within woodland during the day and fly to (mainly) pasture to feed during darkness. Woodcock is a highly elusive bird and during winter is usually detected only by flushing. At Glenora, the birds from the proposed wind farm development site presumably fly to pasture lands to the east to feed.

Woodcock was not considered in the NatureScot (2022) review of disturbance distances in birds.

It is considered that at the site for the proposed wind farm development, construction works would only disturb birds should the works take place very close to a roosting individual and then the bird would likely fly to another area of woodland away from the works.

It is considered unlikely that construction works would have significant disturbance effects on wintering birds within the proposed wind farm development site – significance of potential effect rated as ‘Not significant’.

Construction works including tree felling have the potential to cause disturbance to breeding birds should they take place close to a breeding territory. A distance of 100-200 m from the work zone is suggested as the disturbance zone – this is rated as an ‘Adverse Significant Effect’ of Short-term duration. Due to the high conservation status of woodcock and the absence of a focused breeding survey (see **Section 2.9**), pre-construction survey will be carried out in all suitable breeding habitat within the proposed wind farm site to a distance of up to 200 m from where works will take place. As required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds (see **Section 5.2** below).

4.2.3 Disturbance/Destruction of Active Nests

Disturbance to, or destruction of, active nests during construction activities could contravene Section 22 of the Wildlife Acts 1976 to 2022 as amended.

Best practice will be followed to minimise disturbance of active nests by the clearing of vegetation from work areas outside of the bird breeding season (March-August inclusive).

However, should ground still need to be cleared during the restricted period, mitigation will be implemented to minimise the significance of the effect on nesting birds (see **Section 5.6**, below).

4.3 Operational Phase

The principal potential impacts on birds by the operation of a wind energy project are:

1. displacement,
2. barrier effects,
3. collision

Disturbance from secondary operations, such as road maintenance, are also considered.

Potential disturbance as a result of the wind farm on birds in hinterland sites is also considered.

4.3.1 Displacement

Displacement of birds from otherwise suitable habitat due to the presence of wind turbines has been reported as a potential impact of wind turbines (Drewitt & Langston 2006, de Lucas *et al.* 2007, Pearce-Higgins *et al.* 2009). The displacement occurs because of behavioural responses that prevent or decrease the use of an area for activities such as nesting or foraging. However, the results of studies on potential displacement have varied widely and in an overall review of the literature Madders & Whitfield (2006) concluded that displacement effects of wind turbines on raptors are negligible for the most part. In a review of potential displacement effects on upland breeding bird densities at twelve wind farm sites in Britain, Pearce-Higgins *et al.* (2009) reported that seven of the twelve species studied exhibited significantly lower frequencies of occurrence close to the turbines.

Detailed consideration of potential for displacement is given for the following species (IEFs) which were recorded within the study area, and which mostly have a high conservation status:

Hen harrier

While there was no evidence of hen harrier breeding in the study area, or indeed anywhere in north County Mayo (Ruddock *et al.* 2016), the species has a presence during winter within the study area (recorded on seven occasions during the four winters), with birds observed flying and/or hunting over bog and forestry. However, there was no evidence of winter roosts from the various baseline surveys (though specific survey for winter roosts was not carried out), or from the literature review, within at least a 2 km radius of the wind farm site. From the baseline survey data, it can be concluded that hen harrier is an occasional winter visitor at the Proposed Development site.

In the review of upland raptors and wind farms, Madders and Whitfield (2006) tentatively rated foraging hen harriers as having a 'low-medium' sensitivity to displacement, though all studies appear to have been in the breeding season. Pearce-Higgins *et al.* (2009) cited a predicted reduction in flight activity of 52.5% within 500 m of the turbine array for breeding birds.

As hen harrier is at most an occasional visitor to the site during winter, it is expected that hunting birds would still pass through the area when the turbines are in operation and that the potential for disturbance is low. Notwithstanding the absence of specific survey for hen harrier within the proposed wind farm development site and the surrounding area (to distance of 2 km), - this effect is rated potentially as an adverse effect of Slight Significance and of long-term duration.

Sparrowhawk

The baseline surveys showed that sparrowhawk is regular at the proposed wind farm site, with breeding considered to have taken place within the site in 2022.

There appears to be no data to show whether sparrowhawk is displaced from an area around turbines, though in the review of upland raptors and wind farms, for sharp-shinned hawk (*Accipiter striatus*) (same genus as sparrowhawk) Madders and Whitfield (2006) tentatively rated this North American hawk as having a 'low' sensitivity to displacement.

As sparrowhawk is a woodland species that nests in woodland and hunts largely at low height along woodland margins and over scrub, it is expected that the species will not be displaced from suitable habitat in the vicinity of turbines at the Proposed Development site - significance of potential effect rated as 'Not significant'.

Buzzard

The baseline surveys showed that buzzard is regular at the proposed wind farm site, with breeding likely to have taken place within the site in 2022.

In the review of upland raptors and wind farms, Madders and Whitfield (2006) tentatively rated foraging buzzards as having a 'low-medium' sensitivity to displacement. Pearce-Higgins *et al.* (2009) cited a predicted reduction in flight activity of 41.4% within 500 m of the turbine array for breeding birds.

As buzzard is a regular species in the area proposed for the wind farm at Glenora, it is expected that the species could show some signs of displacement around the turbines at the Proposed Development site. It is likely that any displacement effect would be highest in the early period of operation, with some degree of habituation occurring over time (Pearce-Higgins *et al.* (2012). Significance of potential effect is rated as 'Slight' and of short to medium-term duration.

Merlin

The habitats in the study area, i.e., bog and conifer plantation, are potentially suitable for supporting breeding merlin. While there was no evidence of merlin breeding in the study area, there were three records on bog to the south-east of the redline boundary but within the 500 m buffer zone (19th February 2020, 27th August 2020 & 29th March 2023), which may indicate local breeding.

There appears to be no data to show whether merlin is displaced from an area around turbines, though in the review of upland raptors and wind farms, for prairie falcon (*Falco mexicanus*) (same genus as merlin) Madders and Whitfield (2006) tentatively rated this North American falcon as having a 'low' sensitivity to displacement.

As merlin is a species that nests in trees or on open bog and hunts close to ground level, it is expected that the species will not be displaced from suitable breeding and/or hunting habitats in the vicinity of turbines at the Proposed Development site - significance of potential effect rated as 'Not significant'.

Kestrel

Kestrel was recorded regularly during the surveys, with breeding possibly occurring within the study area in the 2022 season. Kestrel was also observed regularly outside of the breeding season.

In the review of upland raptors and wind farms, Madders and Whitfield (2006) rated kestrel as having a 'low' sensitivity to displacement. The related American kestrel (*Falco sparverius*) was also given a rating of 'low' sensitivity. Pearce-Higgins *et al.* (2009) found equivocal evidence for weak avoidance of turbines by kestrel.

For kestrel, the potential displacement effect is rated as of Slight Significance and of long-term duration.

Red grouse

Habitat suitable for supporting red grouse occurs to the east, southeast, west and northwest of the site for the wind farm, along with small areas of bog within the redline boundary (in northeast and northwest).

At the site for the proposed wind farm development, some of the turbines will be located 500 m or less from open bog suitable for breeding and/or feeding red grouse, namely T02, T03, T04, T014, T017, T018, T019, T020, T021 & T022.

Pearce-Higgins *et al.* (2009) found no evidence of turbine avoidance by red grouse and, indeed, the occurrence of red grouse was found to be greater close to the tracks within wind farms. Reasons for the association between grouse and wind farm tracks are likely to include (i) supplies of grit on tracks which the birds need to ingest to aid digestion, and (ii) good growth of heather which often may be observed along the drier bog strips alongside the tracks. The present author has also observed grouse dust bathing on dry tracks within the Derrybrien Wind Farm, Co. Galway.

From the available information, it is considered that for red grouse a potential displacement effect is 'Not significant', and the presence of the proposed wind farm development is likely to be a Neutral or even Positive effect of Moderate Significance in the Long-term.

Golden plover

Bog habitat suitable for supporting breeding golden plover occurs to the northwest and southeast of the redline boundary, with birds showing breeding behaviour recorded during both vantage point and walkover surveys. Further bog habitat to the east has potential to support breeding, though there was no evidence of birds present during the surveys.

Golden plover was also recorded associating with the bogs during the migration and winter periods, with flocks flying over the site and adjoining open bogs. Flock size varied from small numbers (<10) to up to 200 birds.

Pearce-Higgins *et al.* (2009) found that golden plover showed significant avoidance of turbines but that the avoidance was largely restricted to a distance of 200 m. However, in further review, Pearce-Higgins *et al.* (2012) found little evidence for consistent population declines in golden plover populations at wind farms sites. They note that populations may become habituated to operational wind farms, which is supported by the lack of decline in golden plover abundance at an upland wind farm over a 3-year period of operation (Douglas *et al.* 2011).

At the site for the proposed wind farm development, several of the turbines (namely T02, T03, T04) will be within a distance of 200 m from open bog suitable for breeding golden plover.

From the above and considering the high conservation status of golden plover, the significance of a potential displacement effect on golden plover during the breeding season is rated as a 'Slight adverse effect'.

It is considered unlikely that the presence of the wind farm would have a significant adverse effect on golden plover landing on the local bogs in winter or during migration seasons as in these seasons the birds are highly mobile and tend to settle only for short periods in any one location – significance of potential effect rated as 'Not significant'.

Snipe

Bog habitat suitable for supporting breeding snipe occurs within the site (displaying bird over clearfell in eastern sector in June 2019) and on the bog which adjoins the site to the southeast (breeding behaviour recorded each summer season). While there is extensive bog to the northwest of the site, there was no evidence of breeding snipe here during any of the baseline surveys.

Snipe was also recorded regularly associating with the bogs during the migration and winter periods, with most records from the bog areas adjoining the redline boundary. Numbers in winter were typically single birds but numbers of up to 50 birds in October (mostly from bog in northern sector of study area) indicated local migration.

Pearce-Higgins *et al.* (2009, 2012) found that avoidance of suitable habitat by breeding snipe extended to 400 m from the turbines and that the predicted reduction in breeding density within 500 m of the turbine array was 47.5%.

At the site for the proposed wind farm development, some of the turbines will be located within a distance of up to 500 m from open bog suitable for breeding and/or feeding snipe (T02, T03, T04, T014, T017, T018, T019, T020, T021, T022).

From the above and considering the high conservation status of snipe, the significance of a potential displacement effect on snipe during the breeding season is rated as a 'Slight' adverse effect.

It is considered unlikely that the presence of the wind farm would have adverse effects on snipe utilising the local bog outside of the breeding season, as snipe is a particularly widespread species during winter and may often occur in active agricultural lands - significance of potential effect rated as 'Not significant'.

4.3.2 Potential Barrier Effect due to Turbines

The potential impact of lines or groups of wind turbines creating a barrier effect to passing birds is mostly relevant to locations where migratory species pass regularly. Rees (2012) cites eight published studies of flight behaviour which reported changes in flightlines for swans or geese initially seen heading towards turbines, at distances ranging from a few hundred metres to 5 km (the larger distances were by birds on migration); 50-100% of individuals/ groups avoided entering the area between turbines, but in some cases the sample sizes were small.

Considering the following:

- The proposed wind farm development site has not been identified as being along a regular migration route for birds, such as wetland species (swans, geese etc.) or birds of prey. While there were four records of whooper swan passing over the study site during the baseline winter surveys, three of these were of small parties (6-8 birds) over the course of approximately one hour on 15th October 2021 and flying south or southwest, which suggests the birds had just arrived in from the sea. The other record was on 6th December 2022 and involved a party of eight birds flying eastwards across the site. There were no records of any geese species passing over the site.
- The proposed wind farm development site has not been identified as being located along a daily or seasonal commuting route between feeding and roost sites used by local birds such as gull species or waterfowl species.
- The proposed wind farm development site is not in proximity to any other operational or permitted wind farm, with the nearest sites located over 5 km to the south-west (see Figure 14-16 in Chapter 14 of the EIAR).

It is considered that the proposed wind farm development would not cause any barrier effects to the movement of bird species either on migration or involved in local movements such as between feeding and roost sites.

4.3.3 Collision

Collision risk posed to bird species is one of the main environmental concerns associated with wind energy developments (Drewitt & Langston 2006, Band *et al.* 2007, Drewitt & Langston 2008, Watson *et al.* 2018, Diffendorfer *et al.* 2021). However, bird species differ widely in their susceptibility to collision mortality. Essentially, birds are at risk of collision only when their flight path overlaps with the rotor blade sweep area of a turbine. It follows that birds whose flight heights coincide with the height of the turbine rotor sweep are most at risk. It is generally considered that passerine species are less susceptible to collision with turbines (SNH 2017).

Collision risk is calculated using a mathematical model to predict the number of birds that may be killed by collision with moving wind turbine rotor blades. The modelling method used in this collision risk calculation is known as the Band Model (Band *et al.* 2007) (see **Appendix 15** for full details). Two stages are involved in the Band Model. First, the number of bird transits through the air space swept by the rotor blades of the wind turbines per year is estimated. Then the collision risk for a bird passing through the rotor blades is calculated using a mathematical formula. The product of these provides a theoretical annual collision mortality rate. Finally, a bird avoidance rate is applied to the collision mortality rate to account for birds attempting to avoid collision. This final collision mortality rate informs the assessment of impacts of the wind farm development on key ornithological receptors (KORs) in the EIAR.

At the proposed wind farm development site, the collision risk assessment is based on Vantage Point surveys undertaken at the site from April 2019 to March 2023 inclusive.

The key ornithological receptors recorded within the potential collision height during surveys were:

- Hen harrier
- Sparrowhawk
- Buzzard
- Merlin
- Kestrel

- Peregrine
- Golden plover
- Snipe

Whooper swan, whilst not identified as a KOR at the proposed wind farm development site due to the scarcity of records, is included as it is a species at high risk of collision.

It is acknowledged that the predicted number of transits, and hence predicted rate of collision, for snipe may be largely underestimated, as flight activity for this species is largely crepuscular in nature (during twilight) while the VP survey sample predominantly consists of hours during daylight period when visibility is not an issue. It is assumed that waterbirds (including snipe) are active for 25% of the night along with daylight hours (as per SNH guidance) and this is accounted for in the model.

For the above species, a summary of the estimated number of collisions over the lifetime (35 years) of the wind farm is given in **Table 37** below (full details are given in **Appendix 15**).

Table 37. Summary of estimated number of collisions for key ornithological receptors.

Species	Estimated Collisions over the Lifetime of Wind Farm	Estimated Collisions per Year	One Bird Collision
Hen harrier	0.45 birds	0.013	78 years
Sparrowhawk	3.36 birds	0.096	10 years
Buzzard	12.26 birds	0.35	3 years
Merlin	0.16 birds	0.005	220 years
Kestrel	77.92 birds	2.226	<1 year
Peregrine	0.89 birds	0.026	39 years
Golden plover	367 birds	10.491	<1 year
Snipe	7.29 birds	0.208	5 years
Whooper swan	1.91 birds	0.054	18 years

For three species, hen harrier, merlin and peregrine (all Annex I listed), the predicted collision risk is less than 1 bird over the 35-year life of the wind farm, an effect which is effectively not measurable ('Not Significant').

For whooper swan (Annex 1), the predicted collision rate over the 35-year life of the wind farm is 1.91 birds, a rate which is considered 'Not Significant' in terms of the national population (19,111 All-Ireland population in 2020, Burke *et al.* 2021).

For sparrowhawk (Green-list), the predicted collision rate over the 35-year life of the wind farm is 3.36 birds, a rate which is considered 'Not Significant' in terms of the estimated national population (between 9,100 and 14,830 individuals – see **Section 3.4.4**, above) and the favourable conservation status of the species.

The remaining four species listed in **Table 37** above have somewhat higher predicted collision risks and are considered further in terms of the conservation status of each.

Snipe

For snipe (Red-list), the predicted collision rate over the 35-year life of the wind farm is 7.29 birds or 1 bird every 5 years (calculated from both winter and summer baseline data). While these rates are negligible in terms of the national breeding population of snipe (estimated at 4,275 pairs – see **Section 3.4.12**), it is noted that vantage point surveys are not an effective method of recording flight activity for this species and hence the collision risk

may be under-estimated. Considering the high conservation status (Red list) of the species due to the severe short-term and long-term declines in the national breeding population (Gilbert *et al.* 2021), the significance of collision risk is rated as a 'Long-term Slight Adverse' effect.

Buzzard

For buzzard (Green-list), the predicted collision rate over the 35-year life of the wind farm is 12.26 birds. The size of the bird and its tendency to fly relatively low and within the potential collision risk zone makes buzzard prone to collision. Watson *et al.* (2018) identify *Buteo* species, including *Buteo buteo*, as showing high risk of collision globally. In Ireland, however, buzzard has a favourable conservation status, which limits the potential for ecologically significant effects to result at the population level. However, on a precautionary basis, the significance of collision risk is rated as a 'Long-term Slight Adverse' effect.

Kestrel

For kestrel (Red-list), the predicted collision rate over the 35-year life of the wind farm is 77.92 birds or 2.22 per year. It is noted that kestrel, as well as lesser kestrel (*Falco naumanni*) and American kestrel (*Falco sparverius*), is a genus that is prone to collision (see for instance Barrios & Redrigues 2004, Diffendorfer *et al.* 2021, Hotker *et al.* 2006, Hotker 2008, Lucas *et al.* 2008, Marques *et al.* 2014, Watson *et al.* 2018). This may be partly due to the hovering behaviour of the species, as while birds are hunting and focusing on ground prey, they may be unaware of the turbine position or may suddenly change their position due to a gust of wind. The hovering height level is often within the rotor sweep of the turbines. Of eight casualties recorded at a wind farm in Cadiz Province, Spain, all were juveniles.

While the predicted collision rate is low in the context of the estimated national population of 13,500 birds (Lewis *et al.* 2019), considering the high conservation status of the species and the known susceptibility of the genus to collision, the significance of collision risk is rated as a 'Long-term Moderate Adverse' effect. Mitigation will be implemented to lessen this risk (see **Section 5.3.1**).

Golden plover

Golden plover (Annex I & Red list) is a winter and passage visitor to the site, with breeding also occurring on the bogs which adjoin the site. All the flightlines, however, considered for collision risk modelling refer to winter and passage birds. The predicted collision rate over the 35-year life of the wind farm is 367 birds or 10.49 birds per year.

Burke *et al.* (2019) gave the All-Ireland wintering population at 92,060 birds for period 2011-12 to 2015/16, which is a 43.6% decline since the 1994/95-1988/99 period.

There appears to be relatively few instances in the literature of golden plover casualties due to collision with turbines. Hotker *et al.* (2006) cited four golden plover casualties (Netherlands, Sweden, Germany) in their review of all bird casualties at wind farms in Europe up to July 2004. In a study of collisions with turbines on the German island of Fehmarn, Grunkorn (2010) recorded 3 golden plover casualties during autumn 2009.

While the predicted collision rates are relatively low in the context of the estimated All-Ireland wintering population (92,060, Burke *et al.* 2019), the significance of the effect of the collision risk is rated as 'Long-term Adverse Effect of Moderate Significance' due to the high conservation importance of the species and the recent significant long-term decline in the wintering population.

4.3.4 Potential Impacts on Birds from Maintenance Activities

On-site activities during the operational phase of the wind farm will include turbine servicing, the maintenance and periodic upgrading of access tracks and drains, and substation inspection and maintenance.

Maintenance works at the turbines and the wind farm substation, which typically involve small crews of 2-3 personnel working within the turbines or substation compound, would not be expected to have any impacts on local bird populations either within the site or in bog areas adjoining the site.

Maintenance of access tracks within the wind farm would be an occasional activity and would be relatively minor in terms of construction. It is considered that track maintenance works would not have any measurable effect on the breeding or foraging behaviour of birds within the site or in adjoining areas.

4.3.5 Potential Impacts on Birds in Hinterland Sites

The hinterland surveys in winter and summer covered a wide area at distances of up to 5 km from the redline boundary of the site. Also included was an area of cutover bog located approximately 1.5 km to the north of the site.

The results of these surveys (as described in **Appendix 11**) recorded a wide range of bird species, including cliff nesting seabirds and waterbird species such as wigeon and teal (at Killeena Lough). Effects as a result of the Proposed Development on any of the species recorded more than 2 km from the site would not be expected, i.e., area outside of zone of influence (NatureScott 2017). The surveys did not record any concentrations of wintering birds of conservation importance, such as swans, geese or other waterbirds, within a 2 km distance of the site. Similarly, no locations for breeding species of conservation importance were recorded close to the site.

Based on the hinterland surveys, it is concluded that the operation of the wind farm project does not have potential to have significant effects on any of bird species associated with the surrounding hinterland area.

4.4 Decommissioning Phase

The wind turbines proposed as part of the proposed wind farm development are expected to have a lifespan of approximately 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Proposed Development will be decommissioned. The onsite substation will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid. A description of the decommissioning process is presented in the Decommissioning Plan included in Appendix 4-7 of the EIAR.

During the decommissioning works there is a risk of disturbance, and possible displacement, to sensitive breeding species within and adjoining the site, including red grouse, kestrel, golden plover and snipe. Such disturbance effects would be potentially of similar significance, but shorter duration, as described in **Section 4.2.2**, above (Disturbance to birds), and would depend on the distribution of species at the time. The same mitigation measures will be implemented as prescribed for during the construction phase (see **Section 5.2**, below) to ensure that disturbance to these species, as well as any other species which may have a high conservation status present at the time of decommissioning, is minimised.

4.5 Designated Sites for Birds

4.5.1 European sites

The desktop study (**Section 3.2** of this report) identified six Special Protection Areas (SPAs) within a 20 km radius of the site for the Proposed Development. These are (and see **Table 16** of this report):

- Killala Bay/Moy Estuary SPA (code 004036)
- Illanmaster SPA (code 004074)
- Owenduff/Nephin Complex SPA (code 004048)
- Blacksod/Broadhaven Bay SPA (code 004037)
- Carrowmore Lake SPA (004052)
- Lough Conn and Lough Cullin SPA (code 004228)

Of these, it can be stated with certainty that the proposed wind farm development site does not have habitats which could support the breeding, feeding and/or roosting requirements of the Special Conservation Interests (see **Table 16**) of Illanmaster SPA, Carrowmore Lake SPA, Blacksod/Broadhaven Bay SPA and Lough Conn and Lough Cullin SPA. Also, the baseline bird surveys did not identify flight paths over the wind farm site by any of the SCIs for these four sites. It is also noted that there is no hydrological connectivity between the proposed wind farm development site and any of these four listed SPA sites.

The Killala Bay/Moy Estuary SPA, located at a distance of 10.2 km from the proposed wind farm development site, has golden plover as a SCI (SPA has habitat for non-breeding birds). Whilst wintering/passage golden plover at times occur in the area of the proposed wind farm development site, due to the distance from the SPA it is highly unlikely that these birds commute between the two locations.

While the proposed development site has hydrological connectivity with the Killala Bay/Moy Estuary SPA, with mitigation in place, it is concluded that there is no risk of adverse effects on water quality of the SPA as a result of any phase (construction, operation, decommissioning) of the project (see the NIS for full details).

The Owenduff/Nephin SPA, which is located approximately 13.4 km from the proposed wind farm development site, has merlin and golden plover as SCIs. As the foraging distances of these species (merlin: within 5 km; golden plover: within core range of 3 km and maximum range of 11 km – SNH 2016) are less than the distance between the two locations, it can be concluded that it is highly unlikely that any records at the proposed wind farm development site of merlin and/or golden plover are connected with the populations within the SPA.

It is concluded that the Proposed Development is not expected to have any significant effects on the SCIs of any Special Protection Area.

In addition to the above listed SPAs, the Glenamoy Bog Complex SAC (code 000500) occurs approximately 150 m north of the proposed wind farm development site. The site synopsis notes the occurrence of breeding populations of merlin and golden plover within the site. While there was no evidence of merlin breeding within the proposed wind farm development site, the three records of merlin from within the 500 m buffer zone could be associated with the population within the SAC. Some of the observations of golden plover during the summer baseline surveys are likely to be associated with the breeding population of the SAC.

However, as the nearest turbines to the SAC are at a distance of over 500 m, it is concluded that the proposed wind farm development does not have potential to have disturbance effects on breeding merlin and golden plover within the SAC during either the construction, operational and/or decommissioning phases.

4.5.2 National sites

Two NHAs adjoin the site, as follows (with listed species of conservation importance from site synopses):

- Inagh Bog NHA (code 002391) – adjoins western boundary of site, with breeding populations of golden plover and red grouse;
- Ummerantarry Bog NHA – adjoins southern boundary of site, with breeding populations of golden plover (with baseline surveys confirming red grouse also present).

The following turbines are within distances of 500 m from Inagh Bog: T02 (125 m), T03 (160 m) & T04 (110 m)

The following turbines are within distances of 500 m from Ummerantarry Bog: T14 (approx. 350 m), T17 (285 m) & T19 (340 m)

Potential for disturbance to golden plover and red grouse at distances of up to 500 m exists from construction work disturbance and to a lesser extent decommissioning disturbance (as discussed in **Section 4.2.2** Disturbance to birds).

Such disturbance is rated as an ‘Adverse Significant Effect’ of Short-term duration. Pre-construction surveys will be carried out in all suitable breeding habitat for these species within a distance of at least 500 m from the works area and as required, mitigation will be implemented during the breeding season (March-August) to reduce the significance of this potential effect on breeding birds.

During the operational phase, it is considered that golden plover could be displaced from suitable breeding habitat within a distance of 200 m from turbines (as discussed in **Section 4.3.1**). Hence, breeding golden plover within the Inagh Bog NHA could be affected – this is rated as a ‘Slight adverse’ effect. With time, some habituation to the presence of turbines is likely (Pearce-Higgins *et al.* 2012).

From the available information, there is no evidence of a displacement effect for red grouse due to the presence of turbines.

4.6 Cumulative Effects

Section 6.8 of the EIAR considers Cumulative Impacts. Under Section 6.8.2 ‘Assessment of Projects’, all wind farms within the same catchment of the Proposed Development were considered (details given in Table 6.20), as follows:

Bellacorick Wind Farm – existing wind farm located approximately 10 km from Proposed Development site

Oweninny Wind Farm – comprising, Phase 1 (in operation located approximately 7 km from Proposed Development, Phase 2 (in operation) comprising 31 turbines located approximately 10 km from Proposed Development, Phase 3 in planning (ABP 316178) comprising 18 turbines located approximately 8 km from Proposed Development,

Sheskin (ABO) Wind Farm – in construction, comprising eight turbines located approximately 7 km from Proposed Development,

Sheskin South Wind Farm – in planning (ABP 315933), comprising 21 no. turbines located approximately 9 km from Proposed Development,

Killala Community Wind Farm – existing wind farm comprising 6 no. turbines located approximately 14 km from Proposed Development site

Kilsallagh Wind Farm – pre-application consultation (ABP 312282), comprising 13 no. turbines located approximately 16 km from Proposed Development,

Tirawley Wind Farm – pre-application consultation (ABP 315864), comprising 31 no. turbines located approximately 8 km from Proposed Development (details not known).

Six of the above projects (Bellacorick, Oweninny (x3), Sheskin (x2)) form a substantial cluster of turbines (if all built) to the southwest of the Proposed Development, varying in distance from approximately 7 km to 13 km from the Proposed Development site. These wind farms are mainly on cutaway bog and conifer plantation, with designated sites comprising blanket bog and other Annex I habitats in the surrounding areas. Between this cluster of wind farms and the Proposed Development site the land use comprises almost entirely peatland habitats (much of which is designated) and commercial forestry.

The Oweninny sites, including the Bellacorick Wind Farm, comprise an area of approximately 5,000 ha and support a range of bird species of conservation importance, including breeding teal, red grouse, golden plover, dunlin, snipe, common sandpiper and common gull. Merlin is occasional on site and may breed. The Phase 3 area supports a winter hen harrier roost, with up to 6 birds recorded at times. However, hen harriers were rarely recorded foraging on site. Whooper swan is occasional during winter. The EIS for the Oweninny project (Phases 1 & 2) recommended mitigation to avoid or minimise disturbance to breeding birds during the Phase 1 and Phase 2 construction periods. With the various mitigation measures, it was considered that the Phase 1 and Phase 2 projects would not have any significant residual effects on breeding birds.

The two Sheskin sites are largely in conifer plantation, though species such as kestrel and sparrowhawk occur within the area.

The Killala Community Wind Farm is close to the town of Killala and is not within an area of importance for birds.

Following analyses of the detailed baseline surveys undertaken for the proposed wind farm development, and the identification of mitigation as required to minimise or avoid potential effects on bird species, it is considered that the risk of collision to wintering and/or migrating golden plover as a result of the proposed development (rated as a long-term adverse effect of moderate significance) may contribute to a cumulative effect when considered with risk to this species associated with other wind farms in the area. While collision risk modelling was not carried out for the Oweninny Phase 1 and Phase 2 Wind Farms, golden plover does occur within the site during winter, albeit in relatively small numbers (source: EIAR 2013) and may be prone to collision with turbines. For the Oweninny Phase 3 project, the estimated figure for collision risk is 5.29 collisions per year (source: EIAR 2023). Golden plovers were not recorded within the risk zone around turbines at the proposed Sheskin South Wind Farm site (source EIAR; 2023).

For all other bird species associated with the proposed wind farm development, it is concluded that, with appropriate mitigation in place, there will be no significant cumulative effect when the proposed wind farm development is considered in combination with other wind energy projects.

The proposed development occurs within a general area where important bird species, such as merlin, red grouse and golden plover, are associated with peatland habitats and especially blanket bog. However, the proposed development is primarily located within forestry habitat, a non-native habitat of relatively low biodiversity value. While further afforestation may result in the loss of (non-designated) peatland habitat, the proposed development will not contribute to a cumulative loss of such habitat and indeed the project will enhance an area of degraded peatland through the Biodiversity Management and Enhancement Plan. The BMEP involves the removal of self-seeded conifers from an area of 40 ha in the northern sector of the site. The area will be located a substantial distance from the turbines (closest distance 650 m) and bird species likely to utilise the restored bog, such as kestrel and golden plover, will not be at an increased risk of collision with turbines.

5. Mitigation and Monitoring

This section describes measures which will be in place to mitigate potential or predicted adverse effects associated with the Proposed Development on avian receptors. Such effects have been addressed in two ways:

- Design of the Proposed Development
- Management of the development phases

5.1 Mitigation by Design

The Proposed Development has been deliberately designed to avoid open bog habitats within the site and specifically areas of unplanted blanket bog in the north-west and north-east sectors of the site.

5.2 Mitigation during Construction

5.2.1 Species Identified as IEFs

The present study has identified potential significant disturbance effects on various breeding species which are listed as Important Ecological Features as a result of the construction works (see **Section 4.2.2**). These species are sparrowhawk, buzzard, merlin, kestrel, red grouse, golden plover, and snipe (woodcock, while not recorded, is included as focused baseline survey was not carried out). Best available evidence has been reviewed (see **Section 4.2.2**) and it is suggested that these species could be disturbed by works, including tree felling, up to and including the at the following distances:

Sparrowhawk	200 m
Buzzard	200 m
Merlin	500 m
Kestrel	200 m
Red Grouse	500 m
Golden Plover	500 m
Snipe	400 m
Woodcock	100 - 200 m

Should any of these species be recorded breeding within the given distances of the works area (as established through confirmatory surveys before and/or during construction – see **Sections 5.6 & 5.7**), a buffer zone (using above distances) will be established around the expected location of the nest (location identified as far as is possible without causing disturbance to the bird) and all works will be restricted within the zone until it can be demonstrated by an ornithologist that the species has completed the breeding cycle in the identified area. Any restricted area that is required to be set up will be marked clearly using hazard tape fencing and all site staff will be alerted through toolbox talks.

The above mitigation, which will apply from March to August (inclusive), will ensure that the works will not have significant adverse effects on the identified IEFs.

5.2.2 Other bird species

A range of passerine bird species breed within the site, including meadow pipit (Red-listed). As noted, (**Section 4.2.3**), disturbance to, or destruction of, active nests during construction activities could contravene Section 22

of the Wildlife Acts 1976 to 2021. Clearance of trees and ground vegetation will take place outside of the bird breeding season (1st March – 31st August) to minimise the possibility of disturbance and destruction to occupied bird nests during the construction phase.

However, it is possible that some ground may still need to be cleared of vegetation during the breeding season or that previously cleared ground will have developed colonising vegetation (such as brambles) which could attract nesting birds such as wren. Such these occurrences arise, the following protocol will be followed:

- The area will be surveyed by a qualified ecologist with ornithological experience up to 10 days before any clearance. Should an active nest be located, the area will be restricted from works by a distance where it is considered that the works would not cause disturbance or abandonment of the nest. Such distances, which will vary according to species and local topography, will be determined by the ornithologist. The restriction will be maintained until it is established that any young birds present have fledged.
- Should an instance arise where the placement of a restriction would have significant implications for the time frame of the project, and where no alternative mitigation is available to prevent disturbance to the nest, the ecologist will evaluate the situation in the context of the conservation status of the species and the stage of breeding, i.e. nest with eggs, nest with young chicks, nest with large young near fledging stage, and will advise on the best approach in the context of the Wildlife Acts. In such cases, the local representative of NPWS will be consulted.

5.3 Mitigation during Operation

5.3.1 Control of vegetation at turbine locations

Areas of forest around turbines which are cleared of trees will be managed to prevent establishment of scrub and rank vegetation which would encourage small mammals and birds and attract species such as kestrel to hunt near the turbines and increase risk of collision. This maintenance will be carried out on an annual basis by mowing or strimming. The managed areas around turbines which will be implemented as mitigation for bats will suffice for birds as well. This approach has proved highly effective at several wind farms in central-eastern Spain where the number of collisions with lesser kestrel decreased by 75% to 100% after the ground was superficially tilled to a distance of 80 m from the turbine base (Pescador *et al.* 2019).

5.4 Mitigation during Decommissioning

As the decommissioning works will involve works similar to those involved at construction stage, these could result in similar effects on birds. Hence, the mitigation that will be undertaken during construction will also be applied during the decommissioning phase (taking into account changes in bird populations and distributions that may have occurred locally during the operational life of the project).

5.5 Pre-construction / Construction Phase Monitoring for Sensitive Species

During the breeding season (March-August) bird monitoring surveys within the proposed wind farm development site will take place to a distance of up to 1 km from the proposed wind farm development site.

The purpose of the surveys is to confirm the locations of breeding territories prior to construction to ensure that mitigation is successfully implemented (see **Section 5.2**) to avoid disturbance effects on breeding activities as a result of the works.

The survey for breeding birds on the adjoining bog to the west and southeast will follow methodology of Brown and Shepherd (1993) and will take place in the April to July period (4 visits) in the season before works, including tree felling, commence. This schedule will provide guidance to the contractor on where restrictive zones are likely to be required.

As noted in **Section 2.9.4** (Breeding Season Distribution and Abundance Surveys), targeted surveys for breeding raptors were not undertaken within the Proposed Development site or within a 2 km radius of the site. Owing to the high conservation status of merlin, and noting the difficulties associated with survey for breeding merlin (as highlighted by Lusby *et al.* 2011), particular focus will be placed on locating possible territories within a distance of at least 1 km of the works area. The survey, which will take place in the period April to July, prior to any works on site commencing including tree felling, will comprise a combination of traditional search methods (after Hardey *et al.* 2009) and vantage point watches focused on suitable habitat within 1 km maximum of the vantage point location (see Lusby *et al.* 2011). The merlin survey will be undertaken by field workers with experience of surveying birds of prey.

Survey limitations were also identified with establishing the status of breeding woodcock on site (see **Section 2.9.4.3**). A full survey for breeding woodcock, following Gilbert *et al.* (1998), will be undertaken in the breeding season prior to any works, including tree felling, commencing on site.

5.6 Construction Phase Monitoring for Breeding Birds On-site

Any ground clearance of habitat during the period March to August that could support breeding birds will be walked to establish the presence of breeding birds (mainly passerines). This will be done by an ornithologist up to 10 days before the clearance works take place. If 10 days elapse without the clearing commencing, a further survey will take place. The focus will be on the area to be cleared but zones up to 100 m (approximately) around the area will also be included. Should a breeding territory be identified, the surveyor will attempt to establish the phase of building, e.g., nest building, incubating, feeding young, and will advise the contractor accordingly on measures to be followed (see **Section 5.2**).

5.7 Post-construction Monitoring for Birds

The objectives of post-construction bird monitoring are:

- To record usage of the site and adjoining areas by birds and their interaction with the operating turbines;
- To monitor short-term and long-term effects on bird populations which had been identified in the baseline surveys as of conservation importance.

The monitoring programme will comprise the following:

5.7.1 Flight activity surveys

Flight activity surveys will be undertaken using the Vantage Point method (Scottish Natural Heritage 2017). The purpose of the surveys is to determine if the presence of the turbines is causing species such as hen harrier, kestrel and buzzard to avoid the site area. This will use the same Vantage Points as used for the baseline EIA surveys so that a valid comparison can be made between the two periods. The surveys will be undertaken monthly

in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the project (in accordance with Scottish Natural Heritage Guidance 2009).

5.7.2 Distribution and abundance surveys within site

Distribution and abundance surveys will be undertaken to monitor short-term and long-term effects on bird populations within the site. Survey methodology will be similar to methods employed for baseline EIAR surveys which will allow a comparison of data to be made for each monitoring year. However, transects may be extended to include sections alongside turbines. Surveys will be undertaken during summer and winter and will be in the same monitoring years as the vantage point surveys.

5.7.3 Distribution and abundance surveys on bog

The baseline walkover survey that was carried out on the bog to west/northwest and northeast of site (for EIAR), and which will be repeated at pre-construction stage, will be repeated again post-construction. This will provide long-term population data for the important breeding species associated with the blanket bog, including golden plover. It is proposed that surveys will be carried out in the same years as the other bird monitoring surveys and will comprise three visits in the period April-July. Method will follow Brown and Shepherd (1993).

5.7.4 Collision searches

The objective of collision monitoring and corpse search is to establish whether bird fatalities are occurring as a result of collision with turbine blades.

Carcass search was traditionally completed by human observers whose efficiency is influenced by several factors including carcass type, environmental conditions and observer competence. Numerous studies have been conducted demonstrating that dogs have a superior ability to detect bird and bat carcasses than humans, particularly with small carcasses or in dense vegetation (see for example Bernardino 2012, Reed 2011, Mathews 2013). A trained dog under the control of a handler will be used

A standard plot size will be selected at each turbine location where search will occur. At the start of each survey, data recorded will include meteorological and ground cover information. The locations of any carcasses found will be recorded by GPS and will be photographed in-situ. The state of each carcass will be recorded on a corpse record card, using the following categories (after Johnson 2003):

- Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger
- Scavenged - an entire carcass which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location such as wings, legs, skeletal remains or pieces of skin
- Feather Spot - ten or more feathers at one location indicating predation or scavenging. If only feathers are found, 10 or more total feathers or two or more primaries must be discovered to consider the observation a casualty.

Searcher efficiency and predation tests will be carried out at the commencement of the programme in order to calibrate the results to account for the search dog's ability to find bird corpses and to also account for scavenging of corpses by animals. These tests would be repeated should there be a need to use different search dogs between years.

The collision searches will be carried out on a monthly basis in Years 1, 2, 3, & 5 of the operational phase of the wind farm.

Should a significant number of casualties be recorded at one or more turbines, the data will be analysed for trends including species, age of birds, season, and weather preceding the finds. Depending on the analysis, a recommendation could be made to the wind farm operator to curtail the operation of a turbine(s) during a likely high-risk period for an identified species. For example, in the case of raptors (birds of prey), a high-risk period would be when recently fledged young are engaged in practice flights and still returning to the nest site.

6. Residual Impacts

With mitigation measures as prescribed in this report implemented in full, and specifically construction phase mitigation to minimise disturbance to breeding bird species of conservation importance, as well as measures to minimise risk of collision to species such as kestrel during the operation phase, it is considered that the significance of the predicted effects on birds as a result of the Proposed Development will range from 'Imperceptible' to 'Moderate' significance.

At this site, the effect on birds from loss of habitat is rated as of Slight Significance. The loss of 1.1 Ha of peatland habitat to facilitate two of the required borrow pits will be off set through the Biodiversity Management and Enhancement Plan, which aims to restore approximately 40 Ha of peatland habitat through conifer removal and drain blocking. The implementation of the BMEP will result in a positive effect for birds.

The construction phase of the project has potential to result in disturbance to breeding birds within a distance of up to 500 m of the works boundary. This could have significant adverse effects (albeit of short-term duration) on species of conservation importance such as red grouse, merlin, golden plover and snipe. With mitigation in place (as recommended following pre-construction survey), comprising the use of work restrictive zones around identified breeding areas, the development is not expected to have any significant residual effects on these species.

During the operational phase of the project, birds may show some avoidance of suitable habitat as a result of the presence of turbines. For breeding buzzard, golden plover and snipe, the effect is rated as a 'Slight adverse' effect. However, it is noted that there is evidence that populations of species such as golden plover may become habituated to operational wind farms (Douglas *et al.* 2011).

During the operational phase of the project, birds will be at some risk of collision with turbines, with snipe, buzzard, kestrel and golden plover (winter/passage populations) identified as the species at most risk. For snipe and buzzard, the significance of the risk is rated as a 'Slight adverse' effect of long-term duration, while for kestrel and golden plover the significance of the risk is rated as a 'Moderate adverse' effect of long-term duration. For kestrel, mitigation will be implemented to discourage birds from hunting close to turbines and the significance of the effect can be reduced to slight.

The baseline surveys did not identify any regular migration routes or local movements of wetland bird species through the site. The proposed development is not expected to have any residual effect on migrating species or bird populations associated with sites in the hinterland.

The Proposed Development is not expected to have any residual effects on the Special Conservation Interests of any Special Protection Area (as detailed in the Natura Impact Statement).

The breeding golden plover population associated with the Inagh Bog NHA could be displaced from suitable breeding habitat within a distance of 200 m from turbines during the operational phase - this is rated as a 'Slight adverse' effect. With time, some habituation to the presence of turbines is likely.

7. Conclusion

The following is concluded with regard to the Proposed Development, noting the survey limitations as described in **Section 2.9**, and taking into account mitigation and monitoring as described in **Section 5**:

- The effect on birds due to habitat loss during the construction phase of the proposed wind farm development is rated as an adverse effect of Slight Significance. The implementation of the BMEP, which will restore an area of degraded bog, is likely to result in a positive effect for birds.
- No significant effects are predicted on birds due to disturbance during the construction or decommissioning phases of the proposed wind farm development.
- A slight adverse effect for breeding buzzard, golden plover and snipe is predicted during the operational phase due to possible displacement or avoidance of suitable habitat as a result of the presence of turbines.
- The Proposed Development is predicted to result in collision casualties for snipe, buzzard and kestrel (rated as 'Slight adverse' effect of long-term duration) and wintering golden plover (rated as a 'Moderate adverse' effect of long-term duration).
- The Proposed Development is not expected to have any adverse effect on migrating species or bird populations associated with sites in the hinterland.
- The Proposed Development is not expected to have any residual effects on the Special Conservation Interests of any Special Protection Area (as detailed in the Natura Impact Statement).
- The breeding golden plover population associated with the Inagh Bog NHA could be displaced from suitable breeding habitat within up to 200 m from turbines during the operational phase - this is rated as a 'Slight adverse' effect.
- The Proposed Development will not result in significant cumulative impacts on birds, in combination with land management, other wind farms or other projects, proposed, existing or permitted in the area.

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Appendix 1

Statement of Personnel Competency and Expertise

Team Role	Name, Role and Qualification(s)
Project Ornithologist	John Murphy (Consultant Senior Ornithologist, Dip.)
Co-ordination of Field Surveyors	John Murphy & Ciara Barry-Hannon (Ecologist, BSc.)
Field Surveyors	Shane Cully (Field Ornithologist, BSc.)
	Paidi Cullinan (Field Ornithologist)
	Austin Cooney (Field Ornithologist)
	John Collins (Ecologist, BSc.)
	Joe Kelly (Field Ornithologist, BSc.)
	Stan Nugent (Field Ornithologist, BSc.)
	Frank Connelly (Field Ornithologist)
	Luíse Ní Dhonnabháin (Zoologist, BSc.)
GIS Mapping & Data	Valerie Heffernan (Environmental Scientist, MSc. BSc.)

[John Murphy](#)

John Murphy is a consultant senior ornithologist formerly working with Malachy Walsh and Partners (MWP). He is very experienced having worked in the field of ornithology and ecology since 1982 and has extensive knowledge of the Irish landscape with regard to bird populations. He collaborates regularly with NPWS on different projects throughout the country. John is one of the country's foremost ornithologists and is a licensed bird ringer. He has always had an interest in wildlife photography and his work has been published in several magazines and books. As a 'Heritage in the Schools Specialist', he has travelled the country lecturing in schools and colleges, and to various clubs and organizations. He was a former Biodiversity Officer with Clare County Council. He worked with MWP on a wide variety of projects nationwide from 2010 until 2021. He spends as much time in the field as possible as a bird observer.

Project Role: Project ornithologist, overall bird survey design, management and co-ordination of field surveyors.

[Ciara Barry-Hannon](#)

Ciara Barry-Hannon is an ecologist who worked with MWP for three years on a part-time and full-time basis. She qualified with an Honours Degree in Wildlife Biology from Munster Technological University (MTU), formerly I.T. Tralee, in 2020. Over the last three years she has contributed to and helped to complete numerous reports for bird survey work and is experienced in data collation and field ecology survey techniques.

Project Role: Management and co-ordination of field surveyors.

[Shane Cully](#)

Shane has an Honours Degree in Wildlife Biology and worked with MWP as a ornithological field surveyor on a full-time basis until early 2023. He has over 6 years general birding experience. He has extensive experience in vantage point surveys, transect surveys, nocturnal bird surveys, raptor surveys, targeted hen harrier surveys and surveys for moorland breeding species. He has previously been involved in the Corncrake Conservation Project with Birdwatch Ireland where he undertook dedicated night-time surveys, on a nightly basis during peak season,

and dealt directly with landowners with regards to participation in the Corncrake Grant scheme. He has also worked with Birdwatch Ireland on the Results Based Agri-Environment Payments Scheme (RBAPS) in the Shannon Callows. This work included surveying of breeding waders, monitoring of whinchat, and signing farmers/landowners up to the scheme.

Project Role: Field surveyor.

[Paidi Cullinan](#)

Paidi worked with MWP as an ornithological field surveyor on a full-time basis until early 2023. He has more than 20 years of bird watching experience in Ireland and abroad and is the Vice Chairperson of the Clare branch of Birdwatch Ireland and the Ebird county recorder for Clare. Paidi has worked on a variety of projects in many locations around Ireland. He is proficient in I-Webs, common bird census, vantage point surveys, transect surveys, targeted hen harrier surveys, raptor surveys, hinterland surveys, and surveys for moorland breeding birds. He is a subscriber to British Birds, Dutch Birding & BirdGuides. He has field experience of bird ringing & bird sound recording.

Project Role: Field surveyor.

[Austin Cooney](#)

Austin has more than 35 years of bird surveying experience both in Ireland and abroad and is an active member of the Clare branch of Birdwatch Ireland. Austin has worked on a variety of projects in many locations around Ireland. He is proficient in vantage point surveys, transect surveys, point count surveys, hinterland surveys, raptor and moorland breeding bird surveys. Austin has over 10 years IWeBS survey experience and is co-author of the book "Shannon Airport Lagoon – A Unique Irish Habitat".

Project Role: Field surveyor.

[John Collins](#)

John has a Degree in Freshwater and Marine Biology in 2018. His final year project was focused on the diet of breeding raven on the Loop Head Peninsula, Co. Clare, from which he gained extensive bird observational experience. In 2018, he carried out ornithological surveys of rice paddies in Spain which contributed to his knowledge of species identification. John has been a volunteer with a local group in West Co. Clare and has been involved in hen harrier winter roost and summer breeding site surveys.

Project Role: Field surveyor.

[Joe Kelly](#)

Joe graduated with a degree in Wildlife Biology in 2012. With over 20 years of ecological and ornithological experience, he has excellent bird identification skills and in-depth knowledge of a wide range of bird survey methodologies including waterfowl surveys, vantage point watches, dedicated raptor watches, and breeding walkover surveys. Joe has previously worked with Coillte collecting hen harrier data, and with the Golden Eagle Trust tracking and monitoring the movement of white-tailed eagles.

Project Role: Field surveyor.

Stan Nugent

Stan Nugent set up his company *Waxwing Wildlife Productions Ltd* in 2006. Through his company he has provided ecological services and natural history photography/videography expertise. He is an active member of Birdwatch Ireland and has contributed to I-WeBS surveys. He is proficient in vantage point surveys, transect and point count surveys, and hinterland surveys. In the summer of 2021, he worked for the NPWS as their Hen Harrier monitor on Scatterry Island. His qualifications include a BSc. in Environmental Studies (Open University) and the BTO Certificate in Bird Surveying.

Project Role: Field surveyor.

Frank Connelly

Frank is knowledgeable on Irish birdlife with a special interest in hen harrier conservation. His lifetime of dedication to Irish raptors began at an early age. Frank has volunteered in the IHHWS (Irish Hen Harrier Winter Survey) for ten years and worked as part of the HHP (Hen Harrier Project) monitoring team for six years. He has also volunteered as part of a hen harrier monitoring group for the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA since 2005, and was the co-ordinator for the SW region during the 2022 National Hen Harrier Survey. Frank also worked on the 2015 National Curlew Survey in the Munster region.

Role: Field surveyor.

Luíse Ní Dhonnabháin

Luíse is an experienced fieldworker that specialises in bird identification and surveying. She graduated from University College Dublin (UCD) in 2015 with a Zoology degree and since then has worked on various ornithological projects. She has previously worked for the Royal Society for the Prevention of Cruelty to Birds (RSPB) in Orkney, the Shetlands and along the east coast of Scotland where she carried out land and boat-based surveys of auks, kittiwakes, shags and cormorants, and upland surveys of skuas and gulls. She has also worked on Rockabill Island for six months as the island's Tern Warden. In addition to her many years of bird surveying experience, Luíse is skilled in collating and processing data, team-management, and writing reports.

Project Role: Field surveyor.

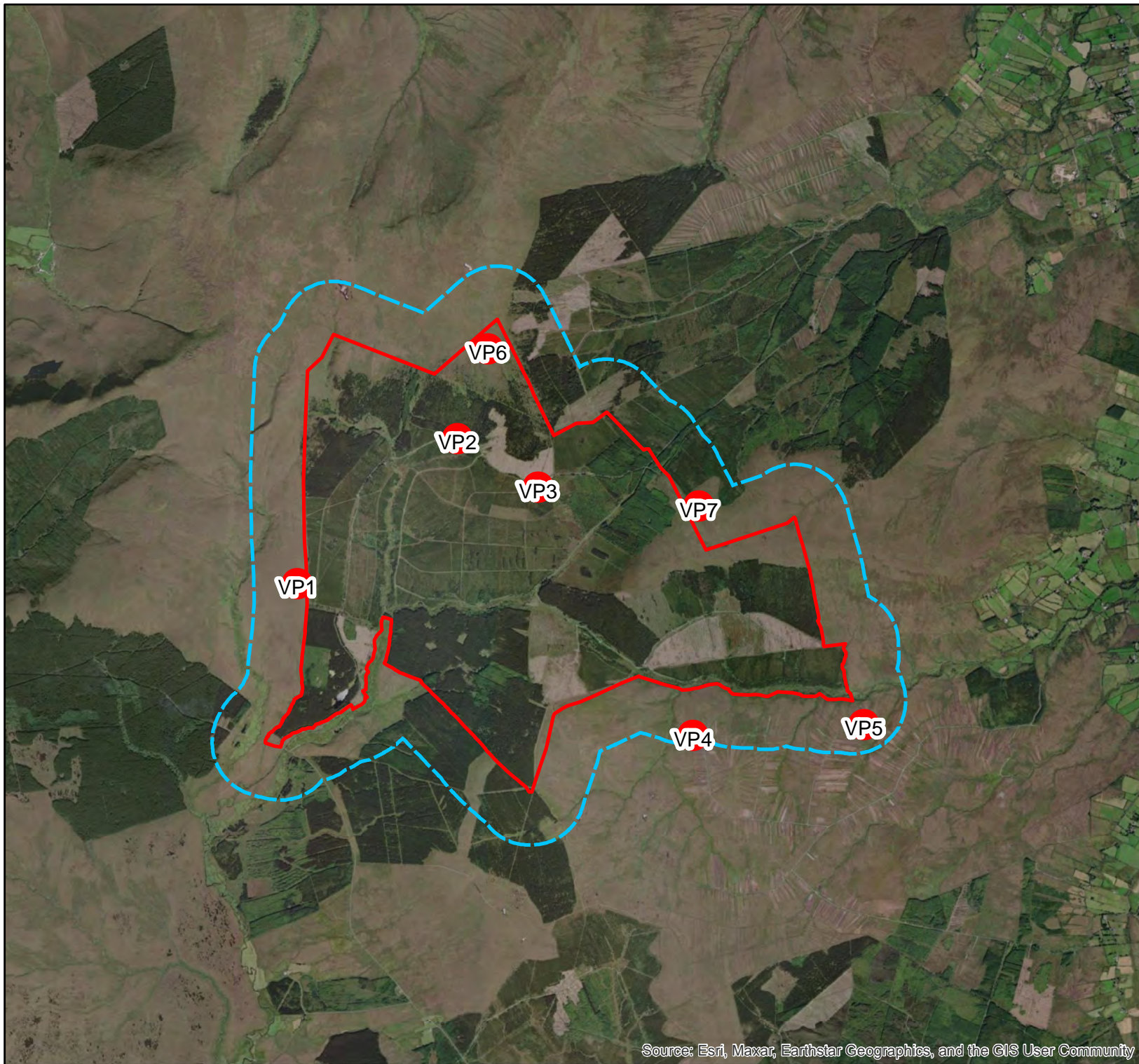
Valerie Heffernan

Valerie has worked as an environmental professional since graduating in 2015 and has been employed as an Environmental Scientist with MWP since 2018. She has considerable experience and has had input into a variety of projects including solar farms, marine and wind energy developments. She is experienced in GIS and planning and environmental report input.




Project Role: Responsible for viewshed analysis and flight path mapping.

Appendix 2

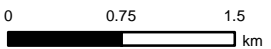
Survey and Viewshed Mapping



Legend

-  Vantage Point Locations
-  Site Boundary
-  Survey Area 500m Buffer

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Project Title:
Glenora Wind Farm

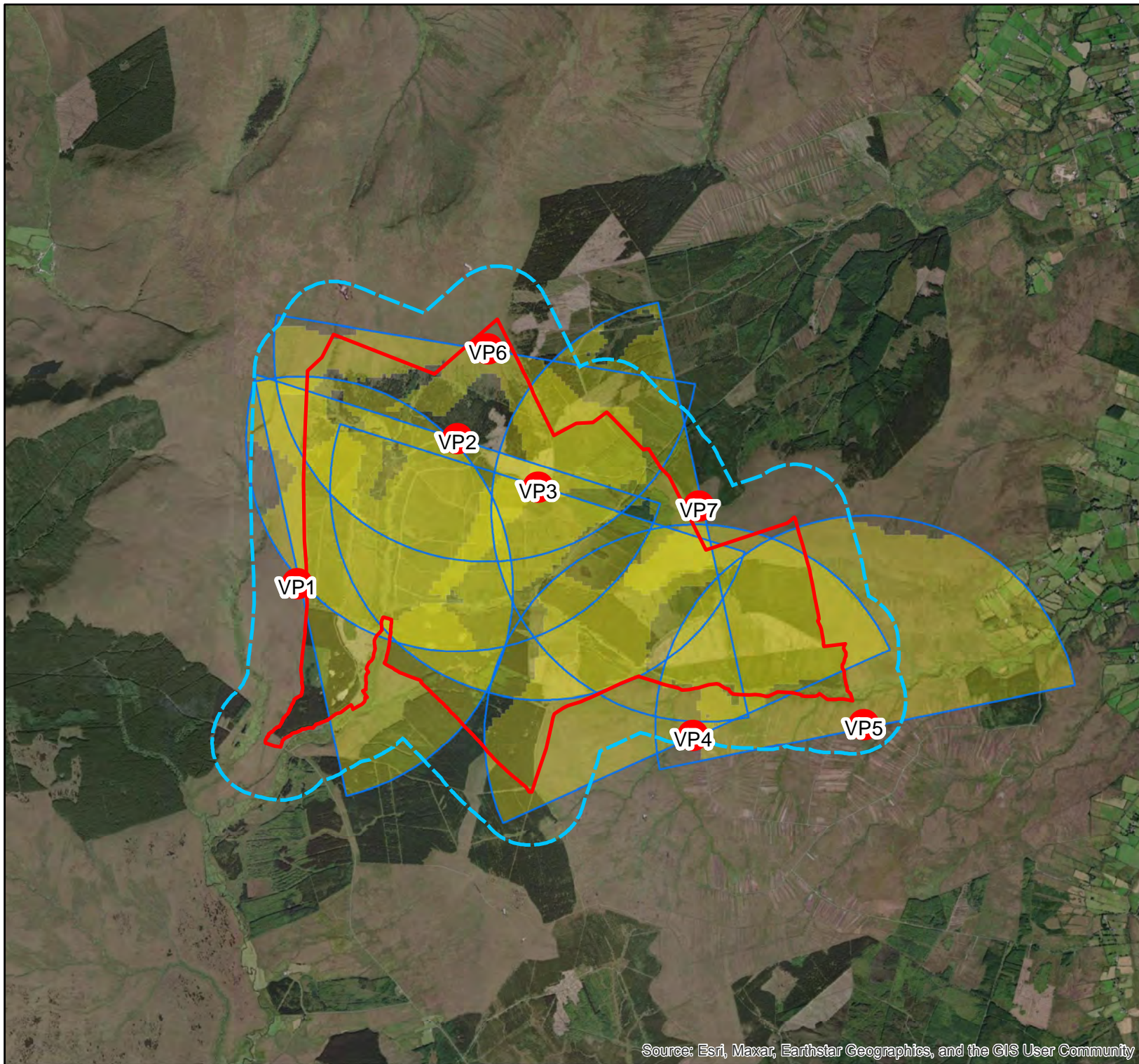
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Drawing Title:
Vantage Point Locations

Drawn: VH Checked: HD

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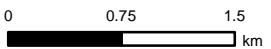




Legend

- Vantage Point Locations
- Site Boundary
- Survey Area 500m Buffer
- Viewshed Arc
- Viewshed Extent

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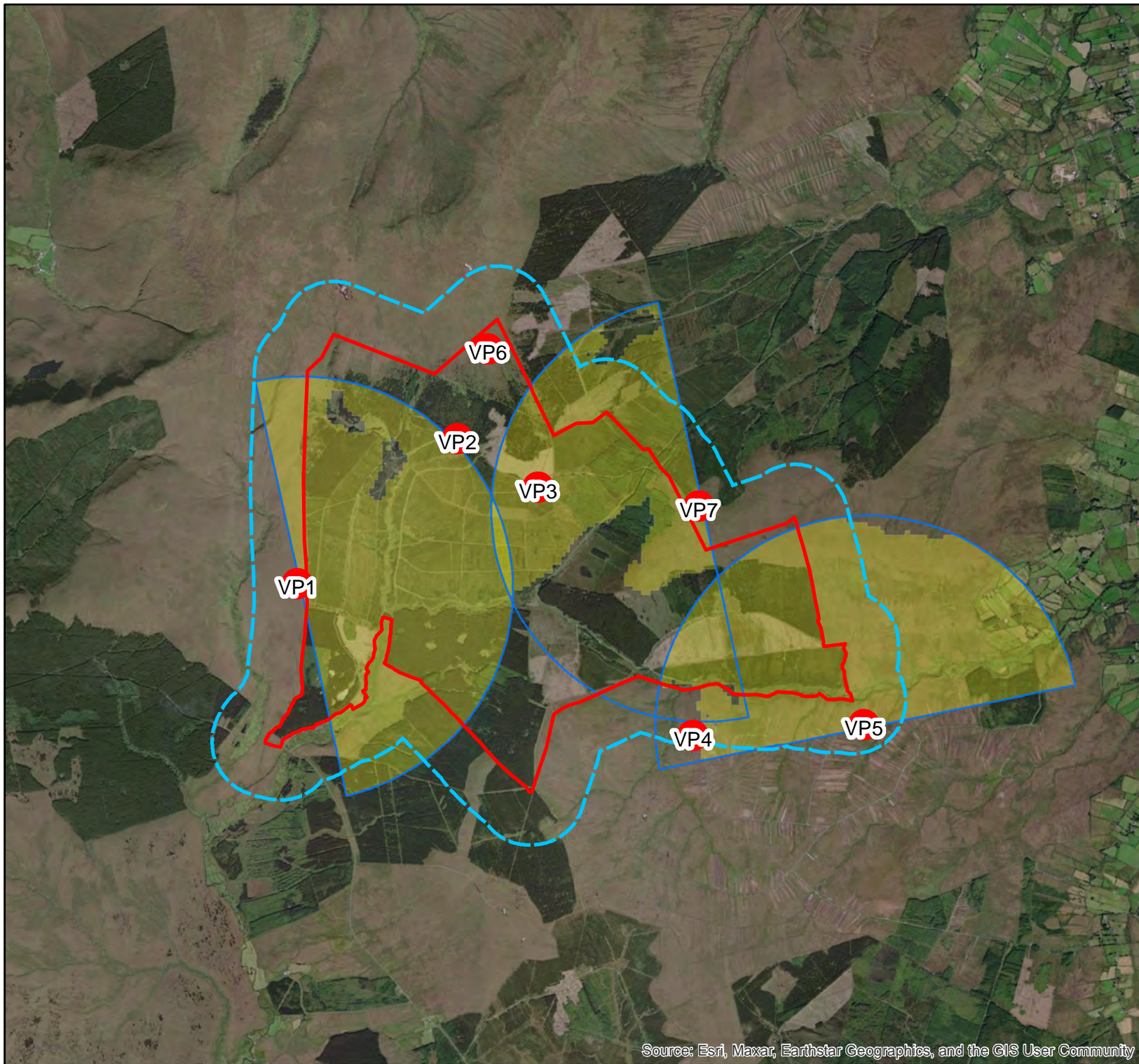
Project Title:
Glenora Wind Farm

Client: SSE Renewables Ireland Ltd

Drawing Title:
Viewshed Analysis
VPs 1 to 7

Drawn: VH	Checked: HD
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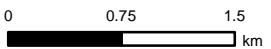




Legend

- Vantage Point Locations
- Site Boundary
- Survey Area 500m Buffer
- Viewshed Arc
- Viewshed Extent

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Project Title:
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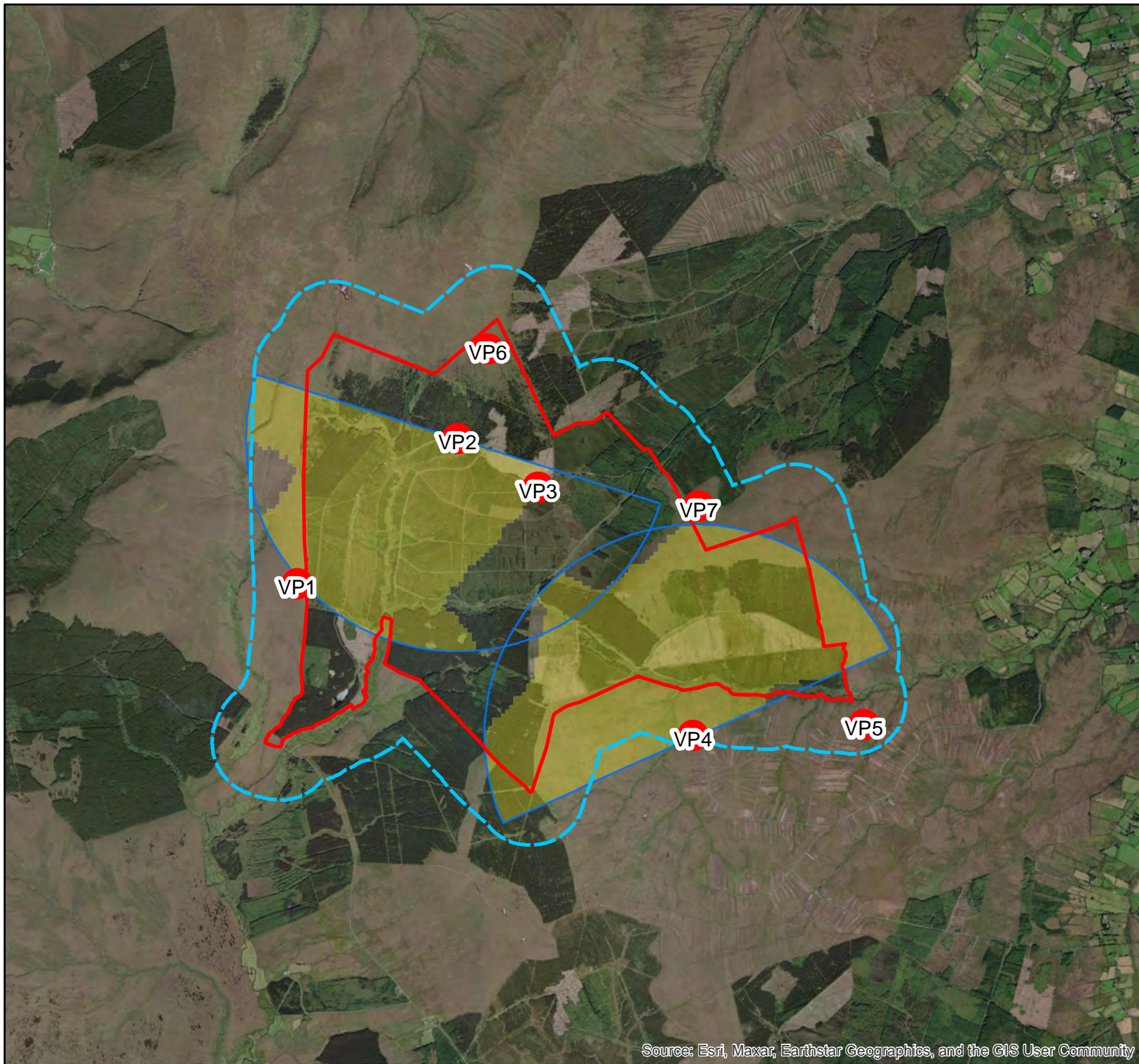
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Drawing Title:
Viewshed Analysis VPs
1,5,7

Drawn: VH **Checked:** HD

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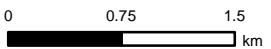




Legend

- Vantage Point Locations
- Site Boundary
- Survey Area 500m Buffer
- Viewshed Arc
- Viewshed Extent

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Project Title:
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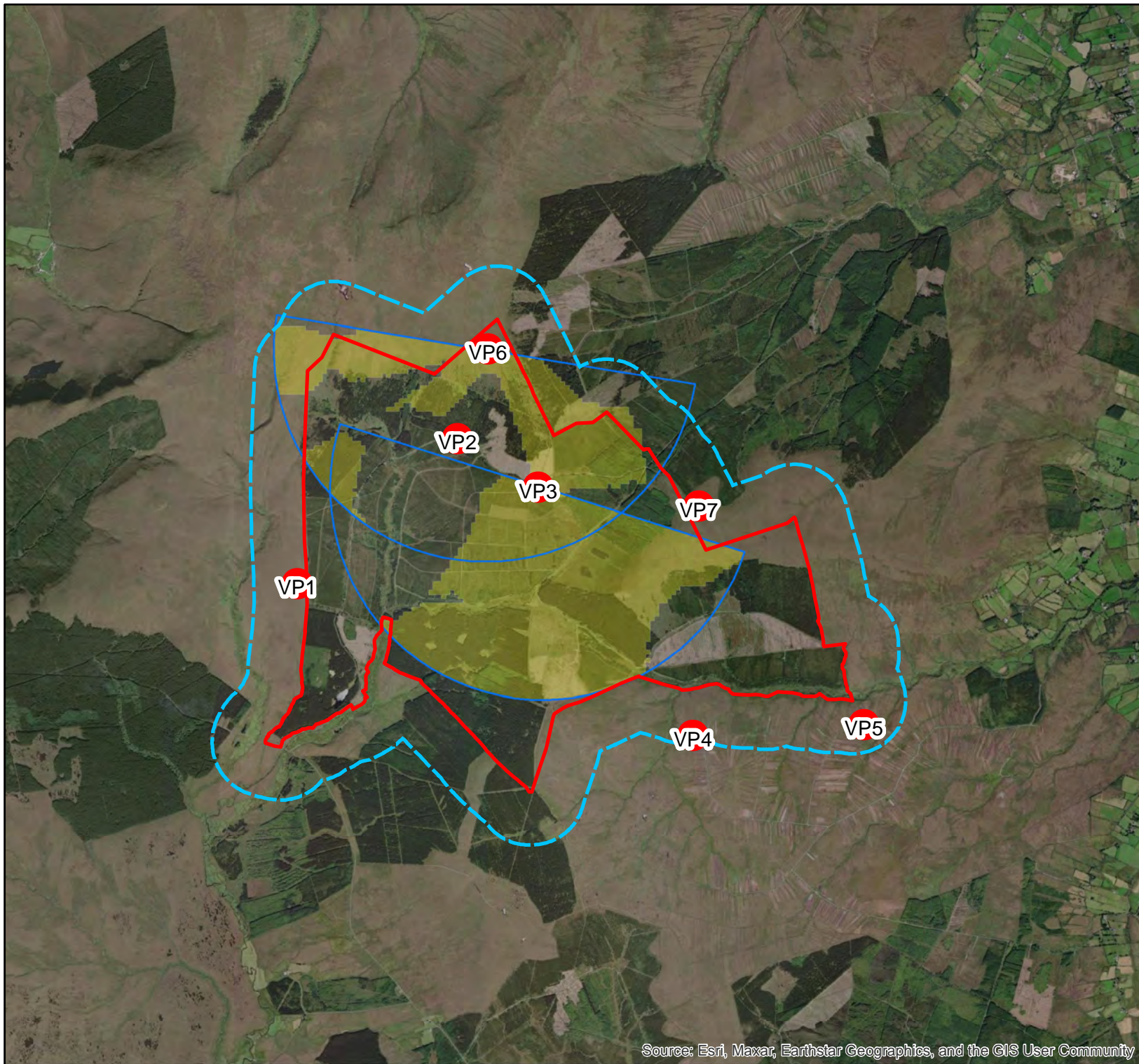
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Drawing Title:
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VPs 2,4

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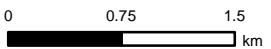




Legend

- Vantage Point Locations
- Site Boundary
- Survey Area 500m Buffer
- Viewshed Arc
- Viewshed Extent

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Project Title:
Glenora Wind Farm

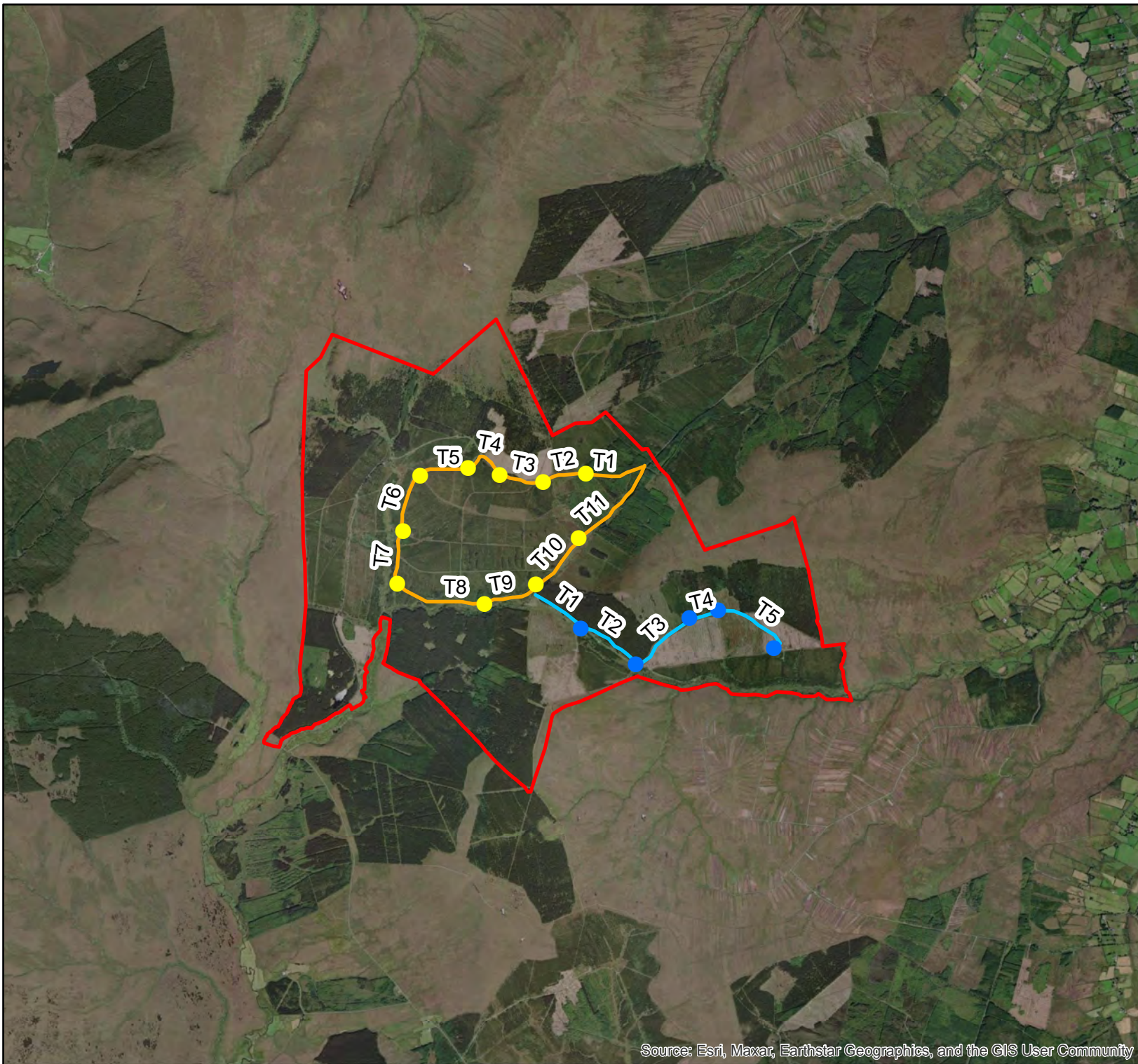
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Drawing Title:
Viewshed Analysis
VPs 3,6

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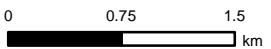




Legend

- Site Boundary
- Point Count
- Point Count
- Transect A
- Transect B

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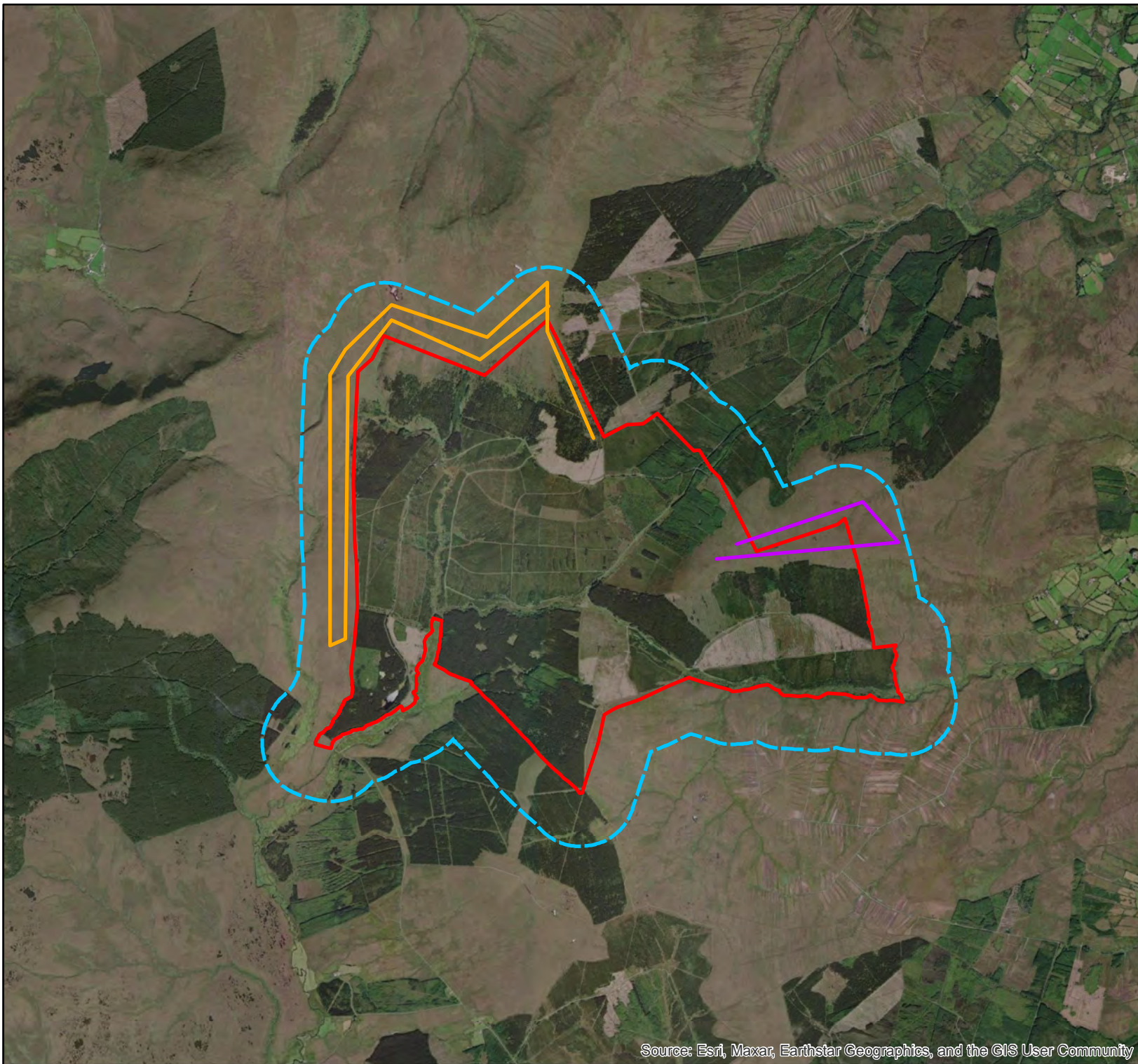
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Glenora Wind Farm

Client: SSE Renewables Ireland Ltd

Drawing Title:
Transect and Point Count Surveys

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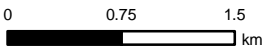




Route

- Route A
- Route B
- Site Boundary
- Survey Area 500m Buffer

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Project Title:
Glenora Wind Farm

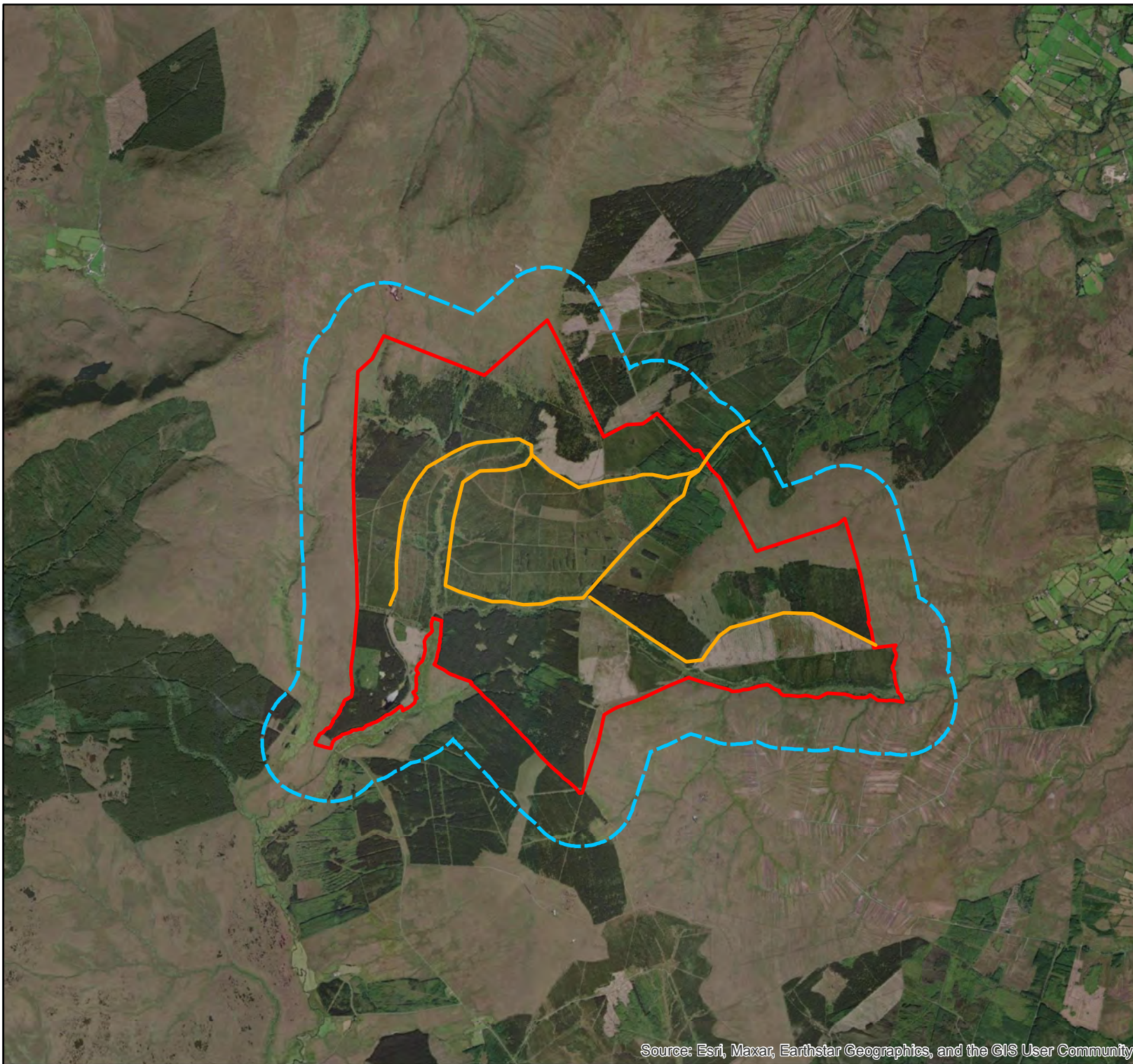
Client: SSE Renewables Ireland Ltd




Drawing Title:
Breeding/Winter Season Walkover Surveys

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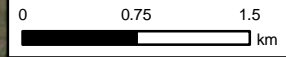
Date: 29/08/2023 **Scale (A4):** 1:50,000





-  Nocturnal survey route 2019
-  Site Boundary
-  Survey Area 500m Buffer

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Project Title:
Glenora Wind Farm

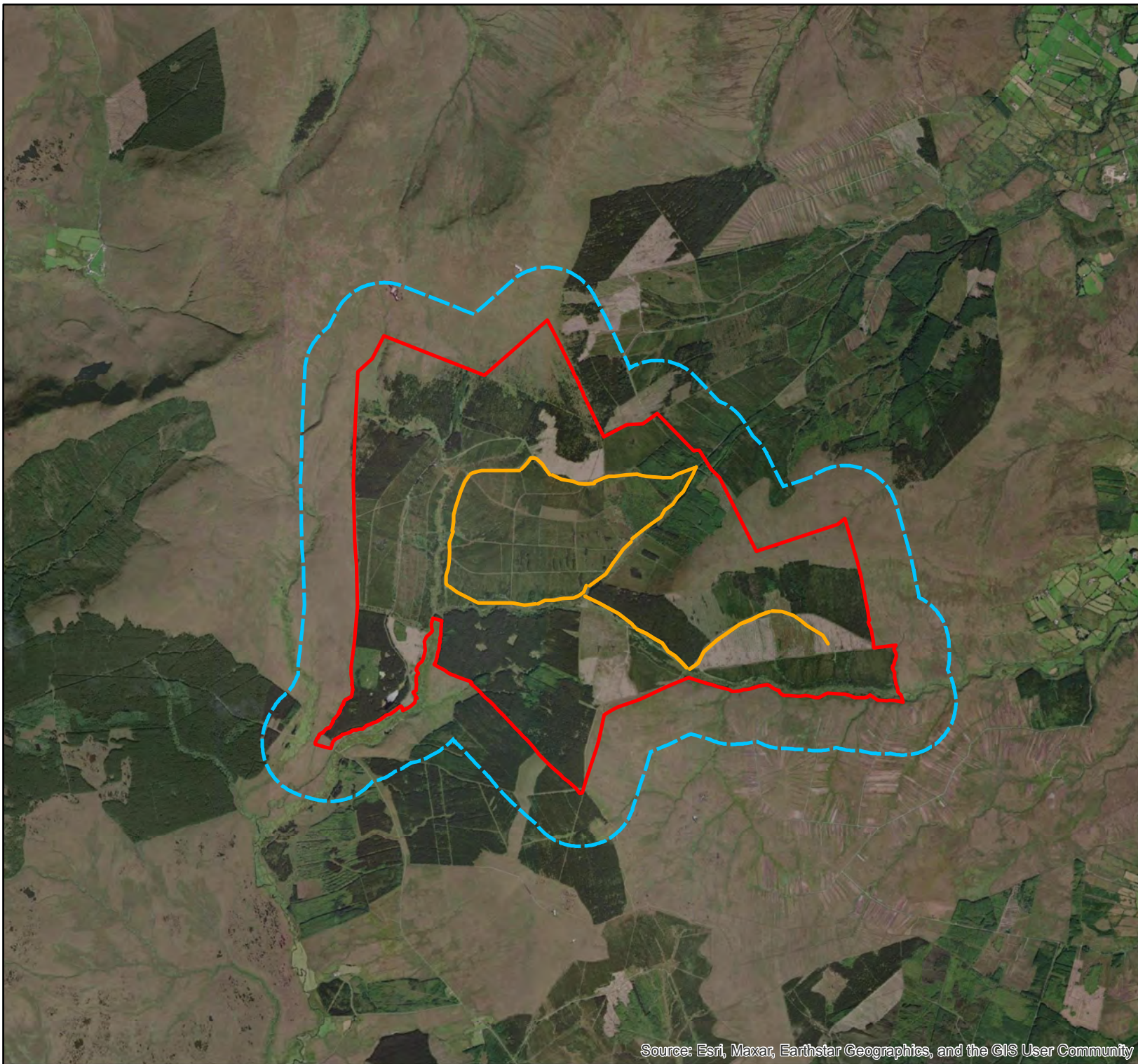
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Drawing Title:
Nocturnal Breeding Surveys 2019

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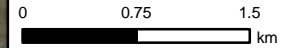
Date: 29/08/2023 Scale (A4): 1:50,000





-  Nocturnal survey route 2021, 2022
-  Site Boundary
-  Survey Area 500m Buffer

Map Reproduced From Ordnance Survey Ireland
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CYAL50261645.



Project Title:
Glenora Wind Farm

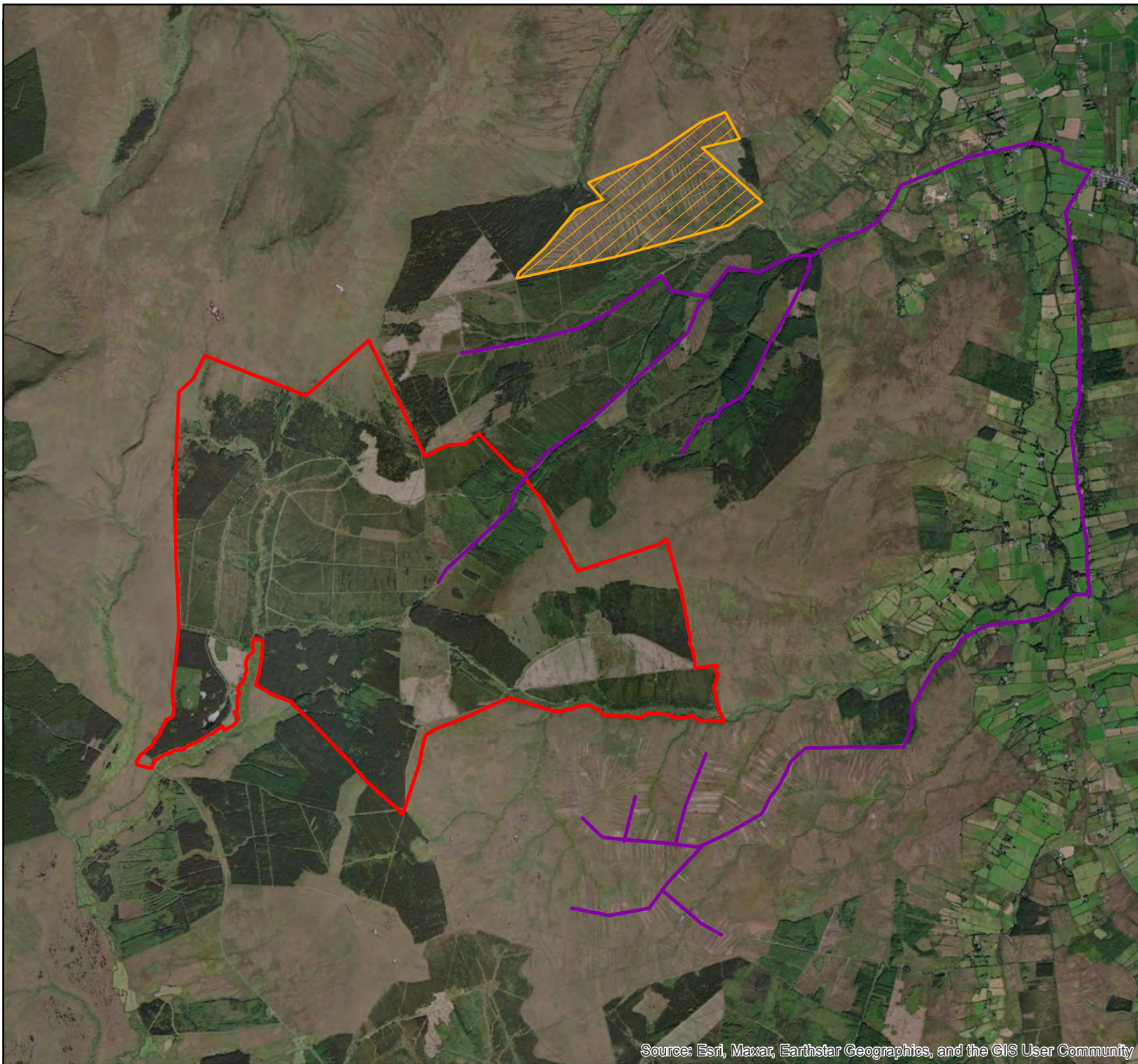
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Nocturnal Breeding Surveys 2021 & 2022

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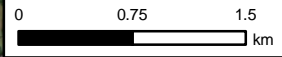
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-  Cutover Bog Driven Transect
-  Cutover Bog Survey Area
-  Site Boundary

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Project Title:
Glenora Wind Farm

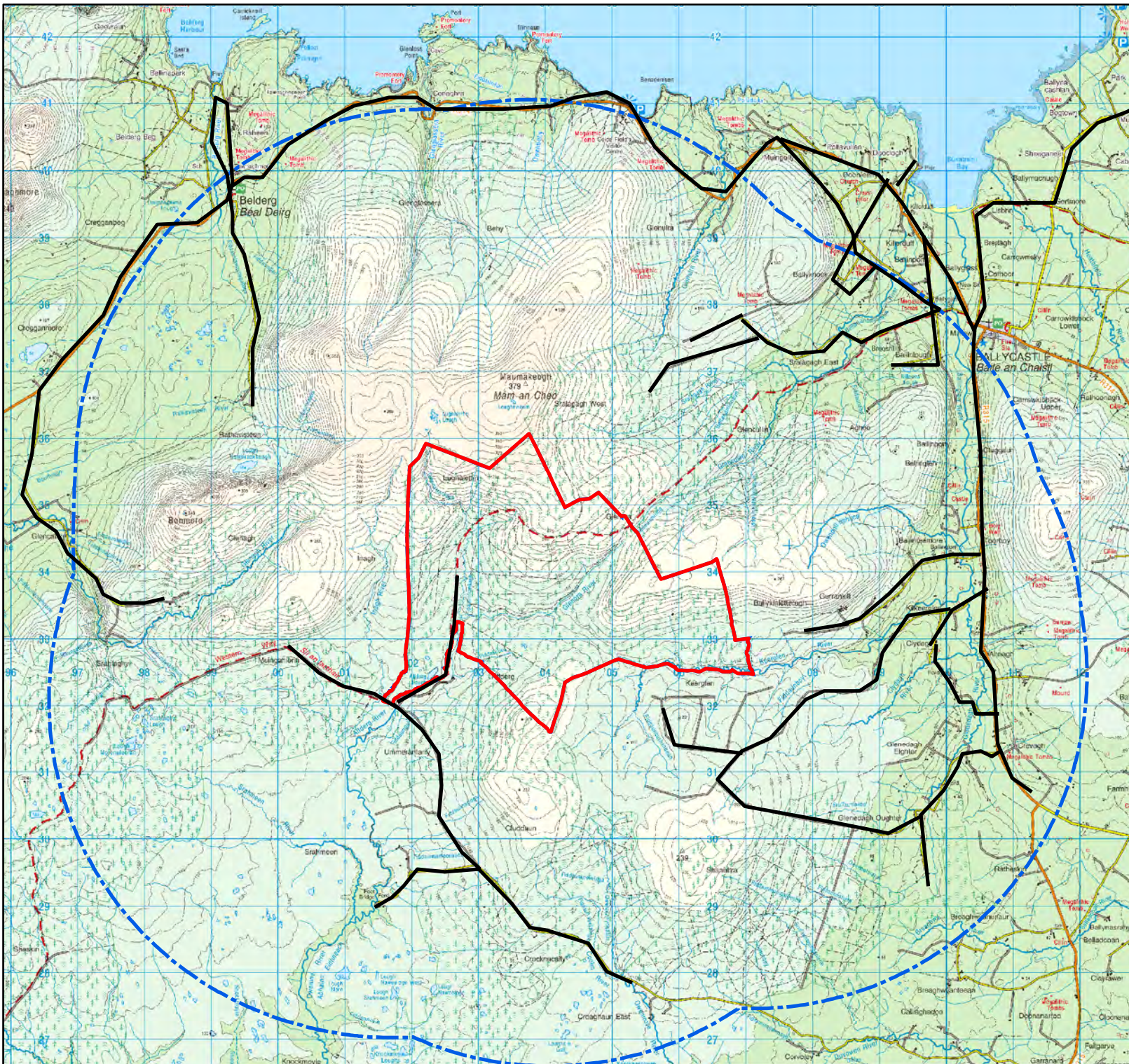
Client: SSE Renewables Ireland Ltd

Drawing Title:
Hinterland Survey Breeding 2019

Drawn: VH Checked: HD

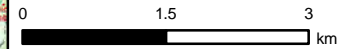
Date: 29/08/2023 Scale (A4): 1:50,000





-  Hinterland Survey
-  Site Boundary
-  Glenora 5km Buffer

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Project Title:
Glenora Wind Farm

Client: SSE Renewables Ireland Ltd






Drawing Title:
Driven Hinterland Survey
Breeding 2021, Breeding 2022
Winter 2021/22, Winter 2022/23

Drawn: VH Checked: HD

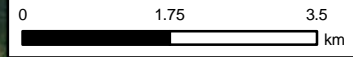
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-  Downpatrick Head
Transect
-  Ballycastle Strand /
Bunrathair Bay
-  Downpatrick Head
-  Site Boundary
-  Glenora 5k Buffer

Map Reproduced From Ordnance Survey Ireland
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Project Title:
Glenora Wind Farm

Client: SSE Renewables Ireland Ltd

Drawing Title:
Wider Hinterland Surveys

Drawn: VH	Checked: HD
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Date: 30/08/2023	Scale (A4): 1:90,000
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Appendix 3

Vantage Point Survey Summary

Vantage Point Survey Overall Summary

Survey Year/Season	Summer (Apr – Sept)							Winter (Oct – Mar)							Total Hours
	VP1	VP2	VP3	VP4	VP5	VP6	VP7	VP1	VP2	VP3	VP4	VP5	VP6	VP7	
Year 1 (April 2019 to March 2020)	35*	36	36	36	36	35*	39	36	36	36	36	36	36	36	505
Year 2 (April 2020 to March 2021)	36	36	36	36	36	36	36	36	36	36	36	36	36	36	504
Year 3 (April 2021 to March 2022)	36	36	36	36	36	36	36	36	36	36	36	36	36	36	504
Year 4 (April 2022 to March 2023)	36	33*	33*	36	36	36	36	36	36	36	36	36	36	36	498

*denotes where less than the minimum 36 hours per VP per season was achieved

Vantage Point Survey Seasonal Summaries

Breeding 2019

Breeding April 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	18/04/2019	JM	09:30	12:30	3	A fine day with hazy sunshine, temp 12-18C, wind f2-5, wind direction east south-east, visibility ok- good
1	18/04/2019	SC	13.00	15.00	2	Clear blue skies, sunshine, temp 17-18C, wind direction south south-east f2, visibility moderate/good.
2	16/04/2019	JM	10:30	13:30	3	A dry morning with low cloud cover with some prolonged sunny periods, temp 11-14°C, wind direction east f4-5, wind speed f2, visibility good
2	10/04/2019	SC	14.00	17.00	3	Cloud cover 4/8, intermittent sunshine and cloud, wind f1-3, wind direction south easterly to east south-east, visibility excellent.
3	16/04/2019	JM	14.00	17.00	3	A dry morning with low cloud cover and some prolonged periods of sunshine, temp 11-14C, wind direction east south-east, wind f2-4-5, visibility good
3	16/04/2019	SC	10:30	13:30	3	Cloud cover 8/8 to 4/8, overcast later giving way to intermittent sunshine and cloud, temp 12-14C, wind f2-4, wind direction south-east visibility excellent.
4	17/04/2019	JM	10.00	13.00	3	A dry morning with some bright periods, temp 12C, wind south south-east f2-5, visibility good
4	17/04/2019	SC	13.30	16.30	3	Cloud cover 7/8, mostly overcast, temp 14-16C, wind direction southeast f 3-5, visibility good.
5	17/04/2019	JM	13.30	16.30	3	A dry morning & day with some bright periods, temp 12C, wind south south-east f2-5, visibility good.
5	17/04/2019	SC	10.00	13.00	3	Cloud cover 7/8, overcast, windy and cold, temp 9-12C, wind f3-5, wind direction south-east, visibility good.
6	18/04/2019	JM	13.00	15.00	2	A fine day with hazy sunshine, temp 12-18C, wind east south-east f 2-5, visibility ok to good.
6	18/04/2019	JM	09.30	12.30	3	Cloud cover 2/8, hazy sunshine, temp 12-17C, wind f2-5, wind direction south-east, visibility moderate.
7	21/05/2019	SC	05:45	11:45	6	Cloud cover 5/8, frost on ground at start, mostly sunny, temp 8-13C, wind f0-1, wind direction north-east, visibility good.

Breeding May 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	21/05/2019	AC	06.00	09.00	3	Cloud cover 3/8 – 8/8, intermittent sunshine, temp 4-11C, wind calm, temp 13C, visibility good.
1	21/05/2019	AC	09.10	12.10	3	Cloud cover 5/8, intermittent sunshine, temp 11-13C, wind northeast f1-2, visibility good.
2	24/05/2019	AC	05.45	08.45	3	Cloud cover 5/8, temp 10-13C, mist, fog, rain, south-west wind f2-4, visibility poor.
2	20/05/2019	SC	14.45	17.45	3	Cloud cover 5/8, mostly sunny with a cold breeze, temp 14-13C, wind f2-3 gusts of f4 north north-west, visibility very good.
3	20/05/2019	AC	14.45	17.45	3	Cloud cover 6/8 – 7/8, sunshine, temp 16-14C, northwest wind f2-3, visibility good.
3	24/05/2019	SC	05.45	08.45	3	Cloud cover 8/8, dense fog, misty rain, temp 12-13C, south-west to west-south-west wind f1-2, visibility poor.
4	02/05/2019	AC	05.45	08.45	3	Cloud cover 8/8, temp 8-11°C, east north-east wind f1-2, visibility good.
4	23/05/2019	AC	08.50	11:50	3	Cloud cover 5/8, hazy sunshine, temp 12-14C, south wind f0-1 and 2-3 (from 10:00), visibility good.
5	22/05/2019	AC	09:10	12:10	3	Cloud cover 8/8, hazy sunshine, temp 12-14C, south-east wind f1-2, visibility good.
5	23/05/2019	AC	05:30	08:30	3	Cloud cover 8/8, light rain to 06: 30 Hrs, temp 9-12C, south wind f0-1, visibility good.
6	22/05/2019	SC	05.45	08.45	3	Cloud cover 5/8 – 8/8, sunny to begin, getting overcast, clear and cool, temp 9-10C, east-south-east wind f1-2, visibility very good to good.
6	22/05/2019	SC	09:15	12:15	3	Cloud cover 8/8, overcast, temp 10-14C, east-south-east wind f1-2, visibility good.
7	20/05/2019	SC	05.45	08.45	3	Cloud cover 8/8, overcast, some light rain, temp 10-11C, south to south-east wind f0, visibility good.
7	23/05/2019	SC	09:15	12:15	3	Cloud cover 8/8, overcast, temp 12-13C, south-east to south-south-east wind f0-1, visibility good.

Breeding June 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	14/06/2019	JC	20:00	23:00	3	Cloud cover 8/8, temp 11-10C, wind south-west f 2-3, visibility good.
1	14/06/2019	JC	17:00	20:00	3	Cloud cover 8/8, dry, temp 11-10C, wind south-west f2-3, visibility good.
2	17/06/2019	SC	20:00	23:00	3	Cloud cover 7/8, mostly overcast, some showers, south-west wind, temp 12-10C, visibility good
2	19/06/2019	SC	17:00	20:00	3	Cloud cover 8/8 – 5/8, overcast some showers giving way to sunny spells, temp 11-10C, wind west f2-3, visibility good.
3	17/06/2019	JC	20:00	23:00	3	Cloud cover 7/8, light intermittent rain, wind south-west f2-4, temp 12-10C visibility good.
3	21/06/2019	SC	12:00	15:00	3	Cloud cover 7/8, temp 13C, wind f1-0, north north-east to north visibility good.
4	18/06/2019	SC	09:00	12:00	3	Cloud cover 8/8-6/8, mostly overcast with occasional sunny spells and showers, temp 13C, south-west wind f3-4 gusts f5, visibility good.

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
4	18/06/2019	SC	12:15	15:15	3	Cloud cover 8/8, overcast, showers, temp 14C, south-west wind f3-4, visibility good.
5	18/06/2019	JC	09:00	12:00	3	Cloud cover 8/8, overcast light intermittent rain, south-west wind f3-4, temp 13C, visibility good.
5	18/06/2019	JC	12:15	15:15	3	Cloud cover 8/8, light intermittent rain, south-west, wind south-west f3-4, temp 14C, visibility good.
6	20/06/2019	JC	20:00	23:00	3	Cloud cover 6/8, sunshine, temp 12-8C, west wind f2-3, visibility good.
6	20/06/2019	JC	17:00	20:00	3	Cloud cover 6/8, sunshine, temp 12-8C, west wind f2-3, visibility good.
7	20/06/2019	SC	17:00	23:00	6	Cloud cover 6/8, mixture of sunny spells and cloud, temp 12-8C, west wind f2-4, visibility good.

Breeding July 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	05/07/2019	SC	13:00	19:00	6	Cloud cover 7/8 to 5/8, mostly overcast, humid, warm giving way to sunny spells, temp 19C, wind f1-3 west-south-west to south-west visibility good.
2	17/07/2019	AC	06:00	09:00	3	Cloud cover 8/8, temp 13-14C, south wind f 4-5, visibility poor.
2	17/07/2019	AC	09:15	12:15	3	Cloud cover 8/8, constant rain and mist, south wind f4-5, temp 14-16C visibility poor.
3	16/07/2019	AC	06:15	09:15	3	Cloud cover 5/8, sunshine, temp 14-16C, wind south south-west f 2-3, visibility good.
3	16/07/2019	AC	09:30	12:30	3	Cloud cover 7/8, intermittent sunshine, temp 16-18C, wind south south-west f2-3, wind south-west f 3-4, visibility good
4	15/07/2019	AC	12:15	15:15	3	Cloud cover 8/8, intermittent hazy sunshine, temp 16-19C, wind south south-west f 2-3, visibility good.
4	15/07/2019	AC	15:30	18:30	3	Cloud cover 8/8, intermittent hazy sunshine, temp 20-19C, south-west wind f2-3, visibility good.
5	15/07/2019	JC	12:00	15:00	3	Cloud cover 6/8, haze and sunny spells, wind f1-2, wind southwest, temp 19C, visibility good.
5	15/07/2019	JC	15:15	18:15	3	Cloud cover 4/8, haze and sunny spells, wind f1-2, wind southwest, temp 19C, visibility good.
6	16/07/2019	SC	06:15	12:15	6	Cloud cover 4/8 to 8/8, sunshine, warm and hazy temp 13-19C, wind f2-4, south to south-west, visibility moderate to good.
7	16/07/2019	JC	06:15	12:15	6	Cloud cover 5/8, temp 13-19C, south-west wind f2-4, visibility moderate to good.
7	21/07/2019	JC	09:30	12:30	3	Cloud cover 5/8, temp 19C, south-west wind f2-4, visibility moderate to good.

Breeding August 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	20/08/2019	AC	15:30	18:30	3	Cloud cover 8/8, light rain and showers, temp 16-15C, wind westerly f3-5, visibility good.
1	20/08/2019	AC	18:40	21:40	3	Cloud cover 8/8 to 4/8, light rain showers and intermittent sunshine, temp 15-12C, wind westerly f3-4 and south-west 3-4 from 19:25 and f1-2 from 20:30, visibility good.
2	19/08/2019	AC	15:40	18:40	3	Cloud cover 7/8, rain showers, intermittent sunshine, temp 14-12C, wind westerly f5-6, visibility moderately good.
2	19/08/2019	SC	18:50	21:50	3	Cloud cover 8/8 to 7/8, mostly cloudy some showers and some sunny spells, wind west f3, temp 12C and visibility good.
3	19/08/2019	AC	18:50	21:50	3	Cloud cover 8/8, intermittent sunshine and rain showers, temp 12C, wind westerly f5-6, visibility moderately good to good.
3	19/08/2019	SC	15:40	18:40	3	Cloud cover 6/8, cloudy with some sunny spells, some showers heavy at times, wind westerly f3-4 gusts f5, temp 14-12C visibility good.
4	21/08/2019	AC	18:35	21:35	3	Cloud cover 7/8, intermittent sunshine, wind west to south-west f4-5, temp 16-13C, visibility good.
4	22/08/2019	SC	15:15	18:15	3	Cloud cover 8/8, overcast, strong winds, regular showers, wind south-west f5-6, temp 16C, visibility moderate.
5	21/08/2019	AC	15:20	18:20	3	Cloud cover 7/8, intermittent sunshine, wind west-south-west f 4-5, temp 16C and visibility good.
5	22/08/2019	SC	18:30	21:30	3	Cloud cover 8/8, overcast, persistent rain strong winds, rain eventually stopping after two hours, wind south - west f5-6, temp 16-14C, visibility moderate.
6	20/08/2019	SC	15:15	18:15	3	Cloud cover 8/8-7/8, mostly overcast, some showers, some sunny spells, wind west f3-4, gusts f5, temp 16C, visibility moderate.
6	20/08/2019	SC	18:30	21:30	3	Cloud cover 7/8, cloud with some sunny spells, cold, wind west-south-west to south -west f5-4, temp 15-12C, visibility moderate.
7	21/08/2019	SC	15:15	18:15	3	Cloud cover 6/8 to 4/8, mostly cloudy with some sunny spells and odd showers, wind west-south -west f3-5, temp 15-14C, visibility good.
7	21/08/2019	SC	18:30	21:30	3	Cloud cover 5/8, mixture of cloud and sunny spells, wind west-south –west to south-west f3-5, temp 14-11C, visibility good.

Breeding September 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	18/09/2019	SC	11:00	14:00	3	Cloud cover 1/8, sunshine clear blue skies, warm, wind south –south-west to west-south-west f0-1, temp 16-18C, visibility very good.
1	18/09/2019	SC	14:15	17:15	3	Cloud cover 3/8, mostly sunny, blue skies, wind north-west f1-2, temp 12-16C, visibility good.
2	19/09/2019	SC	09:00	12:00	3	Cloud cover 0/8, clear blue skies, sunshine, wind south-south-east f0-1, temp 14-18C, visibility good.
2	17/09/2019	SC	09:45	12:45	3	Cloud cover 3/8mostly sunny, some patches of cloud, east wind f0-1, temp 13-15C, visibility very good.
3	19/09/2019	SC	12:15	15:15	3	Cloud cover 0/8, clear blue skies, sunshine, warm, wind south-south-east f1-2, temp 19-20C, and visibility very good.
3	17/09/2019	JC	11:00	14:00	3	Cloud cover 1/8, sunshine, south-west wind f0-1, temp 16-18C and visibility good.
4	19/09/2019	SC	16:50	19:50	3	Cloud cover 1/8, clear blue skies, sunshine, warm, wind south-south-east f0-1, temp 19-20C, and visibility very good.
4	20/09/2019	JC	09:30	11:30	3	Cloud cover 1/8, sunny, wind south –east f4-5, temp 14-13C, visibility good.
5	20/09/2019	SC	09:00	12:00	3	Cloud cover 0/8, clear blue skies, wind south –east f4-6, temp 18C, visibility very good.
5	19/09/2019	JC	16:30	19:30	3	Cloud cover 7/8, wind west f1-2, temp 15-14C, visibility good.
6	18/09/2019	JC	10:55	13:55	3	Cloud cover 4/8, sunny, glare, wind south –west f1, temp 15-18C, visibility good.
6	18/09/2019	JC	14:25	17:25	3	Cloud cover 4/8, sunny, glare, wind southwest f1, temp 18C, visibility good.
7	19/09/2019	JC	12:00	15:00	3	Cloud cover 3/8, sunny, wind south –west f0-2, temp 15-14C, visibility good.
7	19/09/2019	JC	08:45	11:45	3	Cloud cover 3/8, wind south –west f0-1, temp 15-19C, visibility good.

Winter 2019/20Winter October 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	15/10/2019	JC	10:25	13:25	3	Light rain and fog, temp 9-12C, wind f3-5, wind direction SW visibility good- moderate.
1	15/10/2019	SC	14:00	17:00	3	Cloud cover 8/8, overcast and cool, temp 12C, wind direction SSE f3-4, visibility good.
2	18/10/2019	JC	19:15	12:15	3	Cloud cover 7/8, continuous heavy fog for first 60minutes, temp 9-12C, wind direction N f1-3, visibility moderate/good.
2	18/10/2019	SC	09:25	12:25	3	Cloud cover 8/8 fog, cold, improving occasional sunshine and some showers, wind f0-1, wind direction NE-NNE, visibility poor- moderate.
3	18/10/2019	JC	12:35	15:35	3	Cloud cover 7/8, dry, temp 9-12C, wind direction N, wind f1-2, visibility moderate/good.
3	18/10/2019	SC	12:40	15:40	3	Cloud cover 7/8, dry, overcast with some clear spells, temp 10C, NNE f0-2, visibility moderate
4	17/10/2019	JC	13:30	16:30	3	Intermittent heavy rain, sunny spells, temp 9-12C, wind f3-4, wind direction SW, visibility moderate/excellent.
4	11/10/2019	SC	10:00	13:00	3	Cloud cover 8/8 – 6/8, overcast, showers, hail at times, some sunny spells, temp 9-12C, wind direction S f 3-5, visibility moderate.
5	17/10/2019	JC	10:00	13:00	3	Intermittent heavy rain, sunny spells, temp 9-12C, wind f3-4, wind direction SW, visibility moderate/excellent.
5	17/10/2019	SC	13:50	16:50	3	Cloud cover 6/8 – 8/8, mostly cloudy, some sunshine and some heavy long-lasting showers, temp 12-11C, wind f2-5, wind direction S-SSE, visibility good/ moderate.
6	16/10/2019	JC	14:30	17:30	3	Cloud cover 6/8, dry, temp 10-12C, wind SW f3-5, visibility good.
6	16/10/2019	JC	11:15	14:15	3	Cloud cover 6/8, dry, temp 10-12C, wind f3-5, wind direction SW, visibility good.
7	16/10/2019	SC	11:15	14:15	3	Cloud cover 3/8, blue skies sunshine, cold breeze, temp 11-12C, wind f3-5, wind direction SW, visibility good.
7	16/10/2019	SC	14:30	17:30	3	Cloud cover 4/8 – 8/8, intermittent sunshine and cloud until 16:50 when it rained heavily until 17:30, temp 11C, wind f3-5 gusts of F6, wind direction SSW, visibility good.

Winter November 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	19/11/2019	JC	10:15	13:15	3	Cloud cover 5/8, dry, temp 8C, wind f2-3, wind direction N, visibility good excellent.
1	19/11/2019	SC	14:00	17:00	3	Cloud cover 5/8, mostly cloudy with some sunny spells, temp 8-6C, wind direction SE f1-3, visibility good.
2	18/11/2019	JC	14:00	17:00	3	Cloud cover 8/8, temp 3C, wind direction SE f2-3, visibility good.
2	18/11/2019	SC	14:15	17:15	3	Cloud cover 8/8, overcast, cold, temp 3C wind f2-3, wind direction SE, visibility poor- moderate.
3	22/11/2019	JC	09:10	12:10	3	Cloud cover 8/8, continuous heavy rain, temp 7-8C, wind direction ENE, wind f2-4, visibility poor.
3	22/11/2019	SC	09:10	12:10	3	Cloud cover 8/8, continuous rain for the duration of the VP, temp 7-8C, wind direction ENE, wind f2-4, visibility poor.
4	20/11/2019	JC	13:50	16:5	3	Cloud cover 8/8, light intermittent rain, temp 8C, wind direction SE, wind f2-4, visibility moderate – good.
4	20/11/2019	SC	10:15	13:15	3	Cloud cover 8/8, overcast some light misty rain, temp 8C, wind direction SE f2-4, visibility moderate.
5	20/11/2019	JC	15:15	13:15	3	Cloud cover 8/8, light intermittent rain, temp 8C, wind direction SE, wind f2-4, visibility moderate – good.
5	20/11/2019	SC	13:50	16:50	3	Cloud cover 7/8, overcast until 16:10 when it cleared lightly until 16:50, temp 8-7C, wind f2-4, wind direction SE, visibility good.
6	21/11/2019	SC	10:25	13:25	3	Cloud cover 8/8, dense fog and continuous rain for duration of VP, temp 7C, wind f2-4, wind direction ESE, visibility poor.
6	21/11/2019	SC	13:25	16:35	3	Cloud cover 8/8, dense fog and continuous rain for duration of VP, temp 7C, wind f2-4, wind direction ESE, visibility poor.
7	22/11/2019	JC	09:10	12:10	3	Cloud cover 8/8, continuous heavy rain, temp 7-8C, wind f2-4, wind direction ENE, visibility poor.
7	21/11/2019	JC	13:25	16:35	3	Continuous heavy rain, fog and mist, temp 7C, wind f2-7, wind direction ESE, visibility very poor.

Winter December 2019

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	19/12/2019	SC	10:00	13:00	3	Cloud cover 6/8 – 4/8, mostly cloudy with some sunny spells to start to mostly sunny with some cloud, temp 8C, wind f3-5, wind direction SSE visibility good.
1	19/12/2019	JC	12:45	15:45	3	Cloud cover 6/8, sunshine, temp 4-6C, wind direction SE f2-4, visibility good.
2	18/12/2019	SC	09:30	12:30	3	Cloud cover 8/8, overcast, continuous rain, heavy at times, strong winds, temp 6-9C, wind direction SE, wind f5-7, visibility poor.
2	18/12/2019	JC	13:45	16:45	3	Cloud cover 8/8 fog, continuous heavy rain and fog, wind f5-7, wind direction SE, visibility poor.
3	18/12/2019	SC	12:45	15:45	3	Cloud cover 8/8, dense fog, persistent heavy rain and strong winds, temp 4-6C, wind direction SE, wind f5-6, visibility very poor
3	18/12/2019	SC	10:30	13:30	3	Cloud cover 8/8, continuous heavy rain and fog, temp 6-8C, SE f5-7, visibility poor
4	16/12/2019	SC	11:00	17:00	6	Cloud cover 8/8- 4/8, some showers early on giving way to intermittent sunshine and cloud, temp 6-4C, wind f2-3, wind direction SW, visibility good.
5	16/12/2019	JC	11:00	14:00	3	Cloud cover 8/8, intermittent heavy rain, temp 2-5C, wind f3-5, wind direction E, visibility poor-good.
5	16/12/2019	JC	14:10	17:10	3	Cloud cover 8/8, intermittent heavy rain, temp 2-5C, wind f3-5, wind direction E, visibility poor-good.
6	17/12/2019	JC	09:30	12:30	3	Cloud cover 5/8, sunshine, dry, temp 6-8C, wind f2-3, wind direction E, visibility good/excellent.
6	17/12/2019	JC	12:40	15:40	3	Cloud cover 5/8, sunshine, dry, temp 6-8C, wind f2-3, wind direction E, visibility good/excellent.
7	17/12/2019	SC	10:00	13:00	3	Cloud cover 3/8, mostly sunny with some cloud, temp 3-6C, wind f0-1, wind direction SSW, visibility good.
7	17/12/2019	SC	13:15	16:15	3	Cloud cover 3/8, mostly sunny, temp 6-4C, wind f0-1, wind direction SSW, visibility good.

Winter January 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	21/01/2020	SC	09:35	12:35	3	Cloud cover 8/8, low cloud, mist, and misty rain, temp 9C, wind f2-3, wind direction SW-WSW visibility poor.
1	21/01/2020	JC	13:15	16:15	3	Cloud cover 7/8, temp 7-9C, wind direction SW, wind f3-4, visibility good/ moderate.
2	20/01/2020	SC	14:00	17:00	3	Cloud cover 8/8, overcast, windy, dry, temp 8C, wind direction SW, wind speed f4-6, visibility moderate.
2	24/01/2020	JC	09:30	12:30	3	Continuous heavy fog and mist, intermittent light rain, clear for last 30 minutes of VP, temp 8-10C, wind f3-4, wind direction SSW, visibility poor-good.
3	24/01/2020	SC	09:40	12:40	3	Cloud cover 8/8, dense fog, breezy, misty rain until 12:00 when fog and rain cleared improving visibility to good, temp 7-9C, wind direction SW, wind f2-4, visibility very poor-good.
3	20/01/2020	JC	14:00	17:00	3	Cloud cover 8/8, dry, temp 10C, wind direction SW, wind f4-5, visibility good.
4	23/01/2020	SC	13:55	16:55	3	Cloud cover 7/8, mostly cloudy with regular misty rain showers, temp 8-6C, wind f2-3, wind direction SW, visibility good-moderate
4	23/01/2020	JC	14:10	17:10	3	Intermittent mist, temp 8-10C, wind direction SW, wind f 2-4, visibility moderate-good.
5	23/01/2020	SC	10:40	13:40	3	Cloud cover 8/8 – 6/8, dense fog, breezy, misty rain until 12:30 when fog lifted and visibility improved, temp 6-8C, wind f2-3, wind direction SW, visibility poor/moderate- good.
5	23/01/2020	JC	11:00	14:00	3	Cloud cover 8/8 – 8/8, intermittent heavy mist, temp 7-9C, wind f2-4, wind direction SW, visibility moderate- good.
6	22/01/2020	SC	10:00	13:00	3	Cloud cover 8/8, overcast with dense fog, clearing at times, temp 8-10C, wind SW f1-2, visibility moderate/poor.
6	22/01/2020	SC	13:15	16:15	3	Cloud cover 8/8, dense fog, clearing at times to give better views, overcast, temp 10-8C, wind f1-2, wind direction WSW-SW, visibility poor/moderate.
7	22/01/2020	JC	10:20	13:20	3	Cloud cover 8/8, continuous heavy fog and light intermittent mist, temp 6C, wind f2-3, wind direction SW, visibility moderate-poor.
7	22/01/2020	JC	13:30	16:30	3	Cloud cover 8/8, continuous heavy fog and light intermittent mist, temp 6C, wind f2-3, wind direction SW, visibility moderate-poor.

Winter February 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	18/02/2020	JC	14:30	17:30	3	Cloud cover 8/8, intermittent heavy hail, temp 3-4C, wind direction SW, wind f5-8, visibility poor-moderate.
1	18/02/2020	SC	11:15	14:15	3	Cloud cover 3/8-7/8, strong winds, mixture of sunshine and cloud with heavy sleet and hail showers, temp 5C, wind direction W, wind f5, visibility good.
2	17/02/2020	SC	12:15	15:15	3	Cloud cover 6/8, strong winds some sleet showers, sunny spells, temp 5C, wind direction W, wind speed f6-8, visibility moderate.
2	17/02/2020	SC	16:45	14:45	3	Cloud cover 8/8, intermittent heavy hail, temp 5-7C, wind direction WSW, wind f5-7, visibility moderate-poor.
3	17/02/2020	JC	13:30	16:30	3	Cloud cover 8/8, intermittent heavy hail, temp 5-7C, wind direction WSW, wind f5-7, visibility moderate-poor.
3	17/02/2020	SC	15:30	18:30	3	Cloud cover 7/8, strong winds, sunny spells, sleet/hail showers, wind direction W, wind f6-8, visibility moderate.
4	19/02/2020	JC	11:00	14:00	3	Cloud cover 8/8, continuous heavy rain, temp 3-5C, wind direction W, wind f6-8, visibility poor.
4	19/02/2020	SC	14:15	17:15	3	Cloud cover 8/8, continuous heavy rain, temp 3-5C, wind direction W, wind f6-8, visibility poor.
5	19/02/2020	SC	10:40	16:40	6	Cloud cover 8/8 fog, heavy persistent rain, strong winds, wind direction SSW-SW, wind f5-7 gusts f8, visibility poor.
6	20/02/2020	JC	13:45	16:45	3	Cloud cover 5/8, intermittent heavy snow and hail, temp 4C, wind direction W, wind speed f5-8, visibility poor-excellent.
6	20/02/2020	JC	10:00	13:00	3	Cloud cover 5/8, intermittent heavy snow and hail, temp 4C, wind direction W, wind speed f5-8, visibility poor-excellent.
7	20/02/2020	SC	13:15	16:15	3	Cloud cover 4-8-8/8, bright and sunny with long lasting, heavy sleet, hail and snow showers, snow on ground, temp 4C, wind direction W, wind speed f4-6 gusts f7, visibility good/poor.
7	20/02/2020	SC	10:00	13:00	3	Cloud cover 4/8-8/8, bright and sunny with heavy long-lasting snow, hail, sleet showers, snow on the ground, wind direction W, wind f4-6 gusts f7, visibility good/poor.

Winter March 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	27/03/2020	AC	11:50	14:50	3	Cloud cover 0/8, sunshine, temp 9-8C, wind direction NE, wind f4-5, visibility good.
1	27/03/2020	AC	15:00	18:00	3	Cloud cover 2/8, sunshine, temp 8-7C, wind direction NE, wind speed f5-6, visibility good.
2	23/03/2020	JM	12:45	15:45	3	Damp with some clear spells, temp 5-7C, wind direction W wind f4-5, shifted to SW, wind f5-6, visibility ok.
2	25/03/2020	SC	09:00	12:00	3	A misty damp wet morning, dry, temp 10C, slack winds, visibility poor.
3	23/03/2020	JM	09:30	12:30	3	A damp windy morning, wet, some clean dry periods, temp 5-7C, wind direction W, wind f3-5 shifted SW f5-6, visibility ok
3	25/03/2020	JM	12:15	15:15	3	A misty damp wet day, slack winds, temp 10C, wind visibility poor.
4	23/03/2020	AC	12:50	15:50	3	Cloud cover 8/8, rain showers, temp 8C, wind direction S, wind f4-5 to f5-6, visibility moderate.
4	25/03/2020	AC	09:30	12:30	3	Cloud cover 8/8, continuous mist and rain, temp 7-9C, wind direction N, wind speed f3-4, visibility poor
5	25/03/2020	AC	12:45	15:45	3	Cloud cover 8/8 continuous mist and rain, temp 8-7C wind direction N, wind f3-4, visibility poor.
5	23/03/2020	SC	09:30	12:30	3	Cloud cover 8/8, continuous rain, temp 7-8C, wind direction S, wind f4-5, visibility moderate.
6	06/04/2020	JM	09:00	15:00	6	A fine sunny bright day with good sunshine, temp 8-12C, light showers then, wind direction NW, wind speed f4-6, visibility good.
7	24/03/2020	JM	11:00	17:00	6	A fine cool sunny day, temp 8-10C, wind direction NE, wind speed f1-2 to f4, visibility good.

Breeding 2020

Breeding April 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	11/05/2020	JNM	08:30	15:00	6	A day, cold with some sunny periods, temp 4-7C, wind F3-4, wind direction N to NE, visibility good
2	06/05/2020	JNM	08:45	11:45	3	A fine dry sunny day, temp 12-19C, wind direction E, F1-3/4, visibility good
2	11/05/2020	JNM	15:30	18:30	3	A dull dry day with intermittent light shower, temp 10-12C, wind F3-5, wind direction E to SE, visibility good
3	06/05/2020	JNM	12:00	15:00	3	A fine dry sunny day, temp 12-19C, wind direction E to SE, F1-3/4, visibility good
3	07/05/2020	JNM	08:30	11:30	3	A dry morning with low cloud cover and intermittent light showers, temp 10-12C, wind F3-5, wind direction E to SE, visibility good
4	06/05/2020	AC	08:45	11:45	3	Cloud cover 6/8, sunshine, temp 12-16C, visibility good.
4	07/05/2020	AC	11:45	14:45	3	Cloud cover 8/8, intermittent sunshine and showers, temp 14C, wind direction SE, F4-5, visibility good.
5	06/05/2020	AC	12:05	15:05	3	Cloud cover 6/8, sunshine, temp 17-18C, wind direction E, F4-5 and SE F4-5 from 13:30, visibility good.
5	07/05/2020	AC	08:30	11:30	3	Cloud cover 8/8, intermittent sunshine and showers, temp 11-14C, wind direction SE, F4-5, visibility good.
6	08/05/2020	JNM	08:30	15:00	6	A dull dry day with low cloud cover, temp 6-8C, wind S to SW, F2-3-5, visibility good.
7	08/05/2020	AC	08:30	14:30	6	Cloud cover 8/8, rain showers, temp 15-16C, wind F3-4, wind direction SW, visibility good.

Breeding May 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	25/05/2020	AC	09:00	12:00	3	Cloud cover 8/8, temp 11-14C, wind F-64, wind direction S, visibility good.
1	27/05/2020	AC	12:15	15:15	3	Cloud cover 7/8, hazy sunshine, temp 18-21C, wind F3-4, wind direction SE, visibility good.
2	20/05/2020	AC	08:40	11:40	3	Cloud cover 8/8, hazy sunshine, temp 12-14C, wind F4-5, wind direction S to SE, visibility good.
2	22/05/2020	AC	11:50	14:50	3	Cloud cover 8/8, continuous heavy rain, stormy, temp 9-11C, wind F8-10, wind direction SW, visibility poor - moderate.
3	20/05/2020	AC	12:00	15:00	3	Cloud cover 8/8, hazy sunshine, temp 15-17C, wind F5-6, wind direction S, visibility good.
3	22/05/2020	AC	08:30	11:30	3	Cloud cover 8/8, continuous heavy rain, stormy, temp 9C, visibility poor.
4	20/05/2020	JNM	09:00	12:00	3	A dry clear sunny morning, temp 13-15C, wind direction S to SW, F1-3, visibility good.
4	22/05/2020	JNM	12:15	15:15	3	A very wet day with heavy showers and some clear spells, temp 10C, wind direction SW, gale force,

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
						visibility poor-moderate
5	20/05/2020	JNM	12:15	15:15	3	A dry clear sunny day, temp 13-15C, wind S to SW, F1-3, visibility good.
5	22/05/2020	JNM	09:00	12:00	3	Very wed day with heavy showers, temp 10C, wind direction SW, gale force winds, visibility poor-moderate
6	27/05/2020	JNM	08:30	15:00	6	A warm dull day with some slight haze, temp 14-18C, wind F-3, wind direction SE, visibility good
7	25/05/2020	JNM	09:00	15:30	6	A dry day, temp 10-14C, wind direction SW, F1-5, visibility good

Breeding June 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	19/06/2020	AC	09:00	12:00	3	Cloud cover 8/8, temp 10-14C, wind direction WSW, F3-4, visibility good
1	22/06/2020	AC	12:00	15:00	3	Cloud cover 8/8, intermittent hazy sunshine, continuous rain from 13:00, temp 14C, wind direction WSW, F4-5, visibility moderate
2	15/06/2020	JNM	08:30	11:30	3	A foggy morning, temp 12-16C, wind direction N, slack winds, visibility bad
2	19/06/2020	JNM	12:00	15:00	3	A damp still day with some showers, temp 10C, slack, visibility good
3	15/06/2020	JNM	11:45	14:45	3	A foggy day, lifting and dropping throughout the watch, temp 12-16C, slack winds, visibility poor
3	19/06/2020	JNM	08:30	11:30	3	A damp still morning with some showers, temp 10C, winds slack, visibility good
4	15/06/2020	AC	12:00	15:00	3	Cloud cover 8/8-7/8, fog until 13:13, intermittent hazy sunshine from 13:30, temp 15-17C, wind direction N, F3-4, visibility poor to moderated from 13:30
4	17/06/2020	AC	08:45	11:45	3	Cloud cover 8/8, temp 12-13C, wind direction N, F3-4, visibility moderated
5	15/06/2020	AC	08:30	11:30	3	Cloud cover 8/8, continuous mist and fog, temp 13-14C, wind direction N, F3-4, visibility poor
5	17/06/2020	AC	12:15	15:15	3	Cloud cover 8/8, intermittent hazy sunshine from 14:00, temp 13-14C, wind direction N, F3-4, visibility moderate to good
6	22/06/2020	JNM	12:00	15:00	3	A wet afternoon with heavy showers, temp 13-14C, wind direction SW, F4-6, visibility moderate to poor
6	24/06/2020	JNM	09:00	12:00	3	A fine dry sunny morning, temp 14-17C, wind direction SW, F1-4, visibility good
7	22/06/2020	JNM	08:30	11:30	3	A misty damp morning, some sunny spells, temp 13-14C, wind direction SW, F4-6, visibility moderate
7	24/06/2020	JNM	12:30	15:30	3	A fine dry sunny day, temp 14-17C, wind direction SW, F1-4, visibility good

Breeding July 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	27/07/2020	AC	09:00	12:00	3	Cloud cover 6/8 - 7/8, intermittent sunshine, temp 11 -14C, wind direction NW, F4-5, visibility good
1	27/07/2020	JK	12:15	15:15	3	Sunny spells with intermittent showers, some heavy showers, temp 12-14C, wind direction N-NW, visibility good
2	24/07/2020	AC	08:30	11:30	3	Cloud cover 8/8, heavy rain from 10:50, temp 12-13C, wind direction S-SE, F3-4, visibility good to poor from 10:50
2	24/07/2020	JK	12:00	15:00	3	Overcast, rain heavy at times, temp 14-16C, wind direction S-SE, F4-5, visibility moderate to good
3	24/07/2020	JK	08:30	11:30	3	Cloudy, rain heavy from 10:50 to 11:20, temp 12-14C, wind direction S-SE, F5, visibility good
3	24/07/2020	AC	12:00	15:00	3	Cloud cover 8/8, continuous rain and mist, temp 13 -14C, wind direction S-SE, F4-5, visibility moderate to poor
4	22/07/2020	AC	09:10	12:10	3	Cloud cover 8/8, continuous rain and mist, temp 15 -16C, wind direction SW, F3-4 F4—5 from 11:00, visibility poor
4	22/07/2020	JK	12:30	15:30	3	Nice day, partially cloudy with sunny spells, temp 16-17C, wind direction W-SW, F5, visibility good
5	22/07/2020	JK	09:00	12:00	3	Overcast, mist, some showers, temp 15C, wind direction W-SW, 5, visibility moderated to good
5	22/07/2020	AC	12:40	15:40	3	Cloud cover 8/8, intermittent sunshine, temp 16-17C, wind direction W, F4-5, visibility good
6	29/07/2020	JNM	09:30	15:30	6	A dry windy day with showers, temp 13-16C, wind direction SW-S, F2-5, visibility good
7	27/07/2020	JK	08:30	11:30	3	Overcast, mist and drizzle, temp 11-12C, wind direction N-NW, visibility moderate to good
7	27/07/2020	AC	12:45	15:45	3	Cloud cover 7/8-8/8, intermittent sunshine, heavy rain showers, temp 16-15C, wind direction W, F4-5, visibility good and poor during showers

Breeding August 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	24/08/2020	AC	09:00	12:00	3	Cloud cover 8/8, intermittent sunshine, mist until 10:00, temp 14-17C, wind direction S, F0-1 and F1-2 from 10:00, visibility moderate to good from 10:00
1	24/08/2020	JNM	12:30	15:30	3	A misty damp day with some bright sunny spells in the afternoon, temp 14-18C, wind direction E, slack winds, visibility moderate
2	24/08/2020	PC	09:00	12:00	3	Wet misty dull morning, cleared to sunny day during mid-morning, temp 12C, wind direction SE, F1, visibility moderate
2	24/08/2020	AC	12:30	15:30	3	Cloud cover 8/8, temp 17C, wind direction S-SE, F2-3, visibility good

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
3	24/08/2020	JNM	09:00	12:00	3	A misty damp day, temp 14-18C, slack winds, wind direction E, visibility moderate
3	24/08/2020	PC	12:30	15:30	3	Dry bright afternoon, wind direction SE, F1-2, temp 16C, visibility good
4	27/08/2020	PC	12:45	15:45	3	Dull, constant light showers that cleared up in the evening, temp 12C, wind direction E, F2-3, visibility moderated
4	27/08/2020	AC	09:15	12:15	3	Cloud cover 8/8, temp 13C, wind direction E, F2-3, visibility moderated
5	27/08/2020	PC	09:15	12:15	3	Dull and damp, light showers constant, temp 12C, wind direction SE, F1, visibility moderated
5	27/08/2020	AC	12:45	15:45	3	Cloud cover 8/8, constant rain, temp 14-15C, wind direction E F 2-3 and NE F2-3, visibility moderate
6	28/08/2020	PC	09:00	15:00	6	A very wet day with constant showers, temp 12C, wind direction NE, F2-4, visibility poor
7	28/08/2020	JNM	09:00	15:00	6	A very wet morning with constant showers that cleared in the afternoon, temp 14-12C, wind direction NE, F2-4, visibility poor

Breeding September 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	25/09/2020	AC	09:00	12:00	3	Cloud cover 6/8, sunshine and light rain, temp 9-12C, wind direction N, F4-5, visibility good
1	25/09/2020	PC	12:00	15:00	3	Cool, sunny day with light rain, temp 12C, wind direction NW, F2-3, visibility good
2	21/09/2020	PC	12:30	15:30	3	Dry dull day, cloudy, bright and sunny in afternoon, temp 13C, wind direction WSW, F2-3, visibility moderate
2	23/09/2020	PC	09:00	12:00	3	A dry cool, sunny morning, temp 6C, wind direction SW, F1, visibility good
3	21/09/2020	PC	09:00	12:00	3	Dry dull cool and cloudy day, temp 11C, wind direction WSW, F2-3, visibility moderate
3	23/09/2020	PC	12:30	15:30	3	A dry sunny day, temp 13C, wind direction SW, F1, visibility good
4	21/09/2020	AC	08:45	11:45	3	Cloud cover 8/8, temp 12-13C, wind direction SW, F3-4, visibility good
4	23/09/2020	AC	12:15	15:15	3	Cloud cover 6/8, sunshine, temp 12-13C, wind direction SW, F2-3, visibility good.
5	21/09/2020	AC	12:15	15:15	3	Cloud cover 8/8 – 7/8, temp 14-15C, wind direction SW, F3-4, visibility good
5	23/09/2020	AC	08:45	11:45	3	Cloud cover 6/8, sunshine, temp 7-12C, wind direction SW, F2-3, visibility good
6	30/09/2020	PC	09:00	15:00	6	A dull cloudy day with light showers, temp 12C, wind direction NW, F2-3, visibility moderate
7	30/09/2020	JK	09:00	15:00	6	Mostly cloudy, some sunny spells and periodic showers, temp 12-15C, wind direction W-NW, F4-5, visibility good

Winter 2020/21Winter October 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	27/10/2020	JC	09:00	12:00	3	Cloud cover 4/8-6/8, rain showers and sunshine, temp 9-10C, wind direction SW F4-5, visibility good.
1	28/10/2020	PC	08:45	11:45	3	Dull with persistent light rain, temp 7C, wind direction WSW, F3-4, visibility moderate.
2	21/10/2020	PC	09:00	12:00	3	Cloud cover 8/8, wet, dull and misty morning, temp 8C, wind direction N- NW, f1-3, visibility poor.
2	27/10/2020	PC	12:15	15:15	3	Bright, sunny day with intermittent showers of rain, wind direction SW, F4-5, visibility good
3	21/10/2020	PC	12:30	15:30	3	Wet, dull, misty, cloudy day with constant showers, temp 12C, wind direction N, F2-3, visibility poor
3	23/10/2020	PC	08:30	11:30	3	Cool, bright morning with intermittent rain showers, temp 5C, wind direction SW, F2, visibility moderate
4	21/10/2020	AC	08:55	11:55	3	Cloud cover 8/8, continuous rain, temp 9C, wind direction N, F4-6, visibility moderate to poor
4	23/10/2020	AC	12:10	15:10	3	Cloud cover 6/8, intermittent sunshine and showers of rain, temp 8-9C, wind direction SW, F3-4, visibility good
5	21/10/2020	AC	12:25	15:25	3	Cloud cover 8/8, continuous rain, temp 9C, wind direction N, F5-6, visibility poor to moderate
5	23/10/2020	AC	08:40	11:40	3	Cloud cover 5/8, intermittent sunshine and showers of rain, temp 6-8C, wind direction SW, F2-4, visibility good
6	23/10/2020	PC	12:30	15:30	3	Dry, dull and cloudy with sunny spells, temp 7C, wind direction SE, F4-5, visibility good
6	27/10/2020	PC	08:45	11:45	3	Bright, sunny morning, some showers at end of watch, temp 7C, wind direction SW, F4-5, visibility good
7	27/10/2020	AC	12:45	15:45	3	Cloud cover 6/8 – 8/8, intermittent sunshine and showers of rain, temp 10-9C, wind direction SW, F4-6, visibility good –poor during showers
7	28/10/2019	AC	08:40	11:40	3	Cloud cover 6/8, intermittent sunshine and showers of rain, temp 6-9C, wind direction SW, F4-5, visibility good–poor during showers

Winter November 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	25/11/2020	AC	12:15	15:15	3	Cloud cover 7/8, intermittent sunshine, temp 8-7C, wind direction NW, F3-4, visibility good
1	27/11/2020	AC	08:50	11:50	3	Cloud cover 8/8, light rain showers, temp 6-7C, wind direction S, F3-4, visibility good
2	20/11/2020	PC	08:30	11:30	3	Wet, windy and misty, temp 10C, wind direction SW, F3-5, visibility poor
2	20/11/2020	PC	12:00	15:00	3	Consistent rain, mist, temp 11C, wind direction SW, F4-5, visibility poor
3	23/11/2020	PC	08:30	11:30	3	Wet, cloudy, dull, consistent showers, temp 7C, wind direction SW, F3-4, visibility poor
3	25/11/2020	PC	12:10	15:10	3	A dry sunny day, cloudy, with intermittent light showers, temp 10C, wind direction SW, F2, visibility good
4	20/11/2020	AC	08:45	11:45	3	Cloud cover 8/8, continuous mist and rain, temp 10-11C, wind direction SW, F4-5, visibility poor
4	23/11/2020	AC	12:10	15:10	3	Cloud cover 8/8, continuous rain, temp 10-11C, wind direction SW, F5-6, visibility poor
5	20/11/2020	AC	12:15	15:15	3	Cloud cover 8/8, continuous mist and rain, temp 11C, wind direction SW, F4-6, gusts F6, visibility poor
5	23/11/2020	AC	08:35	11:35	3	Cloud cover 8/8, continuous mist and rain, temp 7-10C, wind direction SW, F4-5, S-SW, F4-6 from 10:00, visibility poor
6	22/11/2020	PC	11:30	14:30	3	Dry, dull and cloudy, temp 7C, wind direction SE, F2-3, visibility moderate
6	25/11/2020	PC	08:40	11:40	3	Dry, sunny with intermittent light showers, temp 9C, wind direction SW, F2, visibility good
7	23/11/2020	PC	12:00	15:00	3	Dull, misty, with consistent light showers and cloudy, temp 11C, wind direction SW, F4-5, visibility poor
7	25/11/2020	AC	08:45	11:45	3	Cloud cover 7/8, intermittent sunshine and rain showers, temp 5-8C, wind direction NW, F3-4, visibility good

Winter December 2020

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	16/12/2020	AC	09:00	12:00	3	Cloud cover 8/8, rain and mist, temp 7C, wind direction W, F4-5, visibility poor
1	18/12/2020	AC	12:00	15:00	3	Cloud cover 6/8-7/8, rain showers and sunshine, temp 8-9C, wind direction SW, F4-5, visibility good
2	14/12/2020	PC	08:45	11:45	3	Dry dull day, cloudy, bright and some heavy showers, temp 6C, wind direction S, F34, visibility moderate
2	21/12/2020	PC	12:30	15:30	3	A dull, cloudy, wet, misty and foggy day, temp 13C, wind direction SW, F2-3, visibility poor
3	16/12/2020	PC	12:30	15:30	3	Wet, windy, intermittent dry spells, cloudy day and cleared up at end of watch, temp 8C, wind direction SSW, F3-5, visibility moderate
3	21/12/2020	PC	09:00	12:00	3	A dull, cloudy, wet, misty morning, foggy, temp 8C, wind direction SE, F2-3, visibility poor
4	14/12/2020	AC	09:00	12:00	3	Cloud cover 8/8, rain showers, intermittent sunshine, temp 7-8C, wind direction S, F3-4, visibility good
4	14/12/2020	LOD	12:20	15:20	3	Cloud cover 8/8, intermittent sunshine, rain showers, temp 8-7C, wind direction S, F4-5, visibility good
5	14/12/2020	LOD	08:50	11:50	3	Overcast, showers throughout, temp 8C, wind direction SSE, F4, visibility good and moderate during showers
5	14/12/2020	AC	12:30	15:30	3	Cloud cover 8/8, intermittent sunshine, rain showers, temp 8-7C, wind direction S, F4-5, visibility good
6	14/12/2020	PC	12:15	15:15	3	Mostly dry, cloudy, sunny with intermittent showers, temp 8C, wind direction SSW, F4-5, visibility moderate
6	18/12/2020	PC	08:45	11:45	3	Dull, cloudy, wet, and misty morning, temp 8C, wind direction SW, F3-4, visibility moderate
7	16/12/2020	PC	09:00	12:00	3	Wet, cloudy and misty morning, temp 7C, wind direction S, F3-4, visibility moderate
7	16/12/2020	AC	12:30	15:30	3	Cloud cover 8/8 – 7/8, rain showers, intermittent sunshine, temp 6-7C, wind direction WSW, F4-5, visibility moderate

Winter January 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	27/01/2021	AC	09:00	12:00	3	Cloud cover 8/8, hazy sunshine to 10:40 and heavy fog after, temp 6-7C, wind direction SE, F2-3, visibility <150m to poor after 10:40
1	27/01/2021	AC	12:30	15:30	3	Cloud cover 8/8, heavy fog, temp 8-7C, wind direction SE, F2-3, visibility poor
2	25/01/2021	LOD	09:00	12:00	3	Dry except for snow showers between 10:00 - 11:00, temp 0C, no wind, visibility good
2	27/01/2021	PC	12:30	15:30	3	A dry, dull, cloudy day with heavy fog, temp 8C, wind direction SE, F1, visibility poor
3	25/01/2021	LOD	12:30	15:30	3	Intermittent rain and snow showers and bright spells in between, temp 0C, wind direction SW, F3-4, visibility moderate

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
3	27/01/2021	PC	09:00	12:00	3	Dry, dull, cloudy, fog moved in from 10:30, temp 5C, wind direction SE, F1, visibility good and poor from 10:30
4	21/01/2021	LOD	09:00	12:00	3	Dry, overcast, showers intermittent from 10:00 – 12:00, temp 5C, wind direction NW, F1, visibility moderate
4	21/01/2021	AC	12:25	15:25	3	Cloud cover 8/8 – 7/8, intermittent sunshine, hail showers, temp 4C, wind direction NW, F2-3, visibility good
5	27/01/2021	LOD	12:25	15:25	3	Dry, overcast, heavy showers from 13:00 and hail at the end, temp 5C, wind direction NW, F2, visibility moderate
5	21/01/2021	AC	08:55	11:55	3	Cloud cover 8/8- 7/8, intermittent hazy sunshine, short showers, temp 3-4C, wind direction NW, F2-3, visibility good
6	20/01/2021	PC	09:00	12:00	3	Dry, cloudy, some snow and sleet showers from 11:00, temp 0C, wind direction SW, F2, visibility good
6	21/01/2021	PC	12:00	15:00	3	Dry, cloudy, intermittent sunny spells, temp 3C, wind direction NW, F2, visibility good
7	25/01/2021	AC	09:00	12:00	3	Cloud cover 6/8 – 8/8, intermittent hazy sunshine, snow on the ground and sleet showers, temp 1-2C, wind direction S, F1-2, visibility good
7	25/01/2021	PC	12:30	15:30	3	Mostly dry, cloudy with intermittent showers, temp 4C, wind direction SW, F2, visibility good

Winter February 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	19/02/2021	AC	09:00	12:00	3	Cloud cover 8/8, mist and rain to 11:00, temp 9C, wind direction S, F5-6, visibility moderate to good from 11:00
1	24/02/2021	AC	12:30	15:30	3	Cloud cover 8/8, intermittent hazy sunshine and rain showers, temp 9C, wind direction SW, F4-5, visibility good
2	15/02/2021	PC	09:00	12:00	3	A dry cloudy day with intermittent rain showers, temp 6C, wind direction SW, F3, visibility good
2	19/02/2021	SC	12:30	15:30	3	Cloud cover 7/8 - 8/8, hazy sunshine, temp 9-8C, wind direction S, F5-7, visibility good
3	19/02/2021	PC	12:30	15:30	3	Dry sunny, temp 9C, wind direction SW, F5-7, visibility good
3	24/02/2021	AC	09:00	12:00	3	Cloud cover 8/8, intermittent hazy sunshine and rain showers, temp 8-9C, wind direction SW, F4-5, gusts F6, visibility moderate - good
4	15/02/2021	AC	09:00	12:00	3	Cloud cover 8/8, intermittent sunshine and rain showers, temp 7-9C, wind direction S, F4-5, visibility good
4	15/02/2021	LOD	12:30	15:30	3	Overcast, light showers, temp 9C, wind direction SSE, F3, visibility good
5	15/02/2021	LOD	09:00	12:00	3	Overcast, temp 9C, wind direction SSE, F5, visibility good
5	15/02/2021	AC	12:30	15:30	3	Cloud cover 8/8 - 7/8, intermittent hazy sunshine, temp 10-11C, wind direction SSW, F4-5, visibility good
6	15/02/2021	PC	12:30	15:30	3	Dry and cloudy, temp 9C, wind direction SW, F3-4, visibility good

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
6	24/02/2021	LOD	09:00	12:00	3	Bright, occasional showers, gusty, temp 9C, wind direction SW, F6, visibility good
7	19/02/2021	LOD	12:30	15:30	3	Dry and overcast, temp 10C, wind direction SSW, F6, visibility good
7	24/02/2021	PC	09:00	12:00	3	Cloud cover 8/8, dry dull day, temp 9C, wind direction SW, F5-6, visibility good

Winter March 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	22/03/2021	AC	08:45	11:45	3	Cloud cover 8/8, temp 8-10C, wind direction S, F4-5, visibility good
1	24/03/2021	PC	12:00	15:00	3	Dull, cloudy and consistent light rain, temp 10C, wind direction SW, F3-4, visibility poor
2	22/03/2021	AC	12:15	15:15	3	Cloud cover 8/8, rain showers and mist, temp 10-9C, wind direction SSW, F4-5 gusts F6, visibility moderate during showers to good
2	24/03/2021	PC	08:30	11:30	3	Cloud cover 6/8, dry, sunny, temp 7C, wind direction SSW, F3-4, visibility good
3	22/03/2021	PC	08:30	11:30	3	Cloud cover 8/8, dry, dull, temp 7C, wind direction SW, F2-3, visibility moderate
3	31/03/2021	PC	12:00	15:00	3	Cloud cover 8/8, dry, dull, intermittent rain, temp 7C, wind direction NNE, F2-3, visibility moderate
4	24/03/2021	AC	08:30	11:30	3	Cloud cover 6/8- 8/8, intermittent sunshine temp 7-8C, wind direction SSW, F4-5 and F5-6 from 10:30 Hrs, visibility moderate to good
4	29/03/2021	AC	12:00	15:00	3	Cloud cover 8/8, continuous rain and mist, temp 12C, wind direction SSW, F5-6 gusts 7, visibility poor
5	24/03/2021	AC	12:00	15:00	3	Cloud cover 8/8, rain showers, intermittent sunshine, temp 8-9C, wind direction SSW, F5-6, SW from 13:15 and west from 14:40, visibility good to moderate
5	29/03/2021	AC	08:30	11:30	3	Cloud cover 8/8, continuous rain and mist, temp 11- 12C, wind direction SSW, F5-6, visibility poor
6	22/03/2021	PC	12:00	15:00	3	Cloud cover 7/8, dry, dull, temp 11C, wind direction SW, F3-5, visibility very poor
6	29/03/2021	PC	08:30	11:30	3	Cloudy, consistent rain, mist and fog, temp 12C, wind direction SW, F4-6, visibility very poor
7	29/03/2021	PC	12:00	15:00	3	Cloudy, consistent rain, mist and fog, temp 12C, wind direction SW, F4-6, visibility poor
7	31/03/2021	PC	08:30	11:30	3	Cloud cover 8/8, rain and mist, temp 6-7C, wind direction N and NNE from 10:00, F3-4, visibility poor

Breeding 2021

Breeding April 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	23/04/2021	PC	06.15	09.15	3	Dry, sunny and cloudy with south-westerly winds, wind F2-4, temp 20C, and visibility good.
1	23/04/2021	AC	15.00	18.00	3	Cloud cover 8/8 with continuous hazy sunshine, wind direction southeast, wind F3-5, temp 15C-14C, and visibility good.
2	23/04/2021	PC	14.45	17.45	3	Dry, sunny and cloudy, wind direction southeast, wind F2-4, temp 16C, and visibility good.
2	23/04/2021	AC	18.30	21.30	3	Cloud cover 8/8 with continuous hazy sunshine, wind direction southeast, wind F3-5, temp 14-11C, and visibility good.
3	21/04/2021	PC	06.15	09.15	3	Bright and sunny with 40% cloud cover, wind direction south-southeast, wind F2-3, temp 14C, and visibility good.
3	21/04/2021	PC	14.45	17.45	3	80% cloud cover, dry with some sunny spells, wind direction northeast, wind F3-5, temp 9C, and visibility good.
4	21/04/2021	AC	14.50	17.50	3	Cloud cover 8/8 to 7/8 with intermittent hazy sunshine, wind direction east, wind F4-5, changed from 16.00 to east-southeast, temp 12-14C, and visibility good.
4	26/04/2021	AC	18.30	21.30	3	Cloud cover 8/8 with continuous rain and mist from 19.30, wind direction northwest, wind F3-5, temp 12-7C, and visibility good but poor from 19.30.
5	21/04/2021	AC	18.20	19.20	3	Cloud cover 7/8 to 2/8, sunshine with east-south-easterly winds, wind F4-5 and F2-3 from 19.30, temp 14-10C, and visibility good.
5	26/04/2021	AC	15.00	18.00	3	At 16.30, Cloud cover 2/8 to 8/8 with continuous sunshine from 16.30, wind direction west, wind F4-5, temp 15-12C, and visibility good.
6	21/04/2021	PC	14.45	17.45	3	Cloudy and sunny with southeast winds, wind F2-4, temp 11C, and visibility good.
6	26/04/2021	PC	18.30	21.30	3	Dull with 100% cloud cover from 19.30 to 21.00pm, dry and sunny until 19.30pm, wind direction northwest, and wind F3-5, temp 13C, and visibility good.
7	26/04/2021	PC	15.00	18.00	3	Dry and sunny with northwest winds, wind F2-4, temp 16C, and visibility
7	27/04/2021	AC	18.00	21.00	3	Cloud cover 8/8 to 6/8 with intermittent sunshine, temp 8-7C, and visibility good.

Breeding May 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	26/05/2021	AC	07.00	10.00	3	Cloud cover 7/8 to 8/8 with light rain showers and intermittent sunshine, wind direction north, wind F2-3, temp 7-10C, and visibility good.
1	28/05/2021	AC	10.20	13.20	3	Cloud cover 7/8 with intermittent sunshine, wind direction northwest, wind F2-3, temp 11-13C, and visibility good.
2	26/05/2021	AC	10.30	13.30	3	Cloud cover 8/8 with intermittent hazy sunshine, wind direction northeast, wind F2-4, temp 10-11C, and visibility good.
2	28/05/2021	AC	06.50	09.50	3	Cloud cover 2/8 to 4/8, sunshine with westerly winds, wind F1-2 and from 09.00 wind direction northwest, wind F1-2, temp 6-10C, and visibility good.
3	26/05/2021	PC	6.45	9.45	3	Dry and dull with 70% cloud cover, wind direction north-northeast, wind F1, temp 6C, and visibility good.
3	28/05/2021	PC	10.15	1.15	3	Dry, sunny and cloudy, wind direction northwest, wind F1-2, temp 13C, and visibility good.
4	24/05/2021	PC	7.00	10.00	3	Dry and sunny with 50% cloud cover, wind direction northwest, wind F1-2, temp 6C, and visibility good.
4	24/05/2021	AC	10.30	13.30	3	Cloud cover 6/8 to 8/8 with rain showers and intermittent sunshine, wind direction northwest, wind F3-5, from 11.15, wind direction west, wind F3-5, temp 10-9C, and visibility good.
5	24/05/2021	AC	07.00	10.00	3	Cloud cover 4/8 to 6/8 with sunshine and rain showers, wind direction northwest, wind F3-5, temp 7-9C, and visibility good.
5	24/05/2021	PC	10.30	1.30	3	Dry and sunny with 50% cloud cover, spells of rain at 10.37 to 12.00, wind direction northwest, wind F3-5, temp 11C, and visibility good.
6	21/05/2021	PC	6.15	9.15	3	Wet, windy and dull with 100% cloud cover, wind direction west, wind F5-6, temp 8C, and visibility ok.
6	26/05/2021	PC	10.15	1.15	3	Dry and dull with 70% cloud cover, wind direction north, wind F1-2, temp 11C, and visibility good.
7	21/05/2021	PC	9.45	12.45	3	Wet, windy and dull with 100% cloud cover, wind direction north, wind F4-5, temp 9C, and visibility poor.
7	28/05/2021	PC	6.45	9.45	3	Dry and sunny with north-westerly winds, wind F1, temp 5C, and visibility good.

Breeding June 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	16/06/2021	AC	16.10	19.10	3	Cloud cover 8/8 with intermittent sunshine, wind direction southwest, wind F4-5, temp 12-11C, and visibility good.
1	18/06/2021	PC	08.00	11.00	3	Dull, dry and cloudy with slack northerly winds, wind F1, temp 11C, and visibility good.
2	10/06/2021	PC	16.00	19.00	3	Sunny and windy with 100% cloud cover from 17.00 to 19.00, wind direction southwest, wind F4-6, temp 15C, and visibility good.
2	16/06/2021	AC	19.40	22.40	3	Cloud cover 8/8 with intermittent sunshine and rain showers, wind direction southwest, wind F3-4, temp 11-9C, and visibility good.
3	14/06/2021	PC	19.30	22.30	3	Dry with 90% cloud cover, wind direction west, wind F1-2, temp 12C, and visibility good.
3	16/06/2021	PC	16.00	19.00	3	90% cloud cover with sporadic showers, rain and windy, wind direction southwest, wind F3-5, temp 12C, and visibility ok.
4	10/06/2021	AC	16.00	19.00	3	Cloud cover 6/8 to 8/8 with sunshine from 17.00, wind direction southwest, wind F5-6, temp 16-13C, and visibility good.
4	14/06/2021	AC	19.30	22.30	3	Cloud cover 8/8 to 6/8 with intermittent sunshine, wind direction west, wind F3-4, temp 11-9C, and visibility good.
5	10/06/2021	AC	19.30	22.30	3	Cloud cover 8/8 with continuous rain, wind direction west, wind F5-7, temp 13-11C, and visibility poor.
5	14/06/2021	AC	16.00	19.00	3	Cloud cover 8/8 with intermittent sunshine, wind direction west, wind F4-5, temp 12-10C, and visibility good.
6	16/06/2021	PC	19.30	22.30	3	Windy with 80% cloud cover, wind direction southwest, wind F4-5, temp 17C, and visibility good.
6	18/06/2021	PC	16.30	19.30	3	Dull, dry and cloudy with slack northerly winds, wind F1-2, temp 10C, and visibility good.
7	10/06/2021	PC	19.30	22.30	3	100% cloud cover, wet, misty and dull with heavy rain, wind direction southwest, wind F4-5, temp 13C, and visibility very poor.
7	14/06/2021	PC	16.00	19.00	3	Dull and dry with 100% cloud cover, wind direction west, wind F2-3, temp 12C, and visibility ok.

Breeding July 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	15/07/2021	AC	07.15	10.15	3	Cloud cover 8/8 with continuous mist and fog, wind direction west-southwest, wind F1-2, temp 13-15C, and visibility poor.
1	19/07/2021	AC	10.30	13.30	3	Cloud cover 8/8 to 11.00, sunshine from 11.00 with northeast winds, wind F1-2, from 12.00 wind F2-3, temp 15-18C, and visibility good.
2	15/07/2021	AC	10.45	13.45	3	Cloud cover 8/8 with west-southwest winds, wind F2-3, temp 16C, and visibility good.
2	19/07/2021	AC	07.00	10.00	3	Cloud cover 8/8 with dense fog from 09.00 to 10.00, wind direction northeast, wind F1-2, temp 12-15C, and visibility poor to moderate from 09.00.
3	15/07/2021	PC	10.45	1.45	3	Dry and dull with 100% cloud cover, wind direction west, wind F1-2, temp 15C, and visibility good.
3	19/07/2021	PC	07.10	10.10	3	Foggy and dull with north-easterly winds, wind F1-2, temp 15C, and visibility poor.
4	21/07/2021	AC	07.00	10.00	3	Cloud cover 2/8 with continuous sunshine, wind direction southeast, wind F1-2, temp 16-22C, and visibility good.
4	23/07/2021	AC	10.30	13.30	3	Cloud cover 2/8 with continuous hazy sunshine, temp 22-26C, and visibility good.
5	21/07/2021	AC	10.30	13.30	3	Cloud cover 2/8 to 3/8 with continuous sunshine, wind direction southeast, wind F2-3, temp 22-26C, and visibility good.
5	23/07/2021	AC	07.00	10.00	3	Cloud cover 3/8 with continuous hazy sunshine, wind direction southeast, wind F1-2, temp 17-21C, and visibility good.
6	21/07/2021	PC	6.45	9.45	3	Dry and sunny with 60% cloud cover, wind direction southeast, wind F1-2, temp 17C, and visibility good.
6	23/07/2021	PC	10.00	13.00	3	Dry and sunny with south-easterly winds, wind F1-2, temp 23C, and visibility good.
7	19/07/2021	PC	10.40	1.40	3	Dull and overcast with north-easterly winds, wind F1-2, temp 18C, and visibility ok.
7	23/07/2021	PC	6.00	9.00	3	Dry and sunny with south-easterly winds, wind F1-2, temp 18C, and visibility good.

Breeding August 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	23/08/2021	AC	16.15	19.15	3	Cloud cover 7/8 with intermittent sunshine, wind direction northeast, wind F2-3, temp 19-18C, and visibility good.
1	26/08/2021	AC	12.30	15.30	3	Cloud cover 0/8 with continuous sunshine, wind direction south-southeast, wind F2-4, temp 17-21C, and visibility good.
2	11/08/2021	PC	11.30	14.30	3	Dry and sunny with 40% cloud cover, wind direction southwest, wind F3-5, temp 15C, and visibility good.
2	18/08/2021	PC	14.00	17.00	3	Overcast and dull with consistent light rain, wind direction west, wind F2-3, temp 15C, and visibility ok.
3	23/08/2021	AC	12.45	15.45	3	Cloud cover 8/8 to 7/8 with intermittent sunshine, wind direction southeast, wind F2-3, from 15.00 wind direction east, wind F2-3, temp 18-19C, and visibility good.
3	26/08/2021	AC	16.00	19.00	3	Cloud cover 0/8 with continuous sunshine, wind direction north-northeast, wind F2-3, temp 20-16C, and visibility good.
4	16/08/2021	AC	12.20	15.20	3	Cloud cover 8/8 with light rain showers, wind direction west-northwest, wind F4-5, from 14.15 wind direction west, wind F4-5, temp 13-14C, and visibility good.
4	19/08/2021	AC	15.30	18.30	3	Cloud cover 8/8 with light rain showers, wind direction east-southeast, wind F2-3, temp 17-15C, and visibility good.
5	16/08/2021	AC	15.50	18.50	3	Cloud cover 8/8 with continuous light rain, wind direction west, wind F4-5, temp 14-12C, and visibility moderate.
5	19/08/2021	AC	12.00	15.00	3	Cloud cover 8/8 with intermittent hazy sunshine, wind direction east, wind F2-3, temp 15-17C, and visibility good.
6	11/08/2021	PC	15.00	18.00	3	Dry and sunny with 40% cloud cover, wind direction southwest, wind F3-5, temp 16C, and visibility good.
6	16/08/2021	PC	12.00	15.00	3	Overcast and dull with misty light rain, wind direction southwest, wind F4-5, temp 13C, and visibility ok.
7	16/08/2021	PC	15.30	18.30	3	Overcast, dull and misty with light rain, wind direction southwest, wind F4, temp 18C, and visibility ok.
7	30/08/2021	PC	09.00	12.00	3	Dry, overcast and dull with north-easterly winds, wind F1, temp 14C, and visibility good.

Breeding September 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	15/09/2021	SC	13.00	16.00	3	Cloud cover 8/8 to 7/8, mostly overcast with some sunny spells and showers, wind direction north-northwest to west-northwest, temp 15-16C, and visibility good.
1	21/09/2021	PC	08.15	11.15	3	Dry, sunny and cloudy with south-westerly winds, wind F3-5, temp 13C, and visibility good.
2	13/09/2021	SC	14.40	17.40	3	Low cloud with mist, rain and fog but cleared at 16.50, cloud cover 8/9, wind direction south-southeast to southeast, wind F1-3, temp 15-16C, and visibility poor to moderate.
2	15/09/2021	SC	16.30	19.30	3	Mostly cloudy with some sunshine to mostly sunny, cloud cover 7/8 to 4/8, wind direction west to west-southwest, wind F2-3, temp 14-12C, and visibility good.
3	14/09/2021	SC	09.35	12.35	3	Cloud cover 8/8 with low cloud and fog from 11.50, heavy rain and dense fog, wind direction east-southeast to east, wind F0-1, temp 15-18C, and visibility poor to moderate to very poor.
3	14/09/2021	SC	13.05	15.05	3	Persistent mist, rain and low cloud, cloud cover 8/8, wind direction north-northeast to north, wind F0-1, temp 16C, and visibility poor.
4	17/09/2021	PC	11.45	14.45	3	70% cloud cover but dry and sunny with westerly winds, wind F1-2, temp 16C, and visibility good.
4	20/09/2021	PC	08.00	11.00	3	100% cloud cover, dull with mist and fog, wind direction southwest, wind F1-2, temp 13C, and visibility poor.
5	17/09/2021	PC	08.15	11.15	3	Dry, dull and overcast with mist, wind direction west, wind F1-3, temp 13C, and visibility ok.
5	20/09/2021	PC	11.30	14.30	3	Dry, Dull and overcast with south-westerly winds, wind F2-3, temp 15C, and visibility good.
6	15/09/2021	SC	09.20	12.20	3	Cloud cover 8/8, overcast with patches of mist and fog, wind direction north, wind F0-1, temp 14-15C, and visibility good to poor.
6	23/09/2021	PC	11.45	14.45	3	Dry and dull with 100% cloud cover, wind direction west, wind F2-3, temp 13C, and visibility good.
7	21/09/2021	PC	11.45	14.45	3	Dry, dull and overcast with mist and rain after 12.30, wind direction southwest, wind F3-5, temp 18C, and visibility good to poor.
7	23/09/2021	PC	08.15	11.15	3	Dry and dull with 100% cloud cover, wind direction west, wind F2-3, temp 12C, and visibility ok.

Winter 2021/22Wintering October 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	14/10/2021	PC	15.30	18.30	3	A dull overcast day with light rain and mist. Winds South-westerly F2-3, Temp 13C and visibility moderate.
1	15/10/2021	PC	07.30	10.30	3	A dry, cloudy day with some sunshine, fog, and South/South-easterly winds F1. Temp 3C with good visibility.
2	15/10/2021	PC	11.00	14.00	3	A dry, sunny day with a South-easterly breeze F1. Temp 13C with very good visibility.
2	26/10/2021	PC	08.30	11.30	3	A dull, windy, overcast day with consistent showers and a South-westerly wind F4-6. Temp 13C with poor visibility.
3	11/10/2021	SC	15.30	18.30	3	A mostly sunny day with cloud cover 5/8 and West/South-west to Westerly winds F1-3. Temp 14-12C with good visibility.
3	14/10/2021	SC	09.30	12.30	3	An overcast, cloudy day with full cloud cover and South-westerly winds F4-6. Temp 14-15C with good visibility.
4	12/10/2021	SC	11.15	14.15	3	A very cloudy overcast day with Westerly winds F1-3. Temp 12C with good visibility.
4	13/10/2021	SC	13.15	16.15	3	An overcast but bright day with cloud cover 7/8 to 8/8 and the occasional sunny spell. Winds Southerly F2-3, Temp 13-14C with good visibility.
5	12/10/2021	SC	14.45	17.45	3	A very cloudy overcast evening with Westerly winds F1-3. Temp 13C with good visibility.
5	13/10/2021	SC	09.45	12.45	3	An overcast but bright morning with South to South/South-westerly winds F0-1. Temp 11-14C with good visibility.
6	14/10/2021	SC	13.00	16.00	3	An overcast, cloudy day with strong winds, continuous light rain, and patches of fog. Winds West/South-westerly F4-6, Temp 14C with good to poor visibility.
6	26/10/2021	PC	12.00	15.00	3	A dull, windy, overcast day with consistent rain and South-westerly winds F5-7. Temp 16C with poor visibility.
7	15/10/2021	SC	10.30	13.30	3	A sunny day with blue skies, light cloud cover and East/South-easterly winds F2-3. Temp 10-11C with very good visibility.
7	14/10/2021	PC	12.00	15.00	3	A mostly dull, dry overcast day with some light rain, mist and South-westerly winds F3-5. Temp 14C with good visibility.

Winter November 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	09/11/2021	SC	11.00	14.00	3	A mostly cloudy start to the day with intermittent sunshine and cloud later and South-westerly winds F4-5. Temp 12-14C with good visibility.
1	16/11/2021	SC	12.40	15.40	3	A mostly cloudy day with occasional sunny spells and showers. Cloud cover 7/8 to 8/8 with West to West/North-west winds F4-6.
2	11/11/2021	SC	14.30	17.30	3	A very cloudy day with heavy driving rain and low fog. Strong South/South-westerly winds F4-8, temp 13C with poor visibility.
2	15/11/2021	PC	10.45	13.45	3	A dry, sunny day with 60% cloud cover and South-westerly winds F1-2.
3	11/11/2021	PC	11.00	14.00	3	An overcast day with low cloud, rain, and fog. This cleared at 12.00 giving some sunshine but turned to heavy, driving rain from 13.30. Winds South/South-easterly F4-8, temp 12-13C with poor to good visibility.
3	15/11/2021	PC	14.15	17.15	3	A dry, dull day with 80% cloud cover and South-westerly winds F1-2. Temp 12C with good visibility.
4	15/11/2021	PC	07.40	10.40	3	A dry, sunny day with 60% cloud cover and South-westerly winds F1-2. Temp 4C with good visibility.
4	11/11/2021	PC	11.15	14.15	3	A dull day with thick fog, consistent light rain and moderate South-easterly winds F3-4. Temp 12C with very poor visibility.
5	09/11/2021	PC	11.10	14.10	3	A dry sunny day with 60% cloud cover and South-westerly winds F2-3. Temp 10C with good visibility.
5	11/11/2021	PC	07.45	10.45	3	A dull, cloudy day with fog, mist, and sporadic light rain. Winds South-easterly F2-4, temp 7C with poor visibility.
6	16/11/2021	SC	09.00	12.00	3	An overcast day with very heavy rain and strong, south-westerly winds F7. Temp 11C with poor to very good visibility.
6	09/11/2021	SC	14.30	17.30	3	A cloudy, overcast evening with strong South-westerly winds F6. Temp 11C with good visibility.
7	17/11/2021	SC	12.50	15.50	3	A cloudy, overcast day with some light rain and strong West/South-westerly winds F4-6. Temp 11-10C with good visibility.
7	17/11/2021	PC	08.11	11.00	3	A very cloudy dull day with sporadic light rain and South-westerly winds F4-5. Temp 9C with good visibility.

Winter December 2021

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	09/12/2021	SC	09.30	12.30	3	A dense cloudy day with mist, fog, and continuous rain, clearing at 11.20. Winds Westerly F4-6, temp 9C with poor to good visibility.
1	13/12/2021	PC	13.15	16.15	3	A dry, sunny day with some cloud cover and Westerly winds F1. Temp 5C with good visibility.
2	13/12/2021	SN	09.45	12.45	3	A dry, bright sunny day with light cloud and a South-westerly breeze F1. Temp 6C with good visibility.
2	13/12/2021	SN	13.15	16.15	3	A dry, bright sunny day with light cloud and a South-westerly breeze F1. Temp 5C with good visibility.
3	10/12/2021	SC	13.30	16.30	3	A lightly cloudy day with intermittent sunshine, some showers, and West/North-westerly winds F5-6. Temp 4-5C with good visibility.
3	09/12/2021	PC	8.20	11.20	3	A dull, cloudy day with heavy fog and Southerly winds F3-4. Temp 9C with poor visibility.
4	13/12/2021	SC	13.30	16.30	3	A sunny day with light cloud and West/South-westerly winds F2-4. Temp 8-5C with good visibility.
4	14/12/2021	SC	09.45	12.45	3	An overcast day with heavy cloud, some rain, and very strong South/South-westerly winds F4-7. Temp 10C with good visibility.
5	08/12/2021	PC	08.10	11.10	3	A dry, dull overcast day with very strong North-westerly winds F8-10. Temp 4C with poor visibility.
5	08/12/2021	PC	11.40	14.40	3	A dull overcast day with occasional light showers and very strong North-westerly winds F9-10. Temp 7C with good visibility.
6	09/12/2021	SC	13.00	16.00	3	A dense cloudy day with mist, fog, and continuous rain. Winds West to West/North-westerly F7, temp 8-7C with poor to moderate visibility.
6	10/12/2021	SC	10.00	13.00	3	Intermittent sunshine and light to heavy cloud with heavy prolonged hail and sleet showers and West/North-westerly winds F7. Temp 4C with good to poor visibility.
7	09/12/2021	PC	11.50	14.50	3	A dull day with heavy cloud, 8/8, and some heavy to light rain. Winds Westerly F3-5, temp 6C and visibility moderate.
7	10/12/2021	PC	09.45	12.45	3	A dry, sunny day with 4/8 cloud cover and Westerly winds F1-2. Temp 2C with good visibility.

Winter January 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	14/01/2022	LO'D	09.30	12.30	3	Dry day. Winds southerly F1. Temp 5C with poor visibility.
1	14/01/2022	LO'D	12.30	15.30	3	Dry day. Winds southerly F1. Temp 5C with poor visibility.
2	17/01/2022	LO'D	11.00	14.00	3	Clear and bright until last half an hour following this there was thick fog. Cloud cover 2/8. Dry turning misty. Winds southerly F1. Temp 5C with good to poor visibility.
2	17/01/2022	LO'D	14.00	17.00	3	Still day. Thick mist throughout survey. Winds southerly F1. Temp 2C with poor visibility.
3	07/01/2022	SC	08.45	11.45	3	An overcast cold day with snow on the ground. Pronged heavy showers of sleet and snow. Cloud cover 8/8 to 5/8. West/west, north-westerly winds F2-4. Temp 2-3C with good to poor visibility.
3	07/01/2022	SC	12.30	15.30	3	Sunshine, cold day with snow on the ground. Cloud cover 6/8 to 5/8. West, north-westerly to west winds F2-4. Temp 3C with good to poor visibility.
4	11/01/2022	SC	08.45	11.45	3	Intermittent sunshine and cloud. Cloud cover 6/8 – 4/8. South-westerly winds F3-4. Temp 6-8C with good visibility.
4	13/01/2022	SC	14.30	17.30	3	An overcast day with low cloud, light misty rain. Cloud cover 8/8. South/South-westerly winds F2-4. Temp 8C with moderate to poor visibility.
5	11/01/2022	SC	14.25	17.25	3	Mostly sunny day. Cloud cover 4/8. South-westerly winds F4-5. Temp 8-7C with good visibility.
5	13/01/2022	SC	09.00	12.00	3	Overcast with some light rain until 11.40. Following this it became very cloudy with reduced visibility. Cloud cover 8/8. South winds F2-4. Temp 7C with good to poor visibility.
6	11/01/2022	PC	08.20	11.20	3	A dry and dull day. Cloud cover 8/8. Winds south-westerly F2-3. Temp 2C and visibility good.
6	14/01/2022	PC	11.45	14.45	3	A dry and dull and cloudy day. Winds southerly F1-2. Temp 5C and visibility good.
7	14/01/2022	PC	08.15	11.15	3	A dry, dull and cloudy day. Winds southerly F1-2. Temp 4C and visibility good.
7	11/01/2022	PC	11.50	14.50	3	A dry, dull and cloudy day. Winds south-westerly F2-3. Temp 6C and visibility good.

Winter February 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	01/02/2022	SC	09.00	12.00	3	A dense cloudy day with strong winds and some rain. Cloud cover 8/8. Winds Westerly F4-7. Temp 9-10C with very poor visibility.
1	07/02/2022	SC	15.10	18.10	3	An overcast day with continuous misty rain and strong winds. Cloud cover 8/8. South-westerly winds F5-8. Temp 11C with poor visibility.
2	08/02/2022	SC	11.30	16.30	3	An overcast windy day. Cloud cover 8/8. West south-westerly wind F4-5. Temp 8C with good visibility.
2	01/02/2022	SC	12.30	15.30	3	Dense fog with heavy persistent rain and strong winds. Cloud cover 8/8. Westerly wind F4-7. Temp 11C with poor to very poor visibility.
3	14/02/2022	PC	12.00	15.00	3	Constant light rain (0.2 mm). Cloud cover 7/8. North-westerly winds F3-5. Temp 6C with good visibility.
3	14/02/2022	PC	15.30	18.30	3	Bright and sunny with some light rain (0.1 mm). Cloud cover 5/8. Westerly winds F3-5. Temp 8C with good visibility. Dusk watch
4	16/02/2022	PC	10.00	13.00	3	A bright, very windy day with some light rain (0.3 mm). Cloud cover 2/8. South-westerly winds F10-11. Temp 11C with good visibility.
4	16/02/2022	PC	13.30	16.30	3	Very windy with some light rain (0.2 mm). Cloud cover 3/8. South-westerly winds F10-11. Temp 10C with good visibility.
5	08/02/2022	PC	07.30	10.30	3	Some light rain (0.1 mm). Cloud cover 7/8. South-westerly winds F4-5. Temp 6C with good visibility.
5	08/02/2022	PC	11.00	14.00	3	Some light rain (0.1 mm). Cloud cover 7/8. South-westerly winds F4-5. Temp 6C with good to moderate visibility.
6	10/02/2022	SC	09.00	12.00	3	Intermittent sunshine and cloud with heavy wintery squalls. Snow on the ground. Cloud cover 4/8. North westerly winds F4-6. Temp 6C with good to moderate visibility.
6	07/02/2022	SC	11.30	14.30	3	Overcast, dull, hazy day with strong winds. Cloud cover 8/8. South-westerly winds F5-8. Temp 6C with moderate visibility.
7	10/02/2022	SC	12.30	15.30	3	Mostly sunny with heavy wintery squalls. Cloud cover 6/8 – 3/8. North-westerly winds F4-7. Temp 3C and good visibility.
7	08/02/2022	SC	15.10	18.10	3	Overcast but bright with strong winds. Cloud cover 8/8. West to south-westerly winds F5-7. Temp 7C and good visibility.

Winter March 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	02/03/2022	SC	13.45	16.45	3	An overcast damp day with fog and mist. Cloud cover 8/8. South-easterly winds F3-5. Temp 7C with poor visibility.
1	03/03/2022	SC	11.15	14.15	3	An overcast day with some heavy showers. Later intermittent sunshine and clouds. Cloud cover 8/8 – 5/8. South-westerly winds F3-5. Temp 7C with moderate visibility.
2	01/03/2022	SC	12.30	15.30	3	A lovely sunny day. Cloud cover 3/8. East south-easterly wind F2-3. Temp 8C with good visibility.
2	09/03/2022	SC	06.45	09.45	3	An overcast wet and rainy morning. Cloud cover 8/8. West north-westerly wind F3-5. Temp 5-6C with moderate to good visibility.
3	01/03/2022	SC	16.00	19.00	3	A mostly sunny but cool evening. Cloud cover 3/8. East south-easterly wind F2-4. Temp 7-4C with good visibility.
3	10/03/2022	SC	06.45	09.45	3	A bright, cold frosty morning. Cloud cover 3/8 to 7/8. South south-easterly winds F2-5. Temp 0-2C with good visibility.
4	03/03/2022	SC	06.45	09.45	3	A bright, cool, calm morning with light rain from 09.24. Cloud cover 4/8. West south-westerly winds F2-3. Temp 4-7C with good visibility.
4	11/03/2022	SC	11.30	14.30	3	A damp afternoon with persistent light rain getting heavier at 13.00. Cloud cover 8/8. South south-westerly winds F3-4. Temp 8C with moderate visibility.
5	09/03/2022	SC	10.30	13.30	3	A mostly cloudy morning with occasional sunny spells. Cloud cover 8/8 to 7/8. West north-westerly winds F3-5. Temp 5C with good visibility.
5	10/03/2022	SC	14.30	17.30	3	An overcast day with strong winds. Cloud cover 5/7. South south-easterly winds F5-7. Temp 8-9C with good visibility.
6	02/03/2022	SC	10.15	13.15	3	A damp breezy day with dense fog. Cloud cover 8/8. South-easterly winds F3-6. Temp 6C with very poor visibility.
6	11/03/2022	SC	06.40	09.40	3	An overcast day with continuous heavy rain and dense fog. South south-westerly winds F6-7. Temp 5-6C with very poor visibility.
7	23/03/2022	PC	12.50	15.50	3	A dry, sunny and windy day. Cloud cover 2/8. South/South-easterly winds F3-4. Temp 16C with good visibility.
7	28/03/2022	PC	10.30	12.30	3	A dry and sunny day. Cloud cover 1/8. South-westerly winds F1. Temp 16C with good visibility.

Breeding Survey 2022

Breeding April 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	11/04/2022	SC	13.00	16.00	3	Overcast. South westerly winds F2-5. Cloud cover 8/8. Temp 12C with good visibility.
1	05/04/2022	SC	16.25	19.25	3	Overcast with strong winds. Westerly winds F5-7. Cloud cover 8/8.
2	05/04/2022	SC	12.55	15.55	3	Dense mist, heavy rain with strong winds. South westerly winds F5-8. Cloud cover 8/8. Temp 9-11C with poor visibility.
2	11/04/2022	SC	16.30	19.30	3	An overcast evening with some rain. South westerly winds F4-5. Cloud cover 8/8. Temp 12-11C with good visibility.
3	01/04/22	SC	12.00	15.00	3	Sunshine but cold. Cloud cover 4/8. North westerly wind F 3-4. Temp 8C with good visibility.
3	07/04/2022	SC	15.30	18.30	3	Sunshine. North north-westerly winds F4. Cloud cover 6/8. Temp 8C with good visibility.
4	06/04/2022	SC	13.00	16.00	3	Cloud cover 8/8 to 6/8. Winds west southwest F6-9. Temp 7C with moderate visibility.
4	04/04/2022	SC	17.30	20.30	3	Fog/mist clearing at times. Cloud cover 8/8. Winds westerly F6-7. Temp 10-9C with poor visibility
5	04/04/2022	SC	14.00	17.00	3	Continuous mist/rain with moderate winds. Cloud cover 8/8. Winds westerly F4-6. Temp 10C with poor visibility.
5	06/04/2022	SC	16.30	19.30	3	Prolonged heavy squalls with very strong winds. Winds west south-westerly F7-9. Temp 7-6C with poor visibility.
6	07/04/2022	SC	12.00	15.00	3	Fog, rain, sleet, snow that eventually cleared and it became bright. North winds F4. Cloud cover 8/8. Temp 2-4C with very poor to good visibility.
6	01/04/2022	SC	15.30	18.30	3	Intermittent sunshine and cloud. Cloud cover 7/8. North westerly winds F3-4. Temp 8-7C with good visibility.
7	14/04/2022	SC	11.00	14.00	3	A damp afternoon with low cloud/mist to start clearing to a hazy dry afternoon. South south-easterly winds F3-5. Cloud cover 8/8. Temp 10-12C with moderate to good visibility.
7	13/04/2022	SC	14.00	17.00	3	A warm sunny afternoon with intermittent sunshine and cloud. Cloud cover 4/8 to 7/8. West south-westerly winds F2-3. Temp 14-15C with good visibility.

Breeding May 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	10/05/2022	SC	10.30	13.30	3	Intermittent sunshine and cloud with heavy prolonged rain showers. Cloud cover 7/8 to 6/6. Winds south-westerly F5-7. Temp 11-12C with good visibility
1	11/05/2022	SC	06.30	09.30	3	Intermittent sunshine and cloud with occasional rain showers. Cloud cover 7/8 to 5/6. Winds north-westerly F4-5. Temp 8-10C with good visibility.
2	03/05/2022	SC	09.30	12.30	3	An overcast dry day. Cloud cover 8/8. West-south-westerly winds F2-3. Temp 13-14C with good visibility.
2	10/05/2022	SC	07.00	10.00	3	Intermittent sunshine and cloud to overcast with occasional showers. Cloud cover 7/8. Winds west south-westerly F4-6. Temp 10-11C with good visibility.
3	03/05/2022	SC	13.20	16.20	3	An overcast afternoon with some light rain. Cloud cover 8/8. West south-westerly winds F3-5. Temp 14-13C with good visibility.
3	13/05/2022	SC	10.00	13.00	3	An overcast dull day with strong winds, low cloud and some rain. Cloud cover 8/8. Winds westerly F5-6. Temp 13C and visibility moderate.
4	05/05/2022	SC	11.10	14.10	3	An overcast day with some showers. Cloud cover 8/8. Winds southwest F4-6. Temp 15-17C and visibility good.
4	09/05/2022	SC	13.00	16.00	3	Heavy persistent rain with mist which cleared from 15.15 to 15.50 and then it rained again. Cloud cover 8/8. South southwest wind F4-7. Temp 12C with poor visibility.
5	05/05/2022	SC	07.40	10.40	3	An overcast dry morning but later there were some light showers. Cloud cover 8/8. South southwest winds F3-5. Temp 12-14C with good visibility.
5	09/05/2022	SC	09.30	12.30	3	Continuous heavy driving rain for duration of the VP survey. Cloud cover 8/8. Winds south-south-westerly F4-7. Temp 11-12C and visibility poor.
6	11/05/2022	SC	10.10	13.10	3	Intermittent sunshine and cloud with heavy down pours of rain and sleet. Cloud cover 6/8 – 8/8. Winds west north-westerly wind F4-5. Temp 11C and good visibility.
6	13/05/2022	SC	06.30	09.30	3	An overcast dull morning with strong winds and low cloud. Cloud cover 8/8. West south-westerly winds F5-7. Temp 11C and moderate visibility.
7	23/05/2022	SC	18.00	21.00	3	An overcast evening. Cloud cover 8/8. Westerly wind F3-4. Temp 12-10C and good visibility.
7	30/05/2022	SC	12.30	15.30	3	Intermittent sunshine and cloud with some showers. North winds F3-4. Temp 12-11C and good visibility.

Breeding June 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	16/06/2022	SC	16.30	19.30	3	An overcast breezy day. Cloud cover 7/8 to 8/8. West-south-west wind F3-4. Temp 13C with good visibility.
1	15/06/2022	SC	20.00	23.00	3	An overcast clear evening. Cloud cover 8/8. South wind F2-5. Temp 14-13C with good visibility.
2	10/06/2022	PC	15.15	18.15	3	Wet and windy with 0.3 mm rain. Cloud cover 8/8. South-westerly winds F5-6. Temp 13C with good visibility.
3	10/06/2022	PC	18.45	21.45	3	Very windy with 0.2 mm of rain. Cloud cover 8/8. South-westerly winds F5-7. Temp 13C with moderate visibility.
4	07/06/2022	SC	16.30	19.30	3	An overcast, calm, warm evening with continuous light rain. Cloud cover 8/8. South-easterly winds F1-2. Temp 16C with good visibility.
4	01/06/2022	SC	19.55	22.55	3	A sunny, calm, clear evening. Cloud cover 4/8. North winds F2-0. Temp 14C with good visibility.
5	01/06/2022	SC	15.30	18.30	3	A lovely, sunny, clear day. Cloud cover 5/8. North north-easterly winds F2. Temp 15-14C with good visibility.
5	07/06/2022	SC	20.00	23.00	3	An overcast, calm evening with dense misty rain for the last hour. Cloud cover 8/8. South-easterly winds F1-2. Temp 13-12C with good visibility.
6	14/06/2022	SC	16.30	19.30	3	An overcast mild day with occasional dense misty showers Cloud cover 8/8. South-westerly winds F2-5. Temp 13-12C with good visibility.
6	13/06/2022	SC	20.00	23.00	3	An overcast breezy evening with prolonged misty showers. Cloud cover 8/8. South-westerly winds F3-5. Temp 12-10C with good visibility.
7	15/06/2022	SC	16.30	19.30	3	An overcast day with persistent heavy misty rain. Cloud cover 8/8. South-westerly winds F3-5. Temp 14-13C with moderate to poor visibility.
7	14/06/2022	SC	20.00	23.00	3	An overcast evening with some very light rain at times. Cloud cover 8/8. South winds F2-4. Temp 12-11C with good visibility.

Breeding July 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	05/07/2022	PC	11.30	14.30	3	Foggy and misty. Cloud cover 8/8. Westerly winds F1-2 Temp 12C with poor visibility.
1	07/07/2022	PC	11.00	14.00	3	Dry and sunny. Cloud 6/8. Winds F1-2 westerly. Temp 22C with good visibility.
2	05/07/2022	PC	08.00	11.00	3	Foggy and misty. Cloud cover 8/8. Westerly winds F1-2. Temp 13C with very poor visibility.
2	07/07/2022	PC	14.30	17.30	3	Sunny and dry. Cloud cover 6/8. Westerly winds F1-2. Temp 22C with good visibility.
3	06/07/2022	SC	08.00	10.00	3	Dense fog with prolonged misty showers and strong winds. Cloud cover 8/8. West south-westerly winds F4-6. Temp 15-16C with very poor visibility.
3	08/07/2022	SC	11.00	14.00	3	A lovely warm sunny day. Cloud 4/8. Westerly winds F3-4. Temp 16-17C with good visibility.
4	01/07/2022	SC	07.30	10.30	3	An overcast and bright morning. Cloud 8/8. Westerly winds F2-3. Temp 11C with good visibility.
4	05/07/2022	SC	11.00	14.00	3	Dense fog with some misty rain. Cloud cover 8/8. Westerly winds F3-4. Temp 14C with very poor to poor visibility.
5	01/07/2022	SC	11.30	14.30	3	An overcast, mild afternoon with continuous rain from 13.15 to 14.30. Cloud 8/8. South south-easterly winds F3-5. Temp 13-12C with good to moderate visibility.
5	05/07/2022	SC	14.30	17.30	3	A foggy day only clearing from 16.10 to 16.40 and dense fog rolled in again until 17.30. Cloud cover 8/8. Winds west winds F3-4. Temp 14C with good to visibility.
6	08/07/2022	SC	07.00	10.00	3	Dense fog with light misty rain. Cloud cover 8/8. West southwest winds F2-4. Temp 15-16C with very poor visibility.
6	06/07/2022	SC	08.00	11.00	3	Dense fog with prolonged misty showers and strong winds. Cloud cover 8/8. West winds F4-6. Temp 16-17C with very poor visibility.
7	20/07/2022	SC	12.00	15.00	3	Mostly cloudy but bright with occasional sunshine. Cloud cover 8/8. Northwest winds F3-4. Temp 16-15C with good visibility.
7	29/07/2022	SC	13.00	16.00	3	An overcast, dull, windy day with prolonged misty showers. Cloud cover 8/8. South southwest F3-5. Temp 18-17C with good to moderate visibility.

Breeding August 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	02/08/2022	PC	13.30	16.30	3	A dull, windy and wet (0.1 mm). Cloud cover 8/8. South westerly winds F4-5. Temp 16C with moderate visibility.
1	22/08/2022	PC	09.30	12.30	3	Mist, fog dull and dry. Cloud cover 8/8. South westerly winds F3. Temp 16C with moderated and poor after 11 am visibility.
2	22/08/2022	PC	13.00	16.00	3	Dull with light rain, mist and fog. Cloud cover 8/8. South-westerly winds F2. Temp 16C with poor visibility.
2	02/08/2022	PC	10.00	13.00	3	Dull, windy and raining (0.2 mm). Cloud cover 8/8. South-westerly winds F3-4. Temp 14C with moderate visibility.
3	05/08/2022	SC	10.45	13.45	3	Mostly cloudy with some prolonged sunny spells and the odd light shower. Cloud cover 7/8 – 6/8. North-westerly winds F3-4. Temp 14-15C with good visibility.
3	04/08/2022	SC	15.30	18.30	3	A windy warm sunny day. Cloud cover 6/8. North-westerly winds F4-5. Temp 16C with good visibility.
4	10/08/2022	SC	12.30	15.30	3	A warm sunny day. Cloud cover 1/8. South-westerly winds F2-3. Temp 22-23C with good visibility.
4	09/08/2022	SC	16.00	19.00	3	A warm sunny evening. Cloud cover 4/8. West south-westerly winds F3-4. Temp 21-19C with good visibility.
5	09/08/2022	SC	12.30	15.30	3	A warm sunny day. Cloud cover 2/8. West south-westerly winds F3. Temp 21C with good visibility.
5	10/08/2022	SC	16.00	19.00	3	A warm sunny day with blue skies. Cloud cover 1/8 – 0/8. West-south-westerly winds F2-3. Temp 25-21C with good visibility.
6	11/08/2022	PC	10.30	13.30	3	A very warm sunny day with clear blue skies. Cloud cover 0/8. West north-westerly winds F0-1. Temp 22-23C with good visibility.
6	08/08/2022	PC	15.30	18.30	3	A warm sunny windy day gradually becoming overcast. Cloud cover 5/8 – 8/8. West south-westerly winds F3-4. Temp 19-18C with good visibility.
7	18/08/2022	PC	10.20	13.20	3	An overcast day with continuous heavy dense mist/rain until 12.30. After this there was sunny spells and clear skies. Cloud cover 8/8 – 7/8. West south-westerly winds F3-5. Temp 14-16C with poor to good visibility.
7	17/08/2022	PC	15.15	18.15	3	An overcast evening with some light rain. South-westerly winds F3-4. Temp 15-14C with good visibility.

Breeding September 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	05/09/2022	PC	15.30	18.30	3	Light rain (0.1mm), dull and very windy. Cloud cover 8/8. Southeast wind F5-7. Temp 19C with moderate visibility.
1	06/09/2022	PC	07.30	10.30	3	Dry day (0.0mm). Cloud cover 8/8. South-easterly winds F5-6. Temp 15C with good visibility.
2	05/09/2022	PC	12.00	15.00	3	Dry, windy and sunny day (0.0mm). Cloud cover 4/8. South-easterly winds F5-7. Temp 20C with good visibility.
2	23/09/2022	PC	10.50	13.50	3	Dry and sunny (0.0mm). Cloud cover 5/8. South-westerly winds F2. Temp 12C with moderate visibility.
3	08/09/2022	PC	10.15	13.15	3	Dry and sunny (0.0mm). Cloud cover 5/8. North-easterly winds F1-2. Temp 17C with good visibility.
3	23/09/2022	PC	07.20	10.20	3	Dull, cloudy day. Light consistent rain (0.1mm). Weather cleared after 9.10am. Cloud coverage (8/8. South-westerly winds F2. Temp 12C with moderate visibility.
4	01/09/2022	SC	11.00	14.00	3	Warm sunny day. Cloud coverage 8/8. East-south-easterly winds F2. Temp 18-19C with good visibility.
4	12/09/2022	SC	15.30	20.30	3	Bright, overcast evening. Cloud coverage 8/8. Northerly winds F3-4. Temp 14-17C with good visibility.
5	02/09/2022	SC	09.00	12.00	3	An overcast dull day with low cloud on hilltops and valleys. Cloud coverage 8/8. Southerly winds F2-4. Temp 15-13C with moderate to good visibility.
5	01/09/2022	SC	15.00	18.00	3	A warm sunny day. Cloud coverage 5/8. East to northerly winds F 1-2. Temp 20-17C with good visibility.
6	07/09/2022	PC	11.30	14.30	3	Dry, sunny day. Light rain from 12:30 (0.0mm – 0.2mm). Cloud coverage 7/8. Easterly winds F1-2. Temp 17C with good visibility.
6	09/09/2022	PC	07.30	10.30	3	Dry, sunny conditions (0.0mm) Cloud coverage 6/8. North-westerly winds F1-2. Temp 13C with good visibility.
7	12/09/2022	SC	13.30	16.30	3	Overcast. Cloud coverage 8/8. Northerly winds F3-4. Temp 15-16C with good visibility.
7	16/09/2022	SC	09.00	12.00	3	A bright, cool morning with some sunny spells and light showers. Cloud coverage 6/8 – 7/8. Northerly winds F3-4. Temp 12-13C with good visibility.

Winter Survey 2022/2023

Winter October 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	18/10/2022	PC	08.30	11.30	3	Good visibility, E gentle breeze with no rain, temp 5C
1	03/10/2022	PC	16.00	19.00	3	S moderate breeze. Good visibility with no rain, temp 15C
2	17/10/2022	PC	09.00	12.00	3	E strong breeze, good visibility with drizzle and temp 6C
2	18/10/2022	PC	12.00	15.00	3	E gentle breeze, good visibility with no rain, temp 13C
3	24/10/2022	PC	08.10	11.10	3	SW light breeze, good visibility with no rain, temp 12C
3	24/10/2022	PC	11.40	14.40	3	SW gentle breeze, moderate visibility with light showers, temp 14C
4	05/10/2022	SC	12.30	15.30	3	W strong breeze, good visibility with heavy showers, temp 11-12C, low cloud reducing visibility at 18.10
4	04/10/2022	SC	16.00	19.00	3	NNE light breeze, good to poor visibility with heavy showers, temp 12-11C
5	04/10/2022	SC	12.30	15.30	3	SW gentle breeze, good visibility with drizzle, temp 13-14C, overcast damp day
5	04/10/2022	SC	16.00	19.00	3	W near gale winds, good visibility with no rain, temp 11C
6	06/10/2022	SC	11.00	14.00	3	WSW strong breeze, good to poor visibility with persistent rain, temp 13C, dense fog at times
6	24/10/2022	SC	16.00	19.00	3	SW fresh breeze, good visibility with light showers, temp 11-13C
7	24/10/2022	SC	12.30	15.30	3	SW fresh breeze, moderate visibility with light showers, temp 14C
7	06/10/2022	SC	14.30	17.30	3	SW fresh breeze, moderate to poor visibility with heavy showers, temp 13-14C, overcast windy day with heavy squalls

Winter November 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	18/11/2022	PC	08.00	11.00	3	SW light breeze, good visibility with no rain, temp 5C
1	15/11/2022	PC	11.30	14.30	3	SE light breeze. Good visibility with no rain, temp 8C
2	02/11/2022	SC	10.15	13.15	3	SSW gale winds, good to poor visibility with heavy showers and temp 11C, thunderstorm
2	08/11/2022	SC	14.00	17.00	3	WSW strong breeze, good visibility with no light showers, temp 10C
3	09/11/2022	SC	10.00	13.00	3	WSW strong breeze, good to moderate visibility with no heavy showers, temp 10C
3	02/11/2022	SC	13.45	16.45	3	SSW gale winds, good visibility with heavy showers, temp 10C, first hour showers, continuous rain afterwards
4	03/11/2022	SC	12.30	15.30	3	ESE light breeze, good to moderate visibility with heavy showers, temp 8C, ESE – NNW winds
4	01/11/2022	SC	15.00	18.00	3	SW moderate breeze, good visibility with light showers, temp 8C
5	03/11/2022	SC	09.00	12.00	3	SSE gentle breeze, good visibility with light showers, temp 8C
5	10/11/2022	SC	13.15	16.15	3	SSW gale winds, moderate visibility with heavy showers, temp 15C
6	10/11/2022	SC	09.30	12.30	3	SSW strong gale, moderate visibility with heavy showers, temp 14C
6	09/11/2022	SC	13.30	16.30	3	SSW near gale winds, moderate visibility with persistent rain, temp 11C, light rain until 14.30 then continuous rain and dense fog
7	14/11/2022	PC	07.30	10.30	3	SW gentle breeze, good visibility with no rain, temp 7C
7	15/11/2022	PC	11.10	14.10	3	SE gentle breeze, good visibility with no rain, temp 6C

Winter December 2022

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	06/12/2022	SC	07.45	10.45	3	E light breeze, good visibility with no rain, temp 5C
1	07/12/2022	SC	11.15	14.15	3	NE light breeze, good visibility with heavy showers, temp 4C
2	13/12/2022	PC	07.45	10.45	3	NE light breeze, good visibility with no rain, temp 3C
2	12/12/2022	PC	14.00	17.00	3	SE light breeze, moderate visibility with falling snow, temp 0C, light fog lingering, light snow after 15.35
3	08/12/2022	SC	08.00	11.00	3	NNE light breeze, good visibility with heavy showers and falling snow, temp 3C, sleet
3	06/12/2022	PC	07.30	10.30	3	E light winds, good visibility with light showers, temp 6C
4	01/12/2022	PC	07.30	10.30	3	SE light breeze, good visibility with no rain, temp 9C
4	02/12/2022	PC	11.00	14.00	3	SE light breeze, good visibility with no rain, temp 8C
5	02/12/2022	PC	07.30	10.30	3	SE light breeze, good visibility with no rain, temp 7C
5	01/12/2022	PC	11.00	14.00	3	SE light breeze, good visibility with no rain, temp 5C
6	13/12/2022	PC	11.15	14.15	3	NE light breeze, good visibility with no rain, temp 1C
6	12/12/2022	PC	10.30	13.30	3	SE light breeze, poor visibility with snow on ground, temp 1C
7	07/12/2022	SC	07.45	10.45	3	NNE light breeze, good visibility with light showers and falling rain, temp 4C
7	08/12/2022	SC	11.30	14.30	3	N fresh breeze, good visibility with heavy showers and falling snow, temp 3C

Winter January 2023

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	05/01/2023	SC	14.00	17.00	3	SW gale winds, moderate visibility with heavy showers, temp 7C, overcast misty day with regular misty showers and very strong wind
1	10/01/2023	SC	09.30	12.30	3	SSE moderate breeze, good visibility with no rain, temp 6C, mostly cloudy but bright day
2	12/01/2023	PC	08.30	11.30	3	SW near gale winds, moderate visibility with heavy showers, temp 5C
2	12/01/2023	PC	12.00	15.00	3	SW near gale winds, moderate visibility with heavy showers, temp 5C
3	05/01/2023	SC	10.30	13.30	3	SSW gale winds, limited visibility with persistent rain, temp 10C, overcast day with persistent rain/mist and strong wind
3	11/01/2023	SC	10.00	13.00	3	WSW near gale winds, good visibility with light rain showers, temp 6C, very windy day with intermittent rain/hail showers and sunny spells
4	16/01/2023	PC	09.30	12.30	3	N light air, good visibility with heavy frost, temp 4C
4	16/01/2023	PC	13.00	16.00	3	N light air, good visibility with light frost, temp 6C
5	09/01/2023	PC	08.30	11.30	3	W near gale winds, good visibility with heavy showers, temp 6C
5	09/01/2023	PC	12.00	15.00	3	W near gale winds, moderate visibility with heavy showers, temp 5C
6	10/01/2023	SC	13.00	16.00	3	W strong winds, poor visibility with persistent rain, temp 6C, continuous rain and strong wind
6	27/01/2023	SC	08.10	11.10	3	NW light breeze, good visibility with no rain, temp 7C
7	12/01/2023	SC	13.30	16.30	3	WSW near gale winds, moderate visibility with light showers, temp 6C, very windy overcast day with scattered showers
7	24/01/2023	SC	12.00	15.00	3	SW gentle breeze, poor visibility with no rain, temp 9C, dense fog

Winter February 2023

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	28/02/2023	SC	10.15	13.15	3	E gentle breeze, good visibility with no rain, temp 7C, overcast cool day
1	28/02/2023	SC	14.30	17.30	3	NNE gentle breeze, good visibility with no rain, temp 5C, overcast cool day
2	09/02/2023	PC	13.00	16.00	3	W light breeze, good visibility with drizzle, temp 6C
2	14/02/2023	PC	07.30	10.30	3	S fresh breeze, moderate visibility with drizzle, temp 10C
3	01/02/2023	SC	14.30	17.30	3	W fresh breeze, moderate visibility with no rain, temp 8C, overcast evening with strong winds
3	02/02/2023	SC	07.30	10.30	3	SW fresh breeze, good visibility with no rain, temp 10C
4	01/02/2023	SC	11.00	14.00	3	SW strong breeze, poor visibility with persistent rain, temp 8C, continuous misty rain with strong winds
4	15/02/2023	SC	12.30	15.30	3	SW strong breeze, good visibility with no rain, temp 9C, overcast with strong winds
5	17/02/2023	PC	07.15	10.15	3	NE light breeze, good visibility with no rain, temp 8C
5	17/02/2023	PC	10.45	13.45	3	W light breeze, good visibility with no rain, temp 10C
6	09/02/2023	PC	07.30	10.30	3	W light breeze, good visibility with no rain, temp 4C
6	14/02/2023	PC	12.20	15.20	3	S strong breeze, good visibility with drizzle and heavy frost, temp 12C
7	15/02/2023	SC	09.00	12.00	3	SW strong breeze, good visibility with no rain, temp 6C, intermittent sunshine and cloud to overcast
7	02/02/2023	SC	11.00	14.00	3	SW fresh to strong breeze, good visibility with no rain, temp 10-11C

Winter March 2023

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	26/03/2023	FC	08.00	11.00	3	W light breeze, good visibility with no rain, temp 9C
1	25/03/2023	FC	08.30	11.30	3	SW light breeze, good visibility with no rain, temp 7C
2	26/03/2023	FC	11.30	14.30	3	W light breeze, good visibility with no rain, temp 8C
2	25/03/2023	FC	12.00	15.00	3	SW light breeze, good visibility with no rain, temp 8C
3	26/03/2023	FC	15.00	18.00	3	W light breeze, good visibility with no rain, temp 11C
3	25/03/2023	FC	15.30	18.30	3	SW light breeze, good visibility with no rain, temp 10C
4	29/03/2023	FC	09.30	12.30	3	SW gentle breeze, good visibility with no rain, temp 8C
4	29/03/2023	FC	13.00	16.00	3	SW gentle breeze, good visibility with no rain, temp 8C
5	29/03/2023	FC	16.30	19.30	3	W gentle breeze, good visibility with no rain, temp 8C
5	30/03/2023	FC	07.15	10.15	3	SW moderate breeze, good visibility with heavy showers, temp 7C
6	31/03/2023	FC	07.30	10.30	3	NW light breeze, good visibility with persistent rain, temp 10C
6	31/03/2023	FC	11.00	14.00	3	NW light breeze, good visibility with persistent rain, temp 10C
7	30/03/2023	FC	10.45	13.45	3	SW light breeze, good visibility with heavy showers, temp 9C
7	30/03/2023	FC	14.15	17.15	3	SW light breeze, good visibility with heavy showers, temp 9C

Appendix 4

Target/Secondary Species Observations

Glenora Target and Secondary Species VP Observations

Hen Harrier

Hen harrier															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Hen harrier Breeding 2019															
16/04/19	3	Female	Adult	1	Heather moorland and Bog	1	10:45	Flying Hunting	4-5m	-	20	-	-	-	-
Hen harrier Winter 2019/2020															
15/10/19	1	Unknown	1 st year	1	Grassland, heather moorland and 2 nd rotation forestry	1	11:20	Flying and hunting	1-5m	-	90	-	-	-	-
23/01/20	5	Male	2 nd year	2	Bog and heather moorland Thicket and 2 nd rotation forestry	1	14:56	Flying and hunting	1-5m 20-40m		40		240		
23/01/20	4	Male	2 nd year	3	Bog and 2 nd rotation forestry	1	14:50	On ground Flying and hunting	n/a 0-50m	195		25	95		
Hen harrier Winter 2020/2021															
14/12/20	4	Male	Adult	1	Thicket	1	11:08	Perched Flying		120		240			
Hen harrier Winter 2021/2022															
10/02/22	7	Male	Adult	1	1 st and 2 nd rotation forestry	1	14:29	Flying	5-20m 20-30m		38				

Hen harrier															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Hen harrier Winter 2022/2023															
24/10/22	6	Female	Adult	1	Clear fell/1 st and 2 nd Rotation Forest	1	16:54	Flying/Circling	180-2m	-	10	2	2	30	-
28/02/23	1	Male	Adult	2	1 st rotation forestry	1	11:34	Flying	20-12m	-	53	-	-	-	-

Merlin

Merlin															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Merlin Winter 2019/2020															
19/02/20 *Incidental	5	Unknown	Adult	1	Bog	1	10:35	Flying	0-20m	-	3	2	-	-	-
Merlin Breeding 2020															
27/08/20	5	Female	Adult	1	Bog	1	14:00	Flying	1m	-	4	-	-	-	-
Merlin Winter 2022/23															
29/03/23	4	Female	Unknown	1	Bog	1	13:48	Hunting/Flying/Perched	20 -100m	90	-	20	70	-	-

Kestrel

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Kestrel Breeding 2019															
17/04/19	4	Unknown	Adult	1	Heather moorland	1	15:00	Hunting and flying	80-100m	-	-	-	60	-	-
20/06/19	7	Male	Adult	2	1 st rotation forestry and heather moorland	1	21:00	On the ground, perched, flying and hunting	20-100m	20	79	191	-	-	
22/08/19	4	Female	Adult	3	1 st rotation forestry, 2 nd rotation forestry and clear fell	1	15:35	Flying and hunting	30-50m	-	300	-	-	-	
18/09/19	1	Unknown	Unknown	4	1 st rotation forestry and 2 nd rotation forestry and heather moorland	1	16:14	Flying and hunting	20-100m	-	-	150	210	-	-
19/09/19	4	Unknown	Unknown	5	1 st rotation forestry and bog	1	17:02	Flying, hunting and being mobbed by two sparrowhawks	0->200m	-	15	15	60	180	220
20/09/19	5	Female	Adult	6A	Bog, heather moorland and rough grassland	1	10:49	Flying and hunting, perched	20->100m	88	-	160	109	-	-
				6B	Rough grassland	1	11:52	Flying	20-120m	-	-	10	20	120	
Kestrel Winter 2019/2020															
15/10/19	1	Male	Adult	1	Bog, 1 st rotation forestry and river	1	14:52	Flying and hunting	30-100m	-	-	110	71	-	-

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
16/10/19	7	Unknown	Unknown	2	1 st rotation forestry and 2 nd rotation forestry	1	13:20	Flying and hunting	50-180m				5	49	
17/10/19	5	Unknown	Unknown	3	Rough grassland, bog and heather moorland	1	15:35	Perched and flying	n/a	75					
								Flying and hunting	20-50m			2			
								Flying and hunting	50-100m				20		
18/11/19	2	Male	Juvenile	4	2 nd rotation forestry and thicket	1	15:18	Flying and hunting	20-30m	-	-	360	-	-	-
19/11/19	1	Unknown	Unknown	5	Grassland and heather moorland	1	11:22	Flying and hunting	10-20m	-	300	-	-	-	-
20/11/20	4	Unknown	Unknown	6	1 st rotation forestry	1	12:56		n/a	62					
								Flying and hunting	0-20m		10				
								Flying and hunting	20-50m			56			
								Flying and hunting	50-100m				86		
Kestrel Breeding 2020															
24/07/20	3	Male	Adult	1	1 st rotation forestry, 2 nd rotation forestry	1	09:22	Hunting Flying	50m	-	-	45	-	-	-
24/08/20	2	Unknown	Unknown	2	1 st rotation forestry, scrub	1	11:29	Hunting, flying and on the ground	40m	5	-	15	-	-	-
21/09/20	2	Unknown	Unknown	3	1 st rotation forestry, scrub	1	14:38	Flying	20-30m	-	-	40	-	-	-

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
30/09/20	7	Female	Unknown	4	Thicket	2	09:50	Hunting	20-50m	-	-	2700	-	-	-
Kestrel Winter 2020/2021															
20/11/20	2	Unknown	Unknown	1	2 nd rotation forestry, scrub	1	08:40	Flying	4m	-	10	-	-	-	-
22/11/20 *Incidental	6	Female	Adult	-	-	1	11.15	Flying	-	-	-	-	-	-	-
25/11/20	3	Unknown	Unknown	2	Bog, heather moorland	1	13:20	Flying	5m	-	15	-	-	-	-
25/11/20	1	Female	Adult	3	Forestry	1	15:20	Hunting	80m	-	-	-	14	-	-
16/12/20	2	Male	Adult	-	1 st rotation forestry	1	-	Flying	20-50m	-	-	60	-	-	-
Kestrel Breeding 2021															
24/05/21	5	Unknown	Unknown	1	Bog	1	11.27	Flying	30m	-	-	25	-	-	-
16/08/21	4	Female	Adult	2	Bog	1	12.59	Flying	4-8m	-	8	-	-	-	-
17/09/21	4	Unknown	Unknown	3	Bog, heather moorland	1	12.10	Flying	40m	-	-	16	-	-	-
17/09/21	5	Unknown	Unknown	4	Bog	1	11.00	Flying, hovering	1-10m	-	35	-	-	-	-
17/09/21	5	Unknown	Unknown	5	Bog	1	11.20	Flying	4m	-	8	-	-	-	-
Kestrel Winter 2021/2022															
12/10/21	5	Unknown	Unknown	1	Bog	1	14.56	Flying/Hunting	20-30m	-	-	5	-	-	-
13/10/21	5	Female	Adult	2	Rough & Improved Grassland/Scrub/Bog	1	10.23	Flying/Hunting/Perched/On Ground/Mobbed	N/a 0-20m	49	294				

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
									20-50m			317			
13/10/21	5	Female	Adult	3	Rough & Grassland moorland/Scrub/Bog	1	11.56	On Ground/Flying/Hunting	N/a 0-100m	45	600	645	90	-	-
13/10/21	4	Female	Adult	4	Bog/Scrub/Clear Fell/1 st & 2 nd Rotation Forest	1	16.01	Flying/Perched/ On Ground	N/a 0-15m	401	-	-	-	-	-
15/10/21	7	Unknown	Unknown	5	Bog	2	13.14	Flying/Hunting	>180m	-	-	-	-	-	360
09/11/21	1	Unknown	Unknown	6	Bog/1 st Rotation Forest	1	13.22	Flying/Hunting	0-180m	-	9	4	82	82	-
Kestrel Breeding 2022															
03/05/22	3	Female	Adult	1	Clear Fell/1 st Rotation Forest/ Bog	1	14.06	Flying/Hunting	200-180m 180-100m 100-50m 50-20m 20-0m	- - - - -	- - - - 1	- - 2 -	- - 3 -	- 24 -	- - -
07/06/22	5	Unknown	Adult	2	Rough Grassland/Bog	1	21.46	Hunting	50-100m 100-120m	- -	- -	- -	90 -	90 -	-
15/06/22	1	Unknown	Adult	3	Bog/ Heather moorland	1	21.13	Flying/ Hunting	0-20m 20-50m 50-100m 100-180m	- - - -	2 - - -	- 2 -	- - 168 -	- - -	- - -
08/07/22	3	Unknown	Adult	4	Heather moorland/ Clear Fell/1 st Rotation Forest	1	13.57	Flying/ Hunting	30-50m 50-100m 100-150m	- - -	- - -	20 -	- 20 -	- -	- 20 -
05/08/22	3	Unknown	Unknown	5	Heather moorland/ Thicket/2 nd Rotation Forest/ Bog	2	12.37	Flying/Hunting/ Mobbing	50-100m 100-180m >180	- - -	- - -	- -	30 -	- 30 -	- -

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
05/08/22	3	Unknown	Unknown	6	Heather moorland/ Thicket/1 st and 2 nd Rotation Forest/ Bog	2	13:12	Flying/Hunting/ Mobbing	1-20m 20-50m 50-100m 100-150m	- - - -	75 - - -	- 75 - -	- - 75 -	- - - 75	- - - -
09/08/22	4	Unknown	Unknown	7	Bog	1	17:54	Flying/Hunting/ On Ground	0-20m 20-40m N/a	- - 26	73 - -	- 47 -	- - -	- - -	- - -
18/08/22	7	Unknown	Unknown	8	Heather moorland/Bog	1	12:41	Flying/Hunting	2-20m 20-50m	- -	210 -	- 210	- -	- -	- -
06/09/22	1	Unknown	Unknown	9	Bog	1	08:24	Flying/Hunting	10m	-	8	-	-	-	-
12/09/22	4	Unknown	Juvenile	10	Clear Fell/ 1 st Rotation Forest/ Rough Grassland/Scrub/Bog	1	17:57	Flying/ Hovering/ On ground	N/a 0-20m 20-50m 50-100m	6 - - -	- 129 - -	- - 40 -	- - - 84	- - - -	- - - -
23/09/22	3	Female	Juvenile	11	Bog/ 1 st Rotation Forestry/ Clear Fell	1	8:42	Flying/Hunting	16-20m	-	39	-	-	-	-
23/09/22	3	Female	Juvenile	12	Clear Fell	1	9:04	Perched/Flying	N/a 10m	20 -	- 3	- -	- -	- -	- -
23/09/22	2	Female	Adult	13	1 st Rotation Forest/ Scrub	1	10:51	Perched/Flying	N/a 35m	780 -	- -	- 42	- -	- -	- -
23/09/22	2	Female	Adult	14	1 st Rotation Forest	1	11:18	Flying/Soaring	40-50m	-	-	66	-	-	-
Kestrel Winter 2022/2023															
05/10/22	4	Unknown	Unknown	1	Bog/1 st rotation forest/river	1	14:27	Hunting and flying	0-25m	-	139	3	-	-	-
05/10/22	5	Unknown	Juvenile	2	Scrub/1 st rotation forestry	1	16:11	Flying	3-5m	-	20	-	-	-	-
17/10/22	2	Unknown	Unknown	3	Bog	1	09:14	Hunting, Flying	10	-	32	-	-	-	-
18/10/22	1	Unknown	Unknown	4	1 st rotation forestry	1	10:55	Hunting, Flying	20m	-	27	-	-	-	-

Kestrel															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
24/10/22	7	Unknown	Unknown	5	1 st rotation forestry	1	14:11	Perched/Flying	12-20m	88	35	-	-	-	-
02/11/22	2	Male	Adult	6	1 st and 2 nd rotation forestry/Thicket/Clear fell/River	1	11:03	Flying, Hunting	4-100m	-	90	90	90	-	-
02/11/22	2	Unknown	Juvenile	7	River/1 st and 2 nd rotation forestry/Thicket	1	12:26	Flying/Hunting	5-100m	-	132	132	132	-	-
09/11/22	3	Unknown	Juvenile	8	Clear fell/1 st Rotation forestry/thicket	1	10:55	Hunting, Flying	4-50m	-	305	104	-	-	-
15/11/22	1	Unknown	Unknown	9	Clear fell	1	12:29	Flying, Hunting	30m	-	-	91	-	-	-
18/11/22	1	Unknown	Unknown	10	1 st Rotation forestry/Clear fell/Scrub	1	10:49	Flying	30-40m	-	-	21	-	-	-

Buzzard

Buzzard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Buzzard Breeding 2019															
23/05/19	5	Unknown	Adult	1	Bog Heather moorland, pine tree	1	08:02	Flying Hunting and perched on a tree	30-40m	660	-	30	-	-	-
23/05/19	4	Unknown	Adult	2	Bog	1	09:51	Perched on a tree	0-50m	-	1	2	-	-	-

Buzzard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
17/09/19	2	Unknown	Adult	3	1 st rotation forestry and 2 nd rotation	1	11:11	Flying and being mobbed by a raven	>200m	-	-	-	-	-	222
20/09/19	5	Unknown	Adult	4	Improved grassland and rough grassland	1	10.15	Flying	20-40m	-	-	17	-	-	-
Buzzard Winter 2019/2020															
27/03/20	1	Unknown	Adult	1	Forest	1	13:15	Soaring	200m	-	-	-	-	-	10
Buzzard Breeding 2021															
28/05/21	3	Unknown	Unknown	1	1 st rotation forestry, clear fell	1	12.34	Perched Flying, hunting,	N/a 6m	140	-	-	-	-	-
14/06/21	3	Unknown	Unknown	2	Bog, 1 st rotation forestry, clear fell	1	09.52	Circling, flying, hunting	25m-30m	-	-	180	-	-	-
15/07/21	3	Unknown	Unknown	3	1 st rotation forestry	1	11.22	Hunting, flying	18m	-	8	-	-	-	-
15/07/21	2	Unknown	Adult	4	1 st rotation forestry	1	11.28	Flying	20-50m	-	-	7	-	-	-
23/08/21	3	Unknown	Adult	5	Forestry	1	13.51	Flying, soaring	80-200m	-	-	-	90	20	160
Buzzard Breeding 2022															
13/04/22	7	Unknown	Adult	1	1 st & 2 nd Rotation forestry/Clear fell	1	16.01	Flying/ Soaring	20-50m 50-100m 100-180m >180m	- - - -	- - - -	2 - - -	- 2 - -	- - 2 -	- - - 259
13/06/22 *Incidental	1	Unknown	Adult	2	2 nd Rotation forestry/Clear fell	1	16.26	Flying	30-40m	-	-	35	-	-	-
13/06/22 *Incidental	1	Unknown	Adult	3	2 nd Rotation forestry/Clear fell	1	16.28	Flying	5-10m	-	6	-	-	-	-

Buzzard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
13/06/22	1	Unknown	Adult	4	2 nd Rotation forestry/Clear fell	2	18.14	Flying/ Hunting /Soaring	18-20m 20-50m 50-100m 100-180m 180-200m	- - - - -	60 - - - -	- 60 - - -	- - 60 - -	- - - 60 -	- - - - 60
13/06/22 *Incidental	6	Unknown	Adult	5	2 nd Rotation forestry/Clear fell	1	19.44	Flying	7-10m	-	10	-	-	-	-
08/07/22	3	Unknown	Adult	6	1 st & 2 nd Rotation forestry/Clear fell	1	12.37	Flying/ Hunting	30-50m 50-70m	- -	- -	35 -	- 115	- -	- -
08/07/22	3	Unknown	Adult	7	Heather moorland/1 st & 2 nd Rotation forestry	1	13.49	Flying/ Hunting /Soaring	1-20m 20-50m 50-100m	- - -	270 - -	- 270 -	- - 120	- - -	- - -
29/07/22	7	Unknown	Adult	8	2 nd Rotation forestry/Clear fell/Thicket	1	14.25	Flying/ Hunting	5-20m 20-50m 50-100m 100-120m	- - - -	30 - - -	- 30 -	- 30 -	- - 30 -	- - - -
29/07/22	7	Unknown	Adult	9	1 st Rotation forestry/Clear fell/Thicket	1	14.42	Flying/ Hunting/ Circling	0-20m 20-50m 50-100m 100-180m 180-200m	- - - - -	100 - - - -	- 100 -	- - 335 -	- - 335 -	- - - 335
04/08/22	3	Unknown	Adult	10	2 nd Rotation forestry/Thicket/ Clear fell	1	17.40	Flying/ Hunting	0-20m	-	660	-	-	-	-
09/08/22	5	Unknown	Unknown	11	River/Heather moorland/ 1 st Rotation forestry	2	15.02	Flying/ Soaring/ Circling	20-50m 50-100m 100-180m >180m	- - - -	- - - -	100 - -	- 5 -	- - 5	- - - 424
11/08/22	6	Unknown	Adult	12	1 st and 2 nd Rotation forestry/River/Scrub/ Clear fell	1	11.55	Flying/ Soaring/ Circling	0-20m 20-50m 50-100m	- - -	2 - -	- 2 -	- - 2	- - -	- - -

Buzard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
									100-180m	-	-	-	-	2	-
									>180m	-	-	-	-	-	189
11/08/22	6	Unknown	Adult	13	Bog/1 st Rotation forestry	1	12.25	Flying/ Perched	1-4m N/a	- 50	38 -	- -	- -	- -	- -
22/08/22	2	Unknown	Unknown	14	1 st Rotation forestry	1	13.18	Flying	38m	-	-	6	-	-	-

Golden plover

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Golden plover Breeding 2019															
16/04/19	3	Unknown	Adults	1	Heather, bog Heather, bog Heather bog, 1 st rotation forestry 1 st rotation forestry, bog and heather moorland	45	10:45	Flying	0->200m	-	2	3	5	5	120
18/09/19	6	Unknown	Unknown	2	2 nd rotation forestry and thicket	45	16:32	Flying	20-300m	-	2	3	15	10	50
Golden plover Winter 2019/2020															

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
16/10/19	7	Unknown	Adult	1A	1 st rotation forestry and 2 nd rotation forestry, heather and bog	24	11:45	Flying	20->180m	-	-	60	29	5	79
16/10/19	7	Unknown	Adult	1B	1 st rotation forestry and 2 nd rotation forestry, heather and bog	23	14:11	Flying	>1000m	-	-	-	-	-	270
16/10/19	6	Unknown	Unknown	2	Heather moorland	50	12:05	Flying and circling	20-30m 50-80m			50	30		
16/10/19	7	Unknown	Adult	3	Heather moorland and bog	15	16:48	Flying, on ground and circling	0-100m	-	1	1	1	101	-
18/10/19	2	Unknown	Unknown	4	1 st rotation forestry and 2 nd rotation forestry	40	09:50	Flying	200m	-	-	-	-	-	20
18/10/19	3	Unknown	Unknown	5	1 st rotation forestry and 2 nd rotation forestry, heather and thicket	29	13:32	Flying	200m	-	-	-	-	-	20
22/01/20	6	Unknown	Adult	6	Forestry, 1 st rotation forestry and bog	80	12:30	Flying	>180m	-	-	-	-	-	20
22/01/20 *Incidental	6	Unknown	Adult	7	-	-	13:28	Heard calling	-	10,020	-	-	-	-	-
23/03/20	4	Unknown	Adult	8	Bog	80	13:11	Flying Circling	90m 20m				70		
Golden plover Breeding 2020															
30/09/20	6	Unknown	Unknown	1	Bog	40	13:15	Flying	3-4m	-	4	-	-	-	-
Golden plover Winter 2020/2021															
14/12/20	4	Unknown	Unknown	1A	Bog	84	12:36	Flying	50-100m				30	180	

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
				1B					100-180m						
14/12/20	6	Unknown	Unknown	2	Bog, heather moorland	1	13:22	Calling, flying, on ground	1m	-	2	-	-	-	-
14/12/20	4	Unknown	Unknown	3	Bog	1	14:36	Flying	50-100m	-	-	-	300	-	-
21/01/21	6	Unknown	Unknown	4	Heather moorland	3	12:06	Flying	2m	-	4	-	-	-	-
21/01/21	6	Unknown	Unknown	5	Heather moorland	18	12:20	Flying	20m	-	26	-	-	-	-
21/01/21	5	Unknown	Unknown	6	Bog	1	-	Flying	40m	-	-	180	-	-	-
24/02/21	7	Unknown	Unknown	7	Heather moorland	12	11:30	Flying	15m	-	7	-	-	-	-
24/02/21	1	Unknown	Unknown	8	Heather moorland	200	13:43	Circling	250-300m	-	-	-	-	-	360
Golden plover Breeding 2021															
21/04/21	4	Unknown	Unknown	1	Bog	23	15.10	Flying	90m	-	--	-	40	-	-
17/09/21 *Incidental	5	Unknown	Unknown	-	Bog	1	10.00	Heard calling over VP but not seen.	-	-	-	-	-	-	-
Golden plover Winter 2021/2022															
12/10/21	5	Unknown	Unknown	1	Bog/Scrub/Thicket /1 st & 2 nd Rotation Forest	25	15.08	Flying/Circling	0->180m	-	60	60	60	60	600
12/10/21	5	Unknown	Unknown	2	Bog/Scrub	24	16.08	Flying/Circling	0->180m	-	120	120	60	60	600
13/10/21	5	Unknown	Unknown	3	Bog	16	10.50	Flying	>180m	-	-	-	-	-	10
13/10/21	5	Unknown	Unknown	4	Bog	2	11.10	Flying	10-15m	-	15	-	-	-	-
14/10/21	6	Unknown	Unknown	5	Bog	30	14.20	Flying	0-5m	-	5	-	-	-	-

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
14/10/21	7	Unknown	Unknown	6	Bog	2	14.22	Flying	2m	-	8	-	-	-	-
15/10/21	1	Unknown	Unknown	7	Bog	11	10.02	Flying	5	-	15	-	-	-	-
15/10/21	7	Unknown	Unknown	8	Bog	60	11.10	Flying	0-20m	-	10	-	-	-	-
15/10/21	2	Unknown	Unknown	9	Bog	28	11.14	Flying	22m	-	-	20	-	-	-
15/10/21	7	Unknown	Unknown	10	Bog	1	12.30	Flying	100-180m	-	-	-	-	59	-
15/10/21	7	Unknown	Unknown	11	Bog/Thicket /1 st & 2 nd Rotation Forest	26	12.45	Flying	180-1000	-	-	-	-	-	300
11/11/21 *Incidental	5	Unknown	Unknown	-	-	-	10.05	Heard calling	-	-	-	-	-	-	-
11/11/21 *Incidental	4	Unknown	Unknown	-	-	-	11.16 12.55	Heard calling	-	-	-	-	-	-	-
16/11/21	1	Unknown	Unknown	12	Bog/1 st & 2 nd Rotation Forest	25	13.47	Flying	200-300m	-	-	-	-	-	238
08/12/21	5	Unknown	Unknown	13	Bog	4	10.24	Flying	0-5m	-	12	-	-	-	-
09/12/21	7	Unknown	Unknown	14	Bog/1st & 2nd Rotation Forest	3	13.09	Flying	55m	-	-	-	34	-	-
09/12/21	6	Unknown	Unknown	15	Thicket/Bog	170	13.52	Flying/Circling/ On Ground	N/a 0-100m	7560	60	60	60	-	-
09/12/21	6	Unknown	Unknown	16	Thicket/Bog	5	14.52	Flying	0-5m	-	46	-	-	-	-
10/12/21	6	Unknown	Unknown	17	Bog	8	11.02	Ground, Flying	N/a 0-20m	7065	15	-	-	-	-
10/12/21	6	Unknown	Unknown	18	Thicket/Bog	19	11.20	Ground/Flying/ Soaring	N/a	4780	-	-	-	-	-

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
									0-1m		20				
11/01/22 *Incidental	6	Unknown	Unknown	-	-	-	08.21	Heard calling/Not seen	-	-	-	-	-	-	-
11/01/22 *Incidental	6	Unknown	Unknown	-	-	-	10.48	Heard calling/Not seen	-	-	-	-	-	-	-
11/01/22	4	Unknown	Unknown	19	Bog	31	10.57	Flying	>180m	-	-	-	-	-	50
11/01/22	4	Unknown	Unknown	20	Bog	7	11.15	Flying	20->180m	-	-	2	25	48	239
11/01/22 *Incidental	6	Unknown	Unknown	-	-	-	08.21 10.48	Heard calling/Not seen	-	-	-	-	-	-	-
13/01/22 *Incidental	5	Unknown	Unknown	-	-	-	10.08	Heard calling/Not seen	-	-	-	-	-	-	-
13/01/22 *Incidental	4	Unknown	Unknown	-	-	-	15.27	Heard calling/Not seen	-	-	-	-	-	-	-
14/01/22	6	Unknown	Unknown	21	Bog/Heather moorland	52	12.46	Flying	25m	-	-	35	-	-	-
14/01/22 *Incidental	6	Unknown	Unknown	-	-	-	12.53 14.38	Heard calling/Not seen	-	-	-	-	-	-	-
08/02/22 *Incidental	7	Unknown	Unknown	22	Forestry, bog, scrub, clearfell	5	15.12	Heard calling, Flying	200m	-	-	-	-	-	86
08/02/22	7	Unknown	Unknown	23	Bog	13	17.34	Flying	1m	-	4	-	-	-	-
02/03/22 *Incidental	6	Unknown	Unknown	24	Bog	5	10.46	Flying	0-2m	-	3	-	-	-	-
03/03/22	1	Unknown	Unknown	25	Bog	82	12.09	Flying/Circling	100-220m	-	-	-	-	120	180
09/03/22 *Incidental	5	Unknown	Unknown	26	Bog	14	10.25	On ground/Flying/Circling	0-50m	-	90	90	-	-	-
11/03/22	4	Unknown	Unknown	27	Bog	99	12.11	On ground/Flying/Circling	15-0m	-	240	-	-	-	-

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
11/03/22	4	Unknown	Unknown	28	Bog	27	12.21	On ground/Flying	0-10m	-	5	-	-	-	-
11/03/22	4	Unknown	Unknown	29	Bog	41	12.53	Flying/Circling	2-30m	-	30	30	-	-	-
23/03/22	7	Unknown	Unknown	30	Bog	8	15.38	Flying	3-4m	-	13	-	-	-	-
Golden plover Breeding 2022															
04/04/22	4	Unknown	Unknown	1	Bog	26	18.11	Flying/On Ground/Circling	N/a 0-5m	3,390		-	-	-	-
04/04/22	4	Unknown	Unknown	2	Bog	26	19.11	Flying/Circling	0-20m 20-50m 50-100m 100-180m	- - - -	176 - - -	- 84 -	- -	- 43	- -
07/04/22	6	Unknown	Unknown	3	Bog/Heather moorland	62	13.34	Flying/On Ground	N/a 0-20m	400 -	- 200	- -	- -	- -	- -
07/04/22	6	Unknown	Unknown	4	Bog/Heather moorland/1 st & 2 nd Rotation Forest/Thicket	62	13.45	Flying	150-180m 180-200m	- -	- -	- -	- -	120 -	- 120
13/04/22 *Incidental	7	Unknown	Unknown	-	-	1	14.02	Heard calling	-	-	-	-	-	-	-
14/04/22	7	Unknown	Unknown	5	Bog	32	11.31	Flying/Circling	0-20m 20-50m 50-100m 100-180m	- - - -	55 - - -	- 55 -	- -	- 55	- -
14/04/22	7	Unknown	Unknown	6	Bog/1 st & 2 nd Rotation Forest	6	12.51	Flying	50-100m 100-180m >180m	- - -	- - -	- -	- -	37 22	- - 62
Golden plover Winter 2022/2023															

Golden plover															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
06/10/22	6	Unknown	Unknown	1	Bog	86	13:00	Flying	<1-15m	-	240	-	-	-	-
24/10/22	3	Unknown	Unknown	2	Bog/1 st Rotation forestry	18	13:18	Flying	50m	-	-	42	-	-	-
01/11/22 *Incidental	4	Unknown	Unknown	3	Bog/Cutover bog	86	15:00	On ground	0m	10800	-	-	-	-	-
03/11/22	5	Unknown	Unknown	4	1 st Rotation forestry/River/Bog/Scrub	77	10:49	Flying, Circling	300m	-	-	-	-	-	840
03/11/22	5	Unknown	Unknown	5	1 st Rotation forestry/Bog/Scrub/River	51	11:36	Flying, Circling	0->180m	-	180	60	60	330	330
03/11/22	4	Unknown	Unknown	6	Bog	21	12:30	On ground	0m	10800	-	-	-	-	-
03/11/22	4	Unknown	Unknown	7	Bog	14	13:06	Flying, Circling	>200m	-	-	-	-	-	1380
10/11/22	6	Unknown	Unknown	8	Bog	12	10:45	Flying	1	-	4	-	-	-	-
10/11/22	6	Unknown	Unknown	9	Bog	28	10:51	Flying/On ground	0-2m	-	37	-	-	-	-
15/11/22	7	Unknown	Unknown	-	-	-	-	Heard	-	-	-	-	-	-	-
01/12/22 *Incidental	5	Unknown	Unknown	-	-	-	-	Heard	-	-	-	-	-	-	-
12/12/22	6	Unknown	Unknown	10	Bog	27	12:56	Flying	1-2m	-	8	-	-	-	-
14/02/23 *Incidental	6	Unknown	Unknown	11	Bog	1	12:44	Heard calling only	-	-	-	-	-	-	-
15/02/22	7	Unknown	Adult	12	Bog, 1 st and 2 nd Rotation forestry	13	10:29	Circling, Flying	200	-	100	30	30	40	40
17/02/23 *Incidental	5	Unknown	Unknown	13	Bog	1	12:12	Heard calling only	-	-	-	-	-	-	-
17/02/23 *Incidental	6	Unknown	Unknown	14	Bog	1	-	Heard calling only	-	-	-	-	-	-	-

Woodcock

Woodcock															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Woodcock Winter 2019/2020															
20/01/20	2	Unknown	Adult	1	2 nd rotation Forestry	1	14:35	Flying	0-3m	-	4	-	-	-	-
Woodcock Winter 2021/2022															
09/12/21 *Incidental	3	Unknown	Unknown	-	Barrier into site	8	-	Flying	-	-	-	-	-	-	-
09/12/21 *Incidental	1	Unknown	Unknown	1	2 nd Rotation Forest	1	09.20	Flying	0-2m	-	4	-	-	-	-
09/12/21 *Incidental	1	Unknown	Unknown	2	River, scrub	1	12.40	Flying	0-2m	-	5	-	-	-	-
10/12/21	3	Unknown	Unknown	3	1 st Rotation Forest and 2 nd Rotation Forest	1	13.30	Flying	0-3m	-	5	-	-	-	-
10/12/21	3	Unknown	Unknown	4	1 st Rotation Forest and 2 nd Rotation Forest	1	15.17	Flying	0-2m	-	4	-	-	-	-
13/12/21	2	Unknown	Unknown	5	1 st Rotation Forest	1	09.45	Flying	10m	-	3	-	-	-	-
11/01/22 *Incidental	-	Unknown	Unknown	-	Flushed on way to VP6	1	-	Flying	-	-	-	-	-	-	-
14/01/22 *Incidental	-	Unknown	Unknown	-	Flushed on way to VP7	1	-	Flying	-	-	-	-	-	-	-
14/01/22 *Incidental	-	Unknown	Unknown	-	Flushed on way out of site from VP3	2	-	Flying	-	-	-	-	-	-	-
07/02/22 *Incidental	-	Unknown	Unknown	6	Flushed on way out of site in 1 st Rotation Forest	1	18.20	Flying	0-1m	-	2	-	-	-	-
				7		18.23	0-3m		-	3	-	-	-		
				8		18.26	0-4m		-	4	-	-	-		
				9		18.28	0-5m		-	3	-	-	-		
				10		18.28	0-6m		-	3	-	-	-		
08/02/22 *Incidental	-	Unknown	Unknown	11	Flushed on way out of site in 1 st Rotation Forest	1	18.12	Flying	0-2m	-	2	-	-	-	-
				12					18.12	0-6m	-	6	-	-	-

Woodcock															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
01/03/22 *Incidental	-	Unknown	Unknown	13	Flushed on way out of site in 1 st and 2 nd Rotation Forest	1	19.01	Flying	0-1m	-	3	-	-	-	-
03/03/22 *Incidental	-	Unknown	Unknown	14	Flushed on way to VP4 on Bog and 1 st Rotation Forest	1	06.40	Flying	0-4m	-	5	-	-	-	-
09/03/22 *Incidental	-	Unknown	Unknown	15	Flushed on way to VP2 in 1 st Rotation Forest	1	06.39	Flying	0-8m	-	2	-	-	-	-
				16		1	06.39		0-5m		3				
				17		1	06.40		0-5m		4				
				18		1	06.41		0-2m		2				
				19		1	06.41		0-2m		3				
10/03/22 *Incidental	-	Unknown	Unknown	-	Flushed on way to VP3	4	-	Flying	-	-	-	-	-	-	-
11/03/22 *Incidental	-	Unknown	Unknown	20	Flushed on way out of site in 1 st Rotation Forest	1	09.45	Flying	0-4m	-	4	-	-	-	-
Woodcock Winter 2022/2023															
24/10/22 *Incidental	6	Unknown	Unknown	1	Track/1 st Rotation forestry	1	19:04	On ground, Flying	0-2m	15	3	-	-	-	-
06/12/22 *Incidental	1	Unknown	Adult	2	1 st Rotation forestry	1	07:31	Flying	0-3m	-	3	-	-	-	-
06/12/22 *Incidental	1	Unknown	Unknown	3	1 st Rotation forestry	1	07:32	Flying	0-4m	-	5	-	-	-	-
06/12/22 *Incidental	1	Unknown	Unknown	4	1 st Rotation forestry	1	07:33	Flying	0-2m	-	3	-	-	-	-
06/12/22 *Incidental	1	Unknown	Unknown	5	1 st Rotation forestry	1	07:34	Flying	0-3m	-	4	-	-	-	-
06/12/22 *Incidental	1	Unknown	Unknown	6	1 st Rotation forestry	1	07:34	Flying	0-4m	-	4	-	-	-	-

Woodcock															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
06/12/22 *Incidental	1	Unknown	Unknown	7	1 st Rotation forestry	1	07:40	Flying	4m	-	4	-	-	-	-
08/12/22 *Incidental	3	Unknown	Adult	8	1 st Rotation forestry	1	07:56	Flying	6-7m	-	6	-	-	-	-
08/12/22 *Incidental	3	Unknown	Adult	9	1 st Rotation forestry	2	07:57	Flying	4-5m	-	4	-	-	-	-
08/12/22 *Incidental	3	Unknown	Unknown	10	1 st Rotation forestry	2	07:58	Flying	4-5m	-	5	-	-	-	-
08/12/22 *Incidental	3	Unknown	Unknown	11	1 st Rotation forestry	1	07:59	Flying	2-3m	-	5	-	-	-	-
12/12/22 *Incidental	2	Unknown	Unknown	12	1 st Rotation forestry	1	17:08	Flying	-	-	-	-	-	-	-
13/12/22 *Incidental	2	Unknown	Unknown	13	1 st Rotation forestry	1	07:36	Flying	-	-	-	-	-	-	-
13/12/22 *Incidental	2	Unknown	Unknown	14	1 st Rotation forestry	1	07:37	Flying	-	-	-	-	-	-	-
15/02/23	7	Unknown	Adult	15	1 st Rotation forestry	1	09:15	Flushed Flying	<1-3m	-	4	-	-	-	-

Sparrowhawk

Sparrowhawk															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Sparrowhawk Breeding 2019															
16/04/19	3	Male	Adult	1	1st rotation forestry and 2nd rotation forestry	1	15:46	Hunting	6-12m	-	5	-	-	-	-

Sparrowhawk																
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category						
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m	
18/04/19	6	Male	Adult	2	1 st rotation forestry	1	11:44	Flying	5-15m	-	20	-	-	-	-	
19/06/19	2	Male	Adult	3	1 st rotation forestry and 2 nd rotation forestry	1	19:46	Flying	50-100m	-	-	-	6	-	-	
16/07/19	6	Male	Adult	4	heather moorland, 1 st rotation forestry and grassland moorland	1	08:06	Flying	20-50m	-	64	-	-	-		
19/08/19	3	Male and Female	Adults	5A	Heather moorland, 1 st rotation forestry and 2 nd rotation forestry	1	18:40	Flying and displaying	30-100m	-	50	50	-	-		
				5B	Heather moorland, 1 st rotation forestry and 2 nd rotation forestry	1			0-100m	-	5	142	-	-		
18/09/19	1	Unknown	Unknown	6A	1 st rotation forestry and 2 nd rotation forestry and heather moorland	2	13:51	Flying and circling	20->200m	-	10	20	185	270		
				6B							10	20	5	270		
19/09/19	4	Unknown	Adult	7A	1 st rotation forestry	2	17:03	Flying and mobbing a kestrel	20->200m	-	-	-	-	60		
				7B						-	2	3	3	60		
19/09/19	5	Female	Adult	8	Grassland and heather moorland	1	16:32	Flying, hunting and mobbing ravens	1-5m	-	1080	-	-	-		
Sparrowhawk Breeding 2020																
20/05/20 *Incidental	2	Female	Adult	1	1 st rotation forestry	1	09:34	Hunting	80m	-	-	-	65	-	-	

Sparrowhawk															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
24/08/20	3	Female	Adult	2	Clearfell, scrub	1	14:13	Hunting Flying	20m	-	90	-	-	-	-
21/09/20	3	Unknown	Unknown	3	Clearfell, bog, 1 st rotation forestry	1	09:40	Perched, flying and hunting	20-30m	300	-	60	-	-	-
21/09/20	3	Female	Adult	4	Clearfell	1	10:58	Perched, Flying	N/a 15m	10 -	5	-	-	-	-
30/09/20	7	Female	Adult	5	Thicket	1	10:54	Hovering, hunting	30m	-	-	18	-	-	-
Sparrowhawk Winter 2020/2021															
16/12/20	3	Female	Adult	1	1 st rotation forestry	1	13:58	Flying	1m	-	3	-	-	-	-
Sparrowhawk Breeding 2021															
28/05/21	3	Unknown	Unknown	-	1 st rotation forestry, rough grassland	1	12.45	Flying	1m	-	3	-	-	-	-
19/07/21	3	Female	Adult	-	Clear fell	1	08.41	Flying	2m	-	6	-	-	-	-
Sparrowhawk Winter 2021/2022															
12/10/21	5	Male	Adult	1	Bog	1	15.07	Flying	0-3m	-	35	-	-	-	-
14/10/21	3	Male	Adult	2	2 nd Rotation Forest	1	12.12	Flying	6-7m	-	64	-	-	-	-
01/03/22	2	Female	Adult	3	1 st and 2 nd rotation forestry	1	14.14	Flying	5-200m	-	3	3	3	15	20
Sparrowhawk Breeding 2022															
14/04/22	7	Female	Adult	1	1 st and 2 nd rotation forestry/ Thicket	1	12.06	Flying/ Soaring	30-50m 50-100m	-	-	18	18	-	-

Sparrowhawk															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
17/08/22	7	Female	Adult	2	1 st Rotation Forest/Thicket/ Fire break	1	17.16	Flying	2-15m	-	6	-	-	-	-
22/08/22	2	Male	Adult	3	1 st Rotation forestry	1	14.29	Flying/Hunting	4-5m	-	12	-	-	-	-
01/09/22	4	Unknown	Unknown	4	1 st Rotation Forest/Bog	1	12:52	Flying/Soaring/Circling	12-20m 20-50m 50-100m	-	49	-	49	-	-
Sparrowhawk Winter 2022/2023															
03/11/22	5	Female	Unknown	1	River/1 st rotation forestry/Bog/Scrub	1	09:50	Perched/Flying	<1-3m	58	19	-	-	-	-
02/12/22	4	Unknown	Unknown	2	1 st Rotation forestry/Clear fell	1	11:21	Flying, Hunting	3m	-	5	-	-	-	-
07/12/22	1	Unknown	Unknown	3	1 st and 2 nd Rotation forestry/Clear fell	1	12:03	Flying, Displaying	200-0m	-	1	1	1	1	92
07/12/22	1	Female	Adult	4,5,6	1 st and 2 nd Rotation forestry	1	12:15	Flying, Perched	4-7m	35	17	-	-	-	-

Peregrine falcon

Peregrine falcon															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Peregrine falcon Breeding 2019															
17/09/19	3	Male	Adult	1	2 nd rotation forestry and thicket	1	12:18	Flying, hunting, circling and soaring	60-300m	-	-	-	240	5	20

Peregrine falcon															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Peregrine falcon Winter 2019/2020															
15/10/19	1	Unknown	Unknown	1	Heather moorland, thicket, 2 nd rotation forestry	1	-	Flying, hunting	40-80m	-	-	20	80	-	-
16/10/19	6	Female	Adult	2	Heather, thicket	1	14:58	Flying, hunting	30-70m	-	-	5	5	-	-
Peregrine falcon Winter 2020/2021															
14/12/20	2	Male	Adult	1	Bog, 1 st rotation forestry	1	10:02	Flying, hunting, soaring, circling	30m	-	-	120	-	-	-
22/03/21	2	Male	Adult	2	Forestry	1	14:02	Flying	45m	-	-	5	-	-	-
Peregrine falcon Breeding 2021															
19/08/21	5	Unknown	Adult	1	Bog	1	13.24	Hunting	90-100m	-	-	-	24	-	-
Peregrine falcon Winter 2021/2022															
13/10/21	5	Male	Adult	1	Scrub/Bog	1	10.34	Flying/Hunting /Perched	N/a 0-5m	1,241	19	-	-	-	-
11/01/22	5	Unknown	Juvenile	2	Bog/ Rough Grassland/River	1	16.06	Flying	0-100m	-	20	10	40	-	-
Peregrine falcon Winter 2022/2023															
24/10/22	3	Unknown	Unknown	1	Bog, 1 st rotation forestry	1	13:18	Hunting, Flying	80-90m	-	-	-	38	-	-

Snipe

Snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Snipe Breeding 2019															
21/05/19	7	Unknown	Unknown	/	Unknown	1	07:06	Heard drumming	-	-	-	-	-	-	-
18/06/19	5	Unknown	Unknown	1	Bog and grassland moorland	3	09:30	Flying and circling	30-50m	-	70	-	-	-	-
18/06/19	4	Male	Adult	2	Clear fell and 1 st rotation forestry	1	10:29	Displaying and circling	100-120m	-	-	-	-	47	-
19/09/19	4	Unknown	Unknown	3A	Bog and cutover bog	10	18:11	Flying	20-100m	-	-	17	163	-	-
				3B		4	19:24		>200m	-	-	-	-	-	46
19/09/19	5	Unknown	Unknown	4	Bog and grassland moorland	9	19:25	Flying and circling	10-15m	-	100	-	-	-	-
Snipe Winter 2019/2020															
21/01/20	1	Unknown	Adults	1A	Bog	1	09.35	Ground, flying	0-2m	1	4	-	-	-	-
				1B	Bog, 2 nd rotation forestry	2	09.36	Ground, flying	0-50m	1	6	12	-	-	-
				1C	Bog, 1 st and 2 nd rotation forestry	1	12.35	Ground, flying	0-20m	1	6	-	-	-	-
18/02/20	1	Unknown	Adults	2A	Bog	1	11.15	Flying	0-10m	-	5	-	-	-	-
				2B		1	11.15	Flying	1-2m	-	3	-	-	-	-
				2C		1	11.16	Flying	0-10m	-	4	-	-	-	-
Snipe Breeding 2020															
22/05/20	5	Unknown	Unknown	1A, 1B	Bog	2	10:01	Flying	10-15m	-	35	-	-	-	-
30/09/20	6	Unknown	Unknown	2	Bog	1	09:30	Flying	1m	-	25	-	-	-	-

Snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Snipe Winter 2020/2021															
27/10/20	1	Unknown	Unknown	1	Bog	1	09:50	Flying	1m	-	3	-	-	-	-
25/11/20	6	Unknown	Unknown	2	Bog, heather moorland	1	09:10	Flying	1m	-	10	-	-	-	-
21/01/21	6	Unknown	Unknown	3	Bog, 1 st rotation forestry	1	14:20	Flying	2m	-	5	-	-	-	-
25/01/21	3	Unknown	Unknown	4	2nd rotation forestry	1	14:10	On ground Flying	n/a 0-20m	360	90	-	-	-	-
19/02/21	1	Unknown	Unknown	5	Bog	1	11:05	Flying	50m	-	-	50	-	-	-
24/02/21 *Incidental	6	Unknown	Unknown	6	Bog	1	09:20	Flying	4m	-	40	-	-	-	-
Snipe Breeding 2021															
21/04/21	5	Unknown	Unknown	1	Bog	3	20.17	Flying	100m	-	-	-	6	-	-
24/05/21 *Incidental	4	Unknown	Unknown	-	Bog	1	09.06- 09.15	Heard chipping	-	-	-	-	-	-	-
26/05/21 *Incidental	1	Unknown	Unknown	-	Bog	1	-	Heard calling south of VP4	-	-	-	-	-	-	-
14/06/21 *Incidental	4	Unknown	Unknown	-	Track	1	-	Flushed on way to VP4	-	-	-	-	-	-	-
19/07/21 *Incidental	3	Unknown	Unknown	-	Bog	1	-	Heard chipping south of VP3	-	-	-	-	-	-	-
20/09/21	4	Unknown	Unknown	2	Bog	2	09.20	Flying	5-15m	-	23	-	-	-	-
Snipe Winter 2021/2022															
12/10/21	4	Unknown	Unknown	1	Bog	3	11.51	Flying	100-180m	-	-	-	-	120	-

Snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
14/10/21	6	Unknown	Unknown	2	Bog	17	15.22	Flying	0-10m	-	29	-	-	-	-
14/10/21	6	Unknown	Unknown	3	Bog	15	15.22	Flying	0-12m	-	5	-	-	-	-
14/10/21	6	Unknown	Unknown	4	1 st Rotation Forest/Bog	50	15.23	Flying	2-5m	-	10	-	-	-	-
14/10/21	6	Unknown	Unknown	5	1 st Rotation Forest/Bog	50	15.24	Flying	2-10m	-	15	-	-	-	-
14/10/21	6	Unknown	Unknown	6	Bog	5	15.30	Flying	0-1m	-	5	-	-	-	-
14/10/21	6	Unknown	Unknown	7	1 st & 2 nd Rotation Forest/Ground/Bog	6	15.39	Flying	0-180m	-	5	10	50	50	-
14/10/21	6	Unknown	Unknown	8	Bog	15	15.47	Flying	0-10	-	27	-	-	-	-
15/10/21	7	Unknown	Unknown	9	1 st & 2 nd Rotation Forest/Thicket/Bog	40	10.35	Flying	>180m	-	-	-	-	-	80
15/10/21	7	Unknown	Unknown	10	1 st & 2 nd Rotation Forest/Thicket	16	12.17	Flying	3-6m	-	10	-	-	-	-
10/12/21	6	Unknown	Unknown	11	Bog	1	10.50	Flying	0-2m	-	10	-	-	-	-
10/12/21 *Incidental	7	Unknown	Unknown	12	Bog	1	10.54	Flying	0.5m	-	8	-	-	-	-
14/01/22 *Incidental	-	Unknown	Unknown	-	Flushed on way to VP6	2	-	Flying	-	-	-	-	-	-	-
14/01/22	6	Unknown	Unknown	13	Bog	1	12.53	Flying	1m	-	9	-	-	-	-
Snipe Breeding 2022															
05/05/22	5	Male	Adult	1	Bog	1	08.05	Flying/Displaying	100-180m	-	-	-	-	780	-
05/05/22	5	Male	Adult	2	Bog	1	08.05	Flying/Displaying	100-180m	-	-	-	-	780	-

Snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
01/06/22 *Incidental	5	Unknown	Unknown	-	-	1	16.46	Heard calling	-	-	-	-	-	-	-
01/06/22 *Incidental	4	Unknown	Unknown	-	-	1	20.54	Heard calling	-	-	-	-	-	-	-
01/06/22 *Incidental	4	Unknown	Unknown	-	-	1	22.33 22.43	Heard chipping Heard drumming	-	-	-	-	-	-	-
01/07/22	4	Unknown	Unknown	3	Bog	1	07.54 07.57	Heard chipping Flying	0-18m	-	7	-	-	-	-
02/09/22	5	Unknown	Unknown	4	Bog	1	10.05	Flying	0-20m 20-50m	-	19	-	-	-	-
Snipe Winter 2022/2023															
04/10/22	4	Unknown	Adult	1	Bog	1	17:04	Flying	30-0m	-	2	13	-	-	-
06/10/22	6	Unknown	Unknown	2	Bog	32	12:49	Flying	0-40m	-	35	35	-	-	-
24/10/22	6	Unknown	Adult	3	Bog	1	16:33	Flying	<1m	-	10	-	-	-	-
09/11/22	6	Unknown	Unknown	4	Bog/1 st Rotation forestry	1	14:10	Flying	0-50m	-	11	22	-	-	-
16/11/22	1	Unknown	Unknown	5	Bog	1	11:30	Flying	1-2m	-	7	-	-	-	-
01/12/22	4	Unknown	Unknown	6	Bog	1	09:28	Flying	0.5m	-	6	-	-	-	-
06/12/22	1	Unknown	Adult	7	Bog	1	07:45	Flying	0-<1m	-	9	-	-	-	-
07/12/22 *Incidental	7	Unknown	Unknown	-	-	1	07:51	Heard calling	-	-	-	-	-	-	-
07/12/22 *Incidental	7	Unknown	Unknown	-	-	1	07:54	Heard calling	-	-	-	-	-	-	-
08/12/22	7	Unknown	Adult	8	Bog/1 st and 2 nd Rotation forestry	1	12:13	Flying	0-180m	-	12	11	52	12	-

Snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
13/12/22	2	Unknown	Unknown	9	1 st Rotation forestry/Scrub	3	07:45	Flying	1-2m	-	4	-	-	-	-
13/12/22	6	Unknown	Unknown	10	1 st Rotation forestry	1	11:18	Flying	2-4m	-	8	-	-	-	-
10/01/23 *Incidental	1	Unknown	Adult	11	1 st and 2 nd Rotation forestry	1	10:00	Flying	1	-	13	-	-	-	-
10/01/23 *Incidental	1	Unknown	Adult	12	1 st and 2 nd Rotation forestry	1	10:19	Flying	1	-	14	-	-	-	-
10/01/23 *Incidental	6	Unknown	Adult	13	Bog	1	15:01	Flying	1	-	4	-	-	-	-

Whooper swan

Whooper swan															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Whooper swan Winter 2021/2022															
15/10/21	7	Unknown	Unknown	1	Bog	8	11.30	Flying	>180m	-	-	-	-	-	67
15/10/21	7	Unknown	Unknown	2	Clear Fell/Thicket /1 st & 2 nd Rotation Forest	6	12.17	Flying	>180m	-	-	-	-	-	200
15/10/21	2	Unknown	Unknown	3	Bog/Forest/Clear Fell	6	12.17	Flying	120m	-	-	-	-	105	-
Whooper swan Winter 2022/2023															
06/12/22	1	Unknown	Unknown	1	1 st and 2 nd Rotation forestry/Bog/River	8	10:20	Flying	5- >180m	-	10	10	15	70	325

Great Northern Diver

Great Northern Diver															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Great Northern diver Winter 2022/2023															
03/11/22	5	Unknown	Unknown	1	Bog	2	10:48	Flying	300m	-	-	-	-	-	10

Grey heron

Grey heron															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Grey heron Breeding 2019															
20/09/19	4	Unknown	Unknown	1	Grassland moorland and stream	1	10:05	Flying and on the ground	0-10m	-	15	-	-	-	-
Grey heron Winter 2019/2020															
21/01/20	1	Unknown	Adult	1	1 st rotation forestry	1	11.27	Flying	50-100m	-	-	-	9	-	-
Grey heron Breeding 2022															
05/05/22	5	Unknown	Adult	1	River/Scrub/Bog	1	09.04	Flying	40-20m 20-0m	- -	4		83 -	- -	- -
01/07/22	4	Unknown	Adult	2	River/Bog	1	09.21	Flying	5-0m	-	72	-	-	-	-
01/07/22	5	Unknown	Adult	3	River/Bog	1	11.59	Flying	6m	-	65	-	-	-	-
01/07/22	5	Unknown	Adult	4	River/Bog/1 st rotation forestry	1	13.28	Flying	8-20m 20-40m	- -	24		- 23	- -	- -
Grey heron Winter 2022/2023															
17/02/23	5	Unknown	Adult	1	1 st Rotation forestry	1	12:08	Flying	15m	-	5	-	-	-	-

Great black-backed gull

Great black-backed gull															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Great black-backed gull Breeding 2019															
16/07/19	7	Unknown	Adult	1	Thicket and heather moorland	1	11:43	Flying and circling	30->200m	-	40	30	30	120	
Great black-backed gull Winter 2020/2021															
15/02/21	4	Unknown	Adult	1	2 nd rotation forestry	2	10:56	Flying	0-20m	-	180	-	-	-	-
Great black-backed gull Breeding 2021															
24/05/21	5	Unknown	Adult	1	Bog	1	10.30	Flying	5m	-	34	-	-	-	-
Great black-backed gull Winter 2021/2022															
09/03/22	5	Unknown	Juvenile	1	Bog/1 st and 2 nd rotation forestry	1	12.42	Flying	2-20m	-	278	-	-	-	-
Great black-backed gull Breeding 2022															
01/04/22	6	Unknown	Adult	1	Bog /1 st & 2 nd Rotation Forest/Thicket/Clear fell	2	16.03	Flying	15-20m	-	40	-	-	-	-
									20-50m	-	-	40	-	-	-
									50-100m	-	-	-	40	-	-
									100-180m	-	-	-	-	60	-
									180-200m	-	-	-	-	-	60
05/07/22	5	Unknown	Adult	2	Bog/River/Scrub/1 st rotation forestry	1	17.04	Flying	4-20m	-	124	-	-	-	-

Lesser black-backed gull

Lesser black-backed gull															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Lesser black-backed gull Breeding 2019															
18/06/19	4	Unknown	Adults	1A	1 st rotation forestry, clearfell	2	09:59	Flying	30-100m	-	5		15	-	-
				1B	1 st rotation forestry, clear fell, heather moorland and bog				50-200m				32	78	39
20/06/19	7	Unknown	Adult	2	Heather moorland, 1 st rotation forestry and 2 nd rotation forestry	1	17:24	Flying	0-100m	-	12	12	22	-	-

Mallard

Mallard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Mallard Breeding 2019															
17/04/19	5	Male and Female	Adult	1	1st rotation forestry	2	12:30	Flying	0-30m	-	21	21	-	-	-
18/06/19	5	Male and Female	Adult	2	Rough grassland, bog, grassland moorland, scrub and stream	2	12:40	Flying	5-10m	-	10	-	-	-	-
Mallard Winter 2020/2021															

Mallard															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
15/02/21 *Incidental	4	Male and Female	Adult	1	Bog	2	09:10	Flying	12m	-	60	-	-	-	-
Mallard Winter 2021/22															
15/10/21 *Incidental	1	Unknown	Unknown	1	1 st Rotation Forest/Scrub	2	07.01	Flying	4m	-	8	-	-	-	-
09/03/22	5	Male	Adult	2	Bog	1	11:46	Flying	2-12m	-	30	-	-	-	-
Mallard Winter 2022/2023															
26/03/23	1	Male	Unknown	1	1 st and 2 nd Rotation forestry	1	09:46	Flying	60	-	-	-	120	-	-

Red grouse

Red grouse															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Red grouse Breeding 2020															
07/05/20	5	Unknown	Adult	1	Bog	1	09:06	Flying	1m	-	8	-	-	-	-
27/08/20 *Incidental	4	Unknown	Unknown	2	On ground	1	12:50	Calling	-	10	-	-	-	-	-
Red grouse Breeding 2021															
26/04/21 *Incidental	7	Unknown	Unknown	-	-	-	-	Droppings	-	-	-	-	-	-	-
24/05/21 *Incidental	4	Unknown	Unknown	-	Bog	1	08.24	Heard calling	-	-	-	-	-	-	-
21/07/21 *Incidental	5	Unknown	Unknown	-	Bog	1	-	Heard calling	-	-	-	-	-	-	-

Red grouse															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
21/07/21 *Incidental	4	Unknown	Unknown	-	Track	1	-	Observed on track on way to VP4	-	-	-	-	-	-	-
Red grouse Winter 2021/2022															
10/12/21 *Incidental	7	Unknown	Unknown	1	1 st Rotation Forest/Bog	2	12.02	Flying	1-3m	-	11	-	-	-	-
11/01/22 *Incidental	4	Male	Adult	-	-	-	10.09 10.20 10.21	Heard singing/Not seen	-	-	-	-	-	-	-
11/01/22 *Incidental	7	Unknown	Unknown	-	-	1	12.17	Heard calling/Not seen	-	-	-	-	-	-	-
13/01/22 *Incidental	4	Unknown	Unknown	-	-	1	17.09	Heard calling/Not seen	-	-	-	-	-	-	-
14/01/22 *Incidental	7	Unknown	Unknown	-	-	-	-	Droppings observed	-	-	-	-	-	-	-
Red grouse Breeding 2022															
14/04/22 *Incidental	7	Male	Adult	-	-	1	12.29	Heard calling	-	-	-	-	-	-	-
05/05/22	5	Unknown	Adult	1	Bog	1	08.58	Flying	<1m	-	14	-	-	-	-
01/06/22 *Incidental	4	Unknown	Unknown	-	-	1	22.30	Heard singing	-	-	-	-	-	-	-
Red grouse Winter 2022/2023															
04/10/22	5	M&F	Adult	1,2	Bog	2	13:17	Flying	<1m	1	(M) 23 (F)5	-	-	-	-
05/10/22	5	Male	Adult	3	Bog	1	16:19	Flying	<1m	-	46	-	-	-	-
05/10/22	5	Female	Adult	4	Bog	1	16:20	Flying	<1m	-	8	-	-	-	-

Red grouse															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
07/12/22 *Incidental	7	Male	Adult	-	-	2	07:59	Heard calling	-	-	-	-	-	-	-
07/12/22 *Incidental	7	Male	Adult	-	-	1	08:01	Heard calling	-	-	-	-	-	-	-
07/12/22 *Incidental	7	Male	Adult	-	-	1	08:13	Heard calling	-	-	-	-	-	-	-
15/02/23	7	Unknown	Adult	5	Bog	3	10:37	Flying	<1m	-	35	-	-	-	-

Teal

Teal															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Teal Breeding 2021															
14/09/21 *Incidental	3	Unknown	Unknown	1	Drain, 1 st rotation forestry	2	12:55	Perched, flying	0-10m	-	3	-	-	-	-
Teal Winter 2022/2023															
03/11/22	5	Male	Adult	1	Pond	1	09:00	Loafing	0	-	-	-	-	-	-

Cormorant

Cormorant															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Cormorant Winter 2021/2022															

Cormorant															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
07/01/22	3	Unknown	Unknown	1	1 st & 2 nd Rotation Forest/Clear fell	1	14.42	Flying	>180m	-	-	-	-	-	40
Cormorant Breeding 2022															
10/08/22	5	Unknown	Adult	1	Bog/Rough grassland	1	18.48	Flying	300	-	-	-	-	-	101

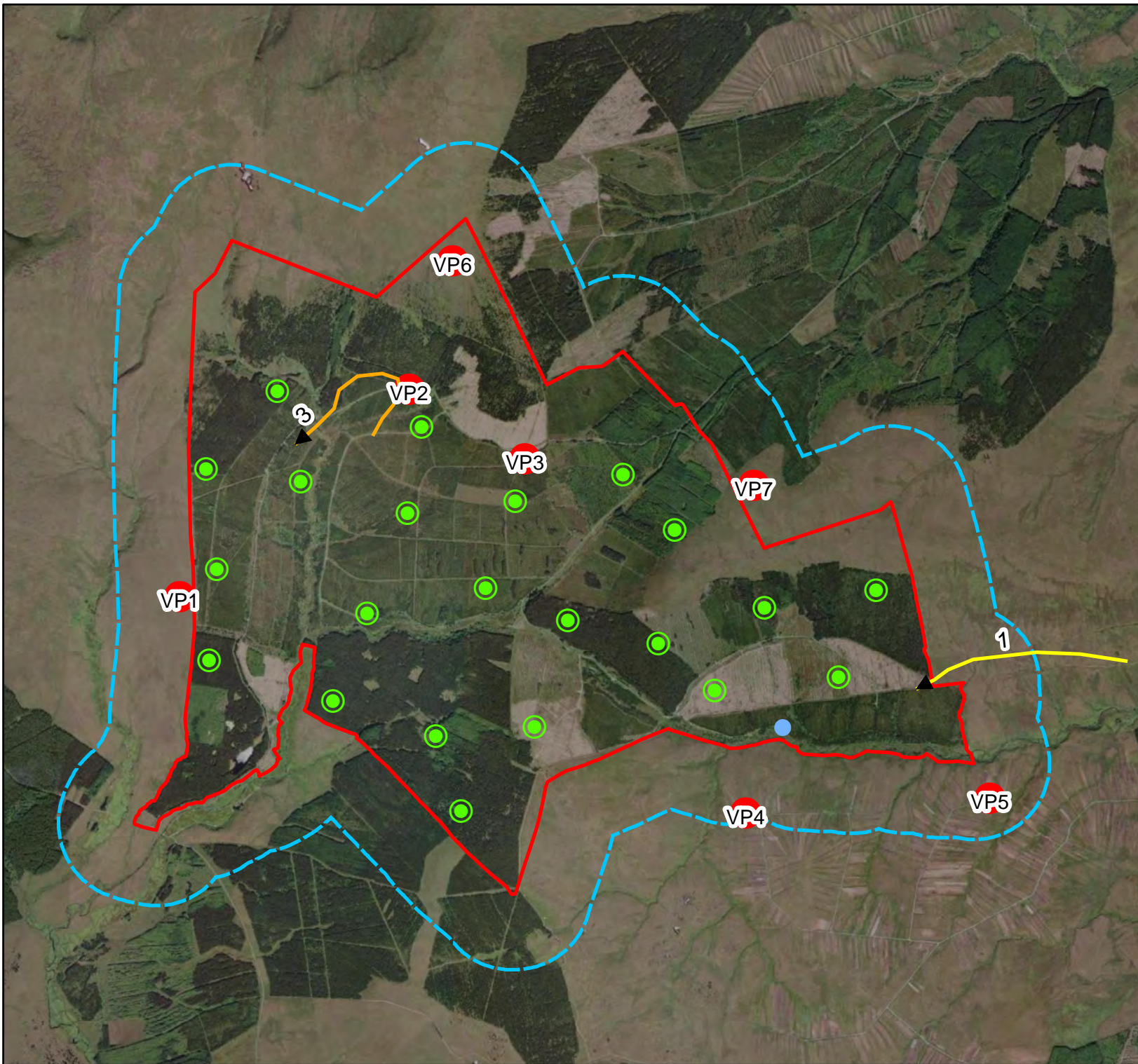
Jack snipe

Jack snipe															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Jack snipe Winter 2021/2022															
13/01/22 *Incidental	4	Unknown	Unknown	1	On the ground/Bog	1	17.35	On ground, flying	N/a 0-6m	60	5	-	-	-	-
13/01/22 *Incidental	4	Unknown	Unknown	2	On the ground/Bog	1	17.39	On ground, Flying	N/a 0-5m	3	5				
Jack snipe Winter 2022/2023															
02/11/22 *Incidental	3	Unknown	Adults	1	Rough grassland	1	13:36	Flying	0-2m	-	2	-	-	-	-

Iceland Gull

Iceland Gull															
Date	VP	Sex	Age	Map Ref No.	Habitat	No. of Birds	Time of Obs.	Activity	Flight Height (m)	Time (sec) spent in Height Category					
										Non-flight	0-20m	20-50m	50-100m	100-180m	>180m
Iceland gull Winter 2020/2021															
22/03/21	6	Unknown	2 nd CY	1	Bog, 1 st rotation forestry	1	12.55	Flying	7m	-	18	-	-	-	-

Appendix 5
Flight Paths



Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Buzzard Flight Path

- ▶ 1, 23/05/19
- ▶ 3, 17/09/19
- ▶ 4, 20/09/19

Buzzard Activity

- 2, 23/05/19

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0 0.75 1.5 km

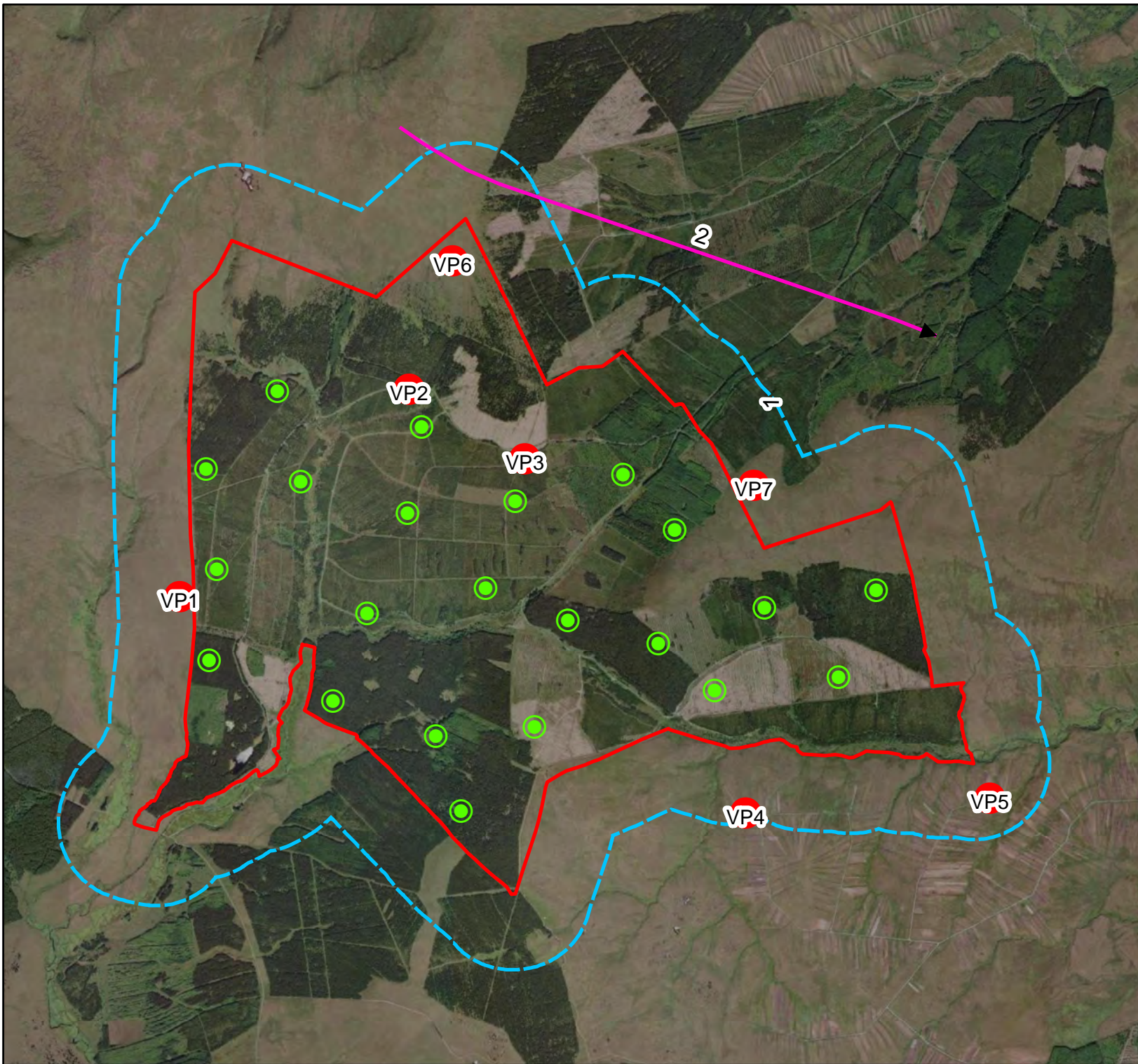
Project Title: 21424 -
Glenora WF - 2019 Breeding bird surveys

Client: SSE Renewables

Drawing Title:
Map 1-1 Buzzard

Drawn: VH	Checked: DoB
Date: 08/06/2023	Scale (A4): 1:35,000





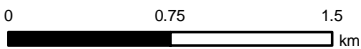
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Golden Plover Flight Path

- ▶ 1, 16/04/19
- ▶ 2, 18/09/19

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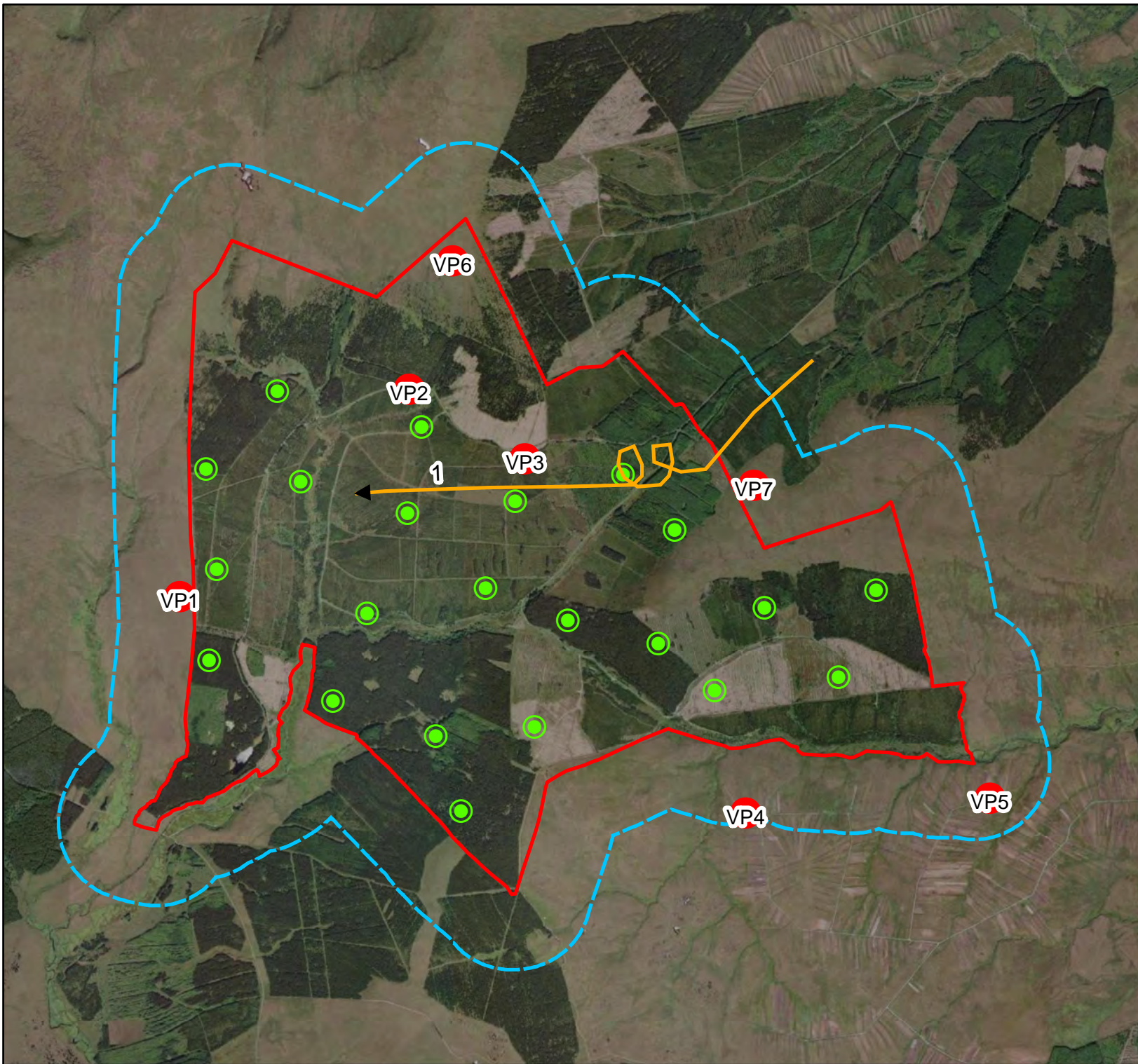
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Drawing Title:
Map 2-1 Golden Plover

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





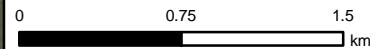
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Great Black-backed Gull Flight Path

➔ 1, 16/07/19

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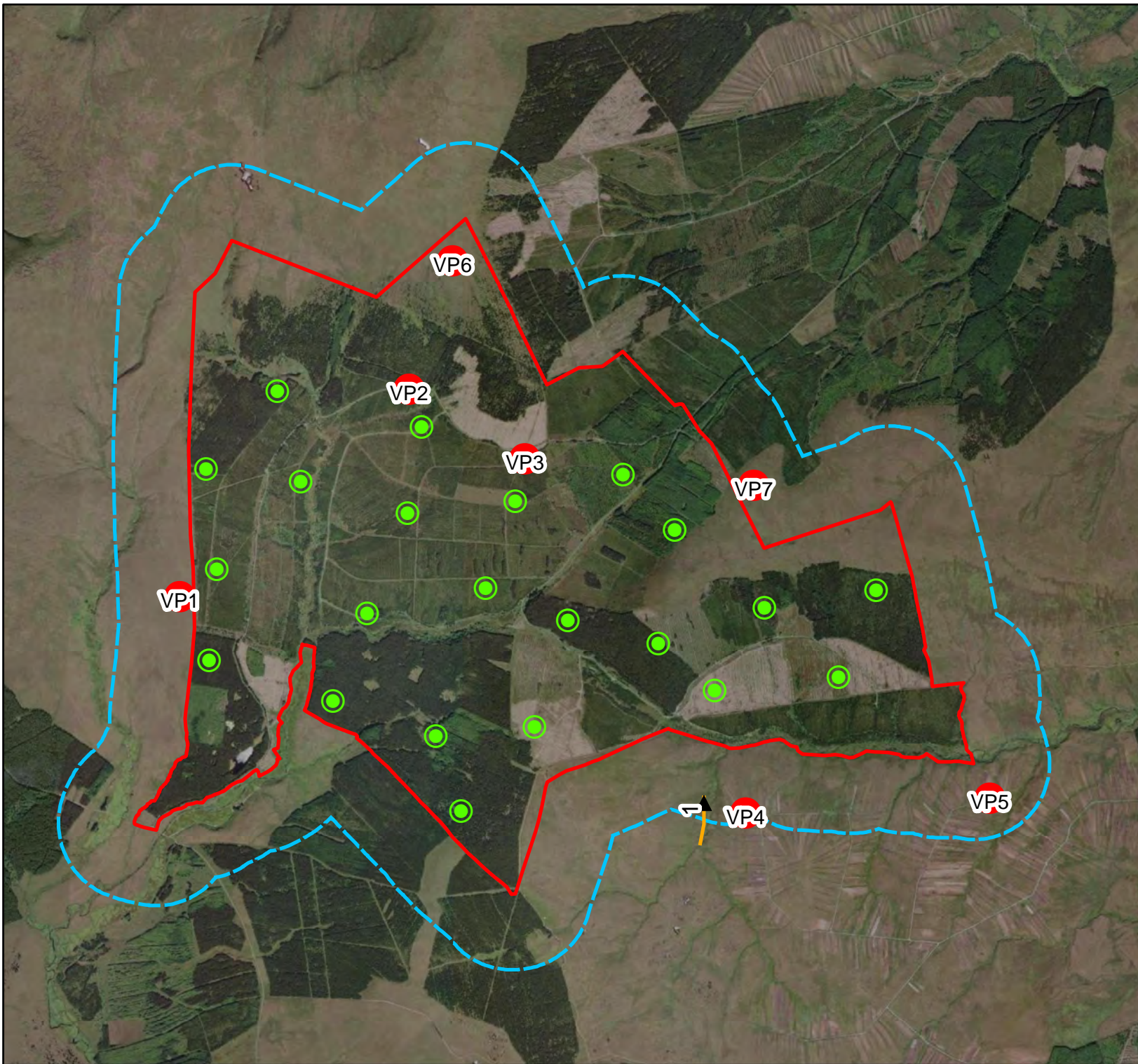
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Drawing Title:
Map 3-1 Great Black-backed Gull

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





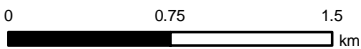
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Grey Heron Flight Path

➔ 1, 20/09/19

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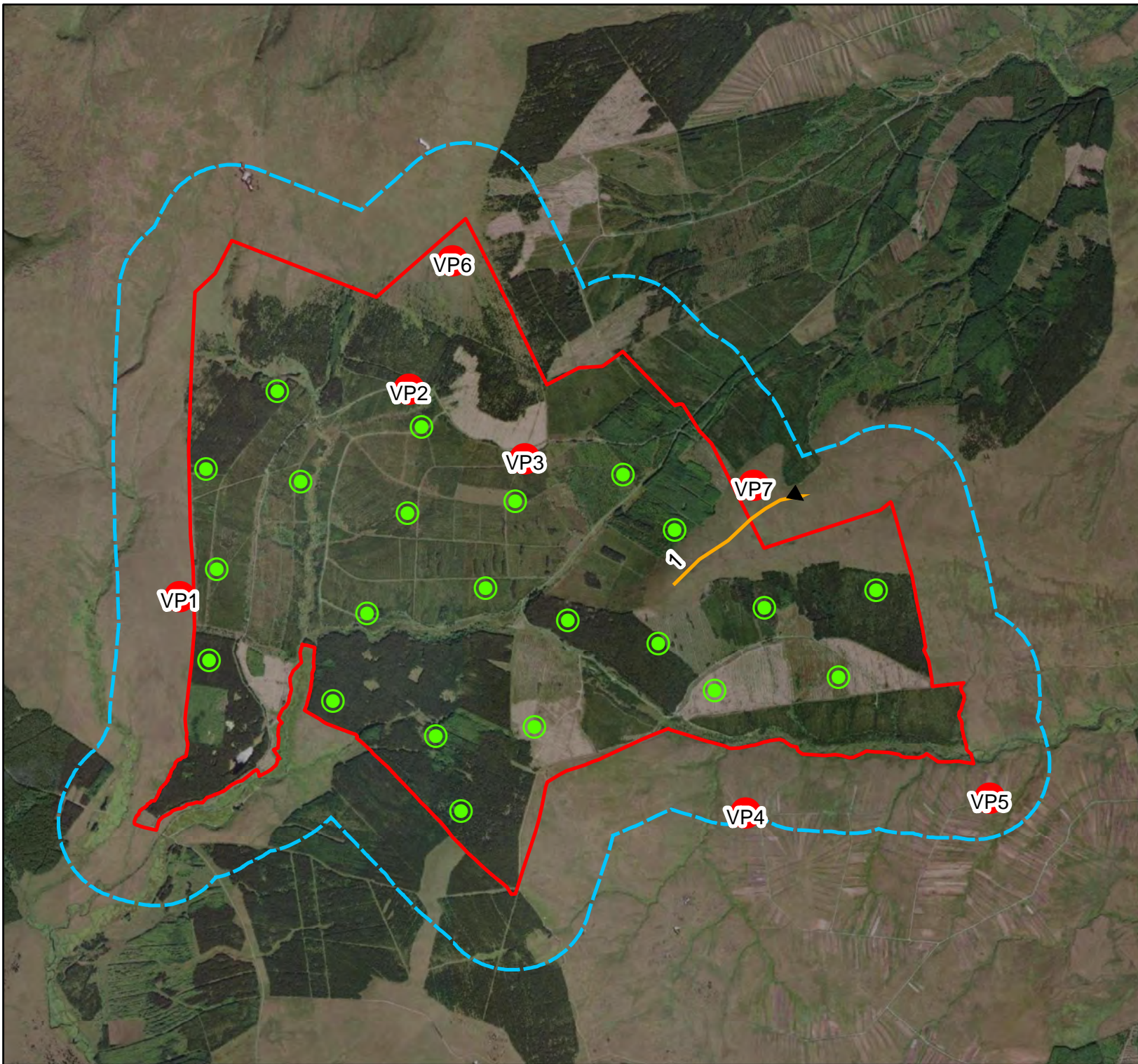
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Drawing Title:
Map 4-1 Grey Heron

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





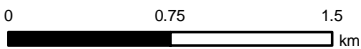
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Hen Harrier Flight Path

→ 1, 16/04/19

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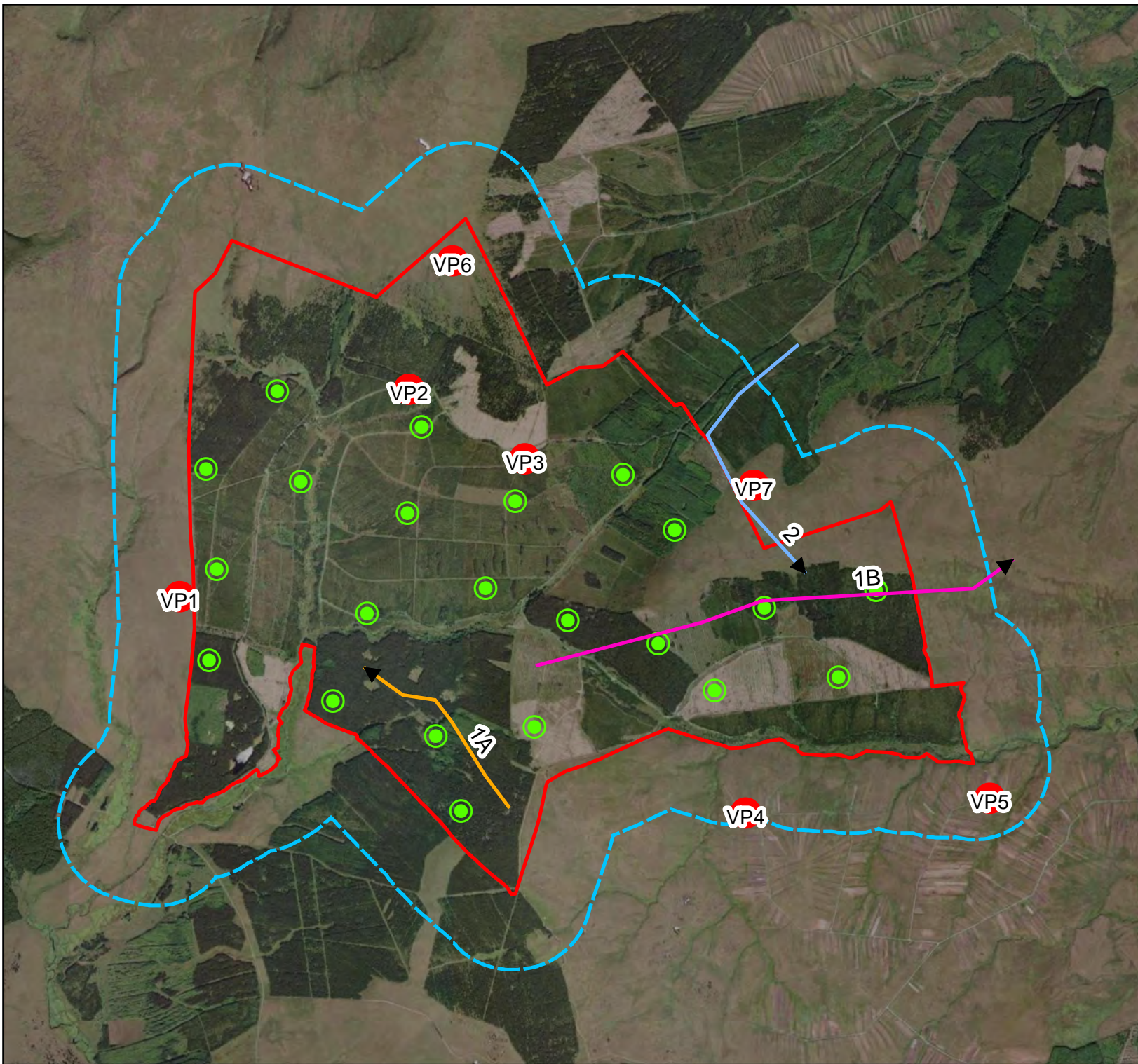
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Drawing Title:
Map 5-1 Hen Harrier

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





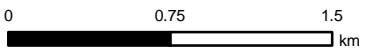
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Lesser Black-backed Gull Flight Path

- ▶ 1A, 18/06/19
- ▶ 1B, 18/06/19
- ▶ 2, 20/06/19

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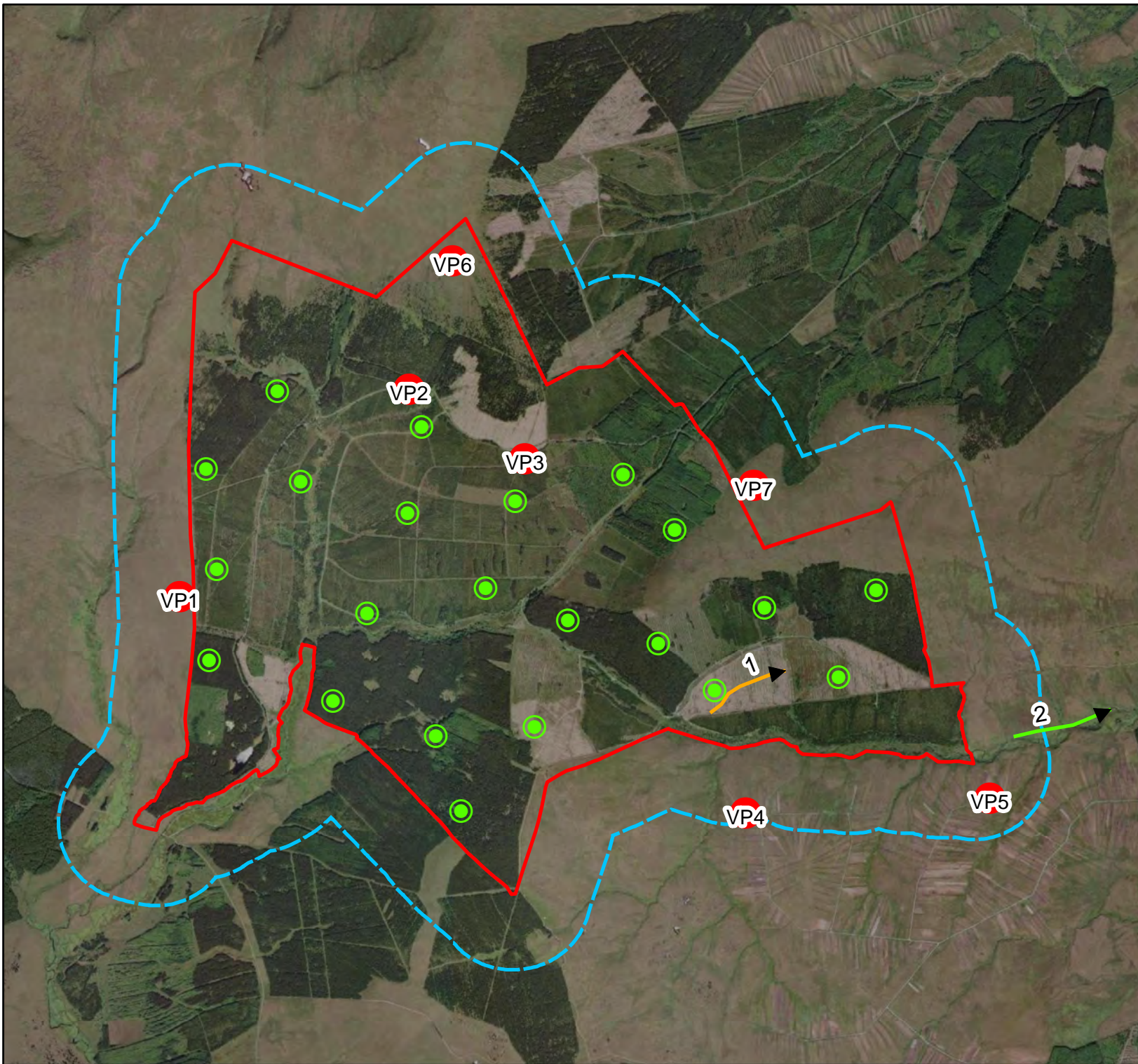
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Drawing Title:
Map 6-1 Lesser Black-backed Gull

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





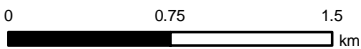
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Mallard Flight Path

- 1, 17/04/19
- 2, 18/06/19

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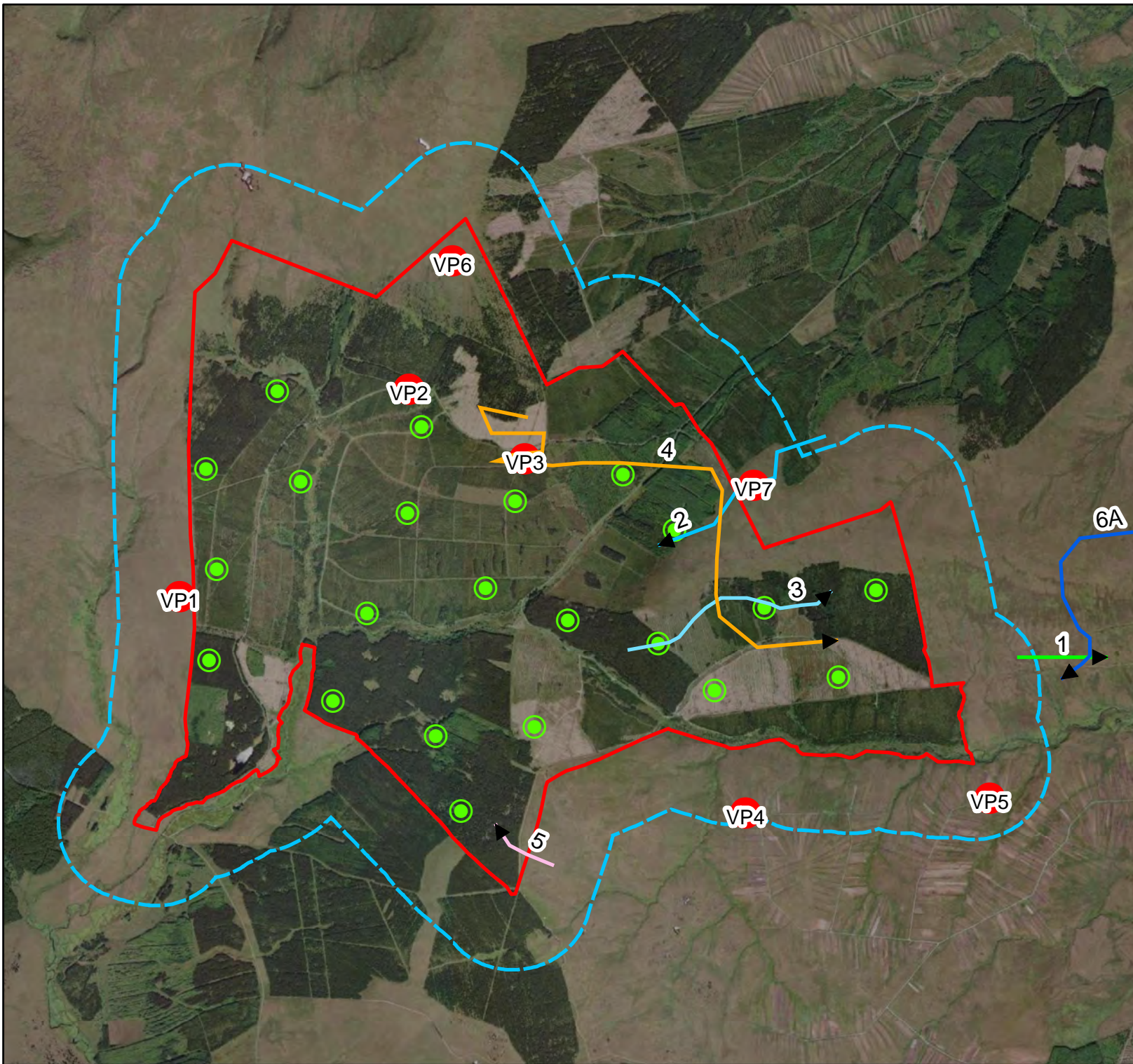
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Drawing Title:
Map 7-1 Mallard

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





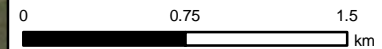
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Kestrel Flight Path

- ▶ 1, 17/04/19
- ▶ 2, 20/06/19
- ▶ 3, 22/08/19
- ▶ 4, 18/09/19
- ▶ 5, 19/09/19
- ▶ 6A, 20/09/19
- ▶ 6B, 20/09/19

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Drawing Title:
Map 8-1 Kestrel

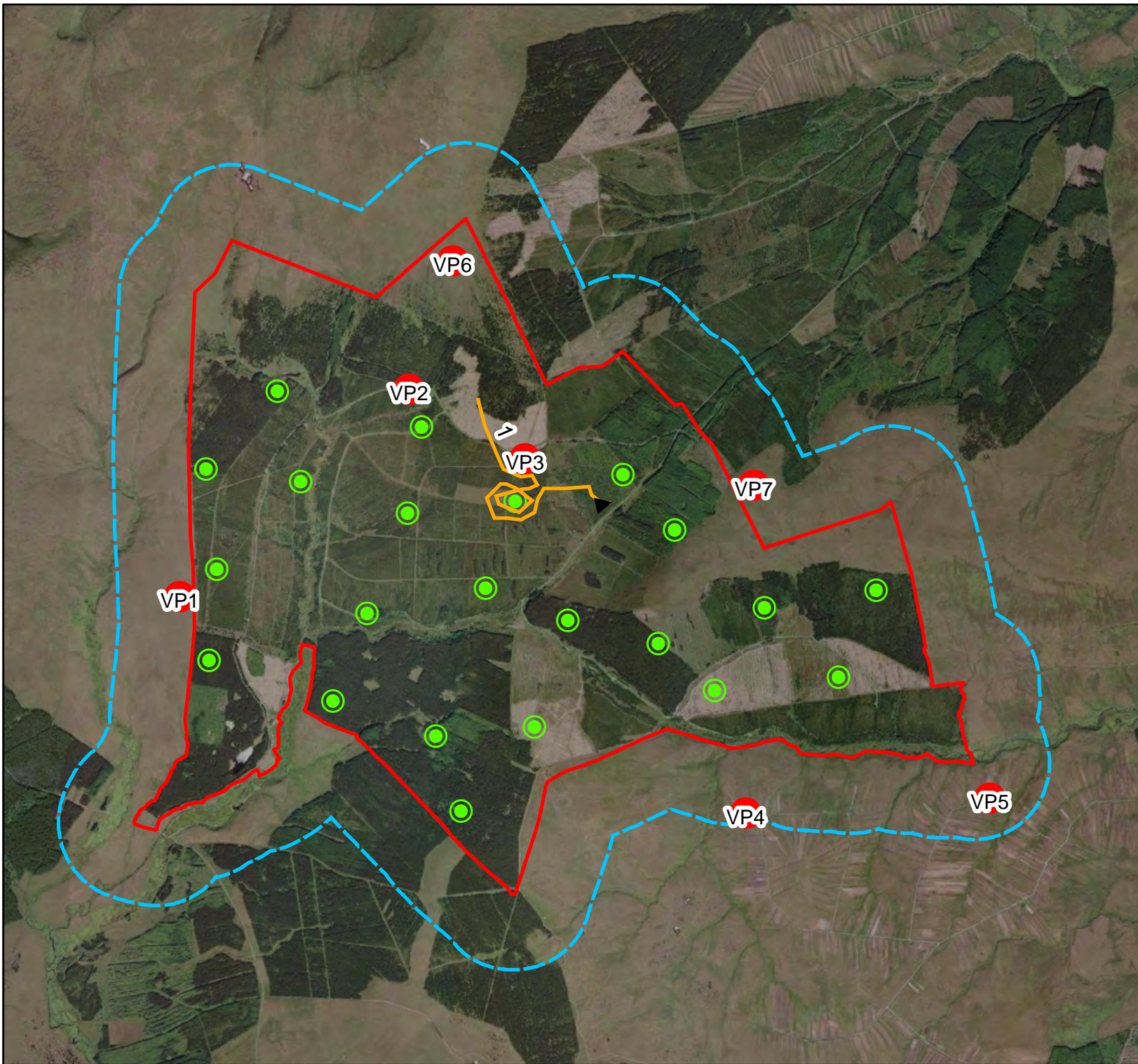
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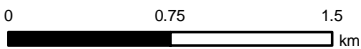
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Peregrine Falcon Flight Path

➔ 1, 17/09/19

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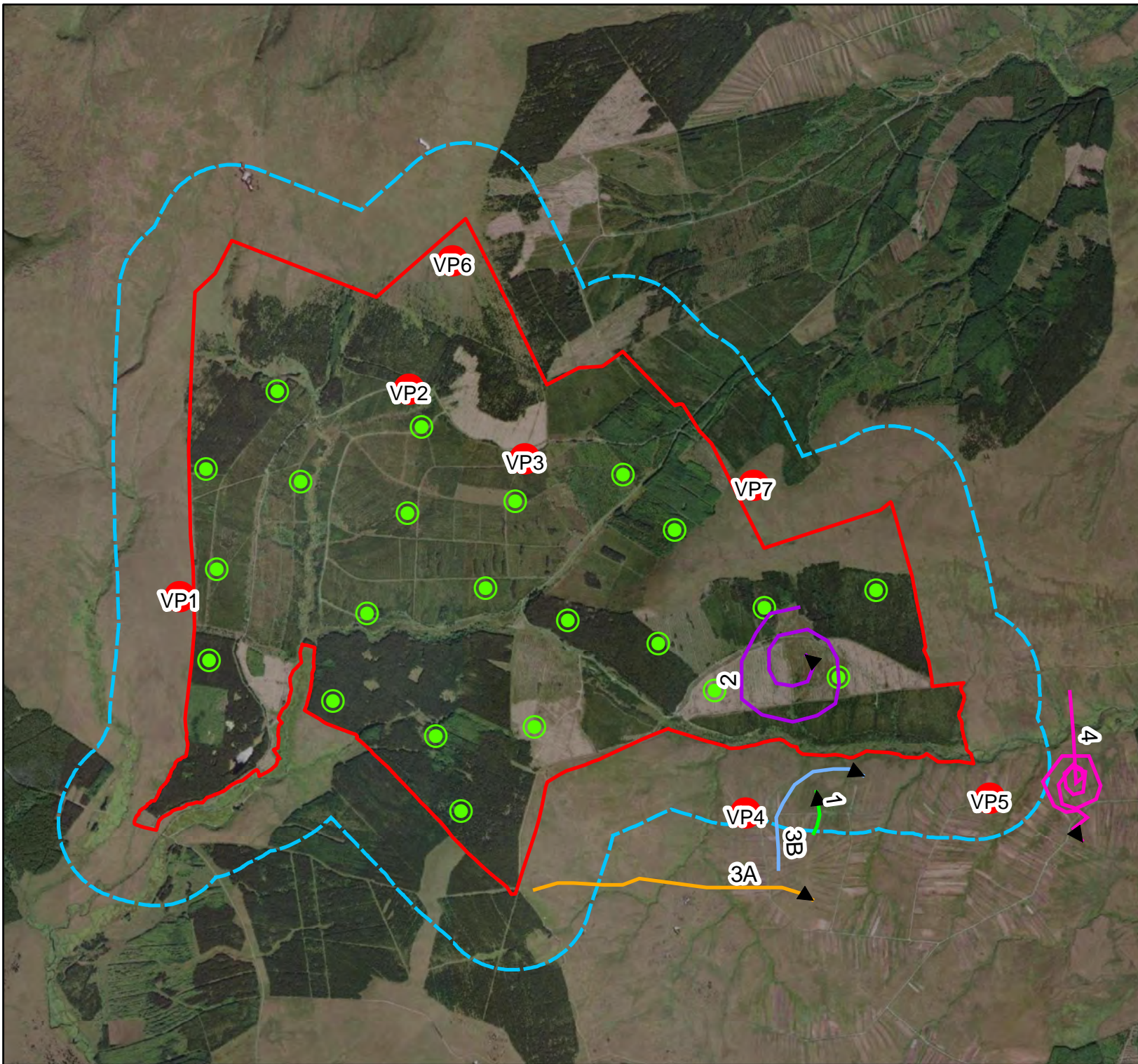
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Drawing Title:
Map 9-1 Peregrine

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe_FP

Snipe Flight Path

- ▶ 1, 18/06/19
- ▶ 2, 18/06/19
- ▶ 3A, 19/09/19
- ▶ 3B, 19/09/19
- ▶ 4, 19/09/19

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0 0.75 1.5 km

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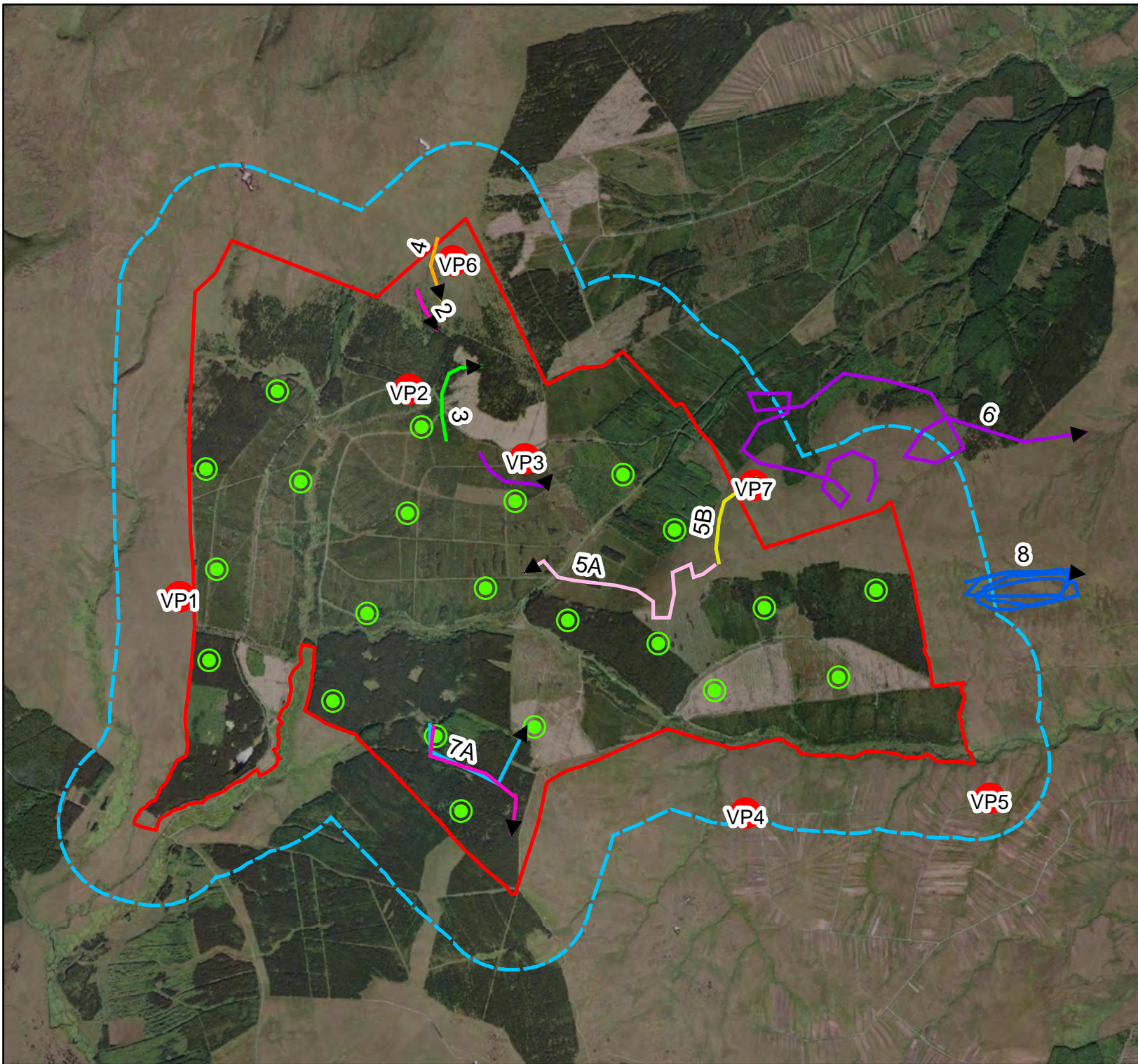
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Drawing Title:
 Map 10-1 Snipe

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Sparrowhawk Flight Path

- 1, 16/04/19
- 2, 18/04/19
- 3, 19/06/19
- 4, 16/07/19
- 5A, 19/08/19
- 5B, 19/08/19
- 6, 18/09/19
- 7A, 19/09/19
- 7B, 19/09/19
- 8, 19/09/19

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0 0.75 1.5 km

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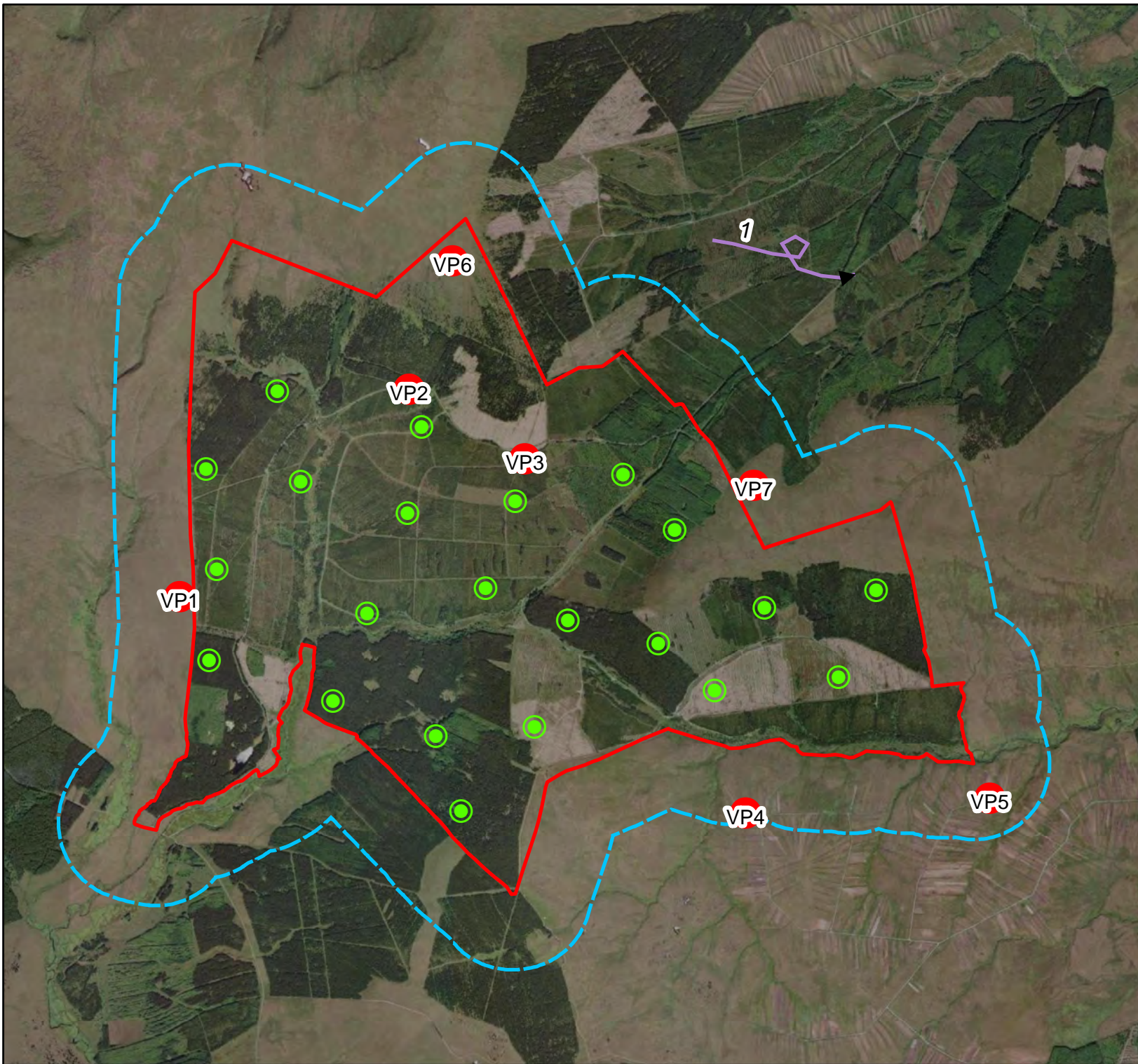
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Drawing Title:
Map 11-1 Sparrowhawk

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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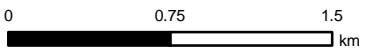
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Buzzard Flight Path

➔ 1, 27/03/20

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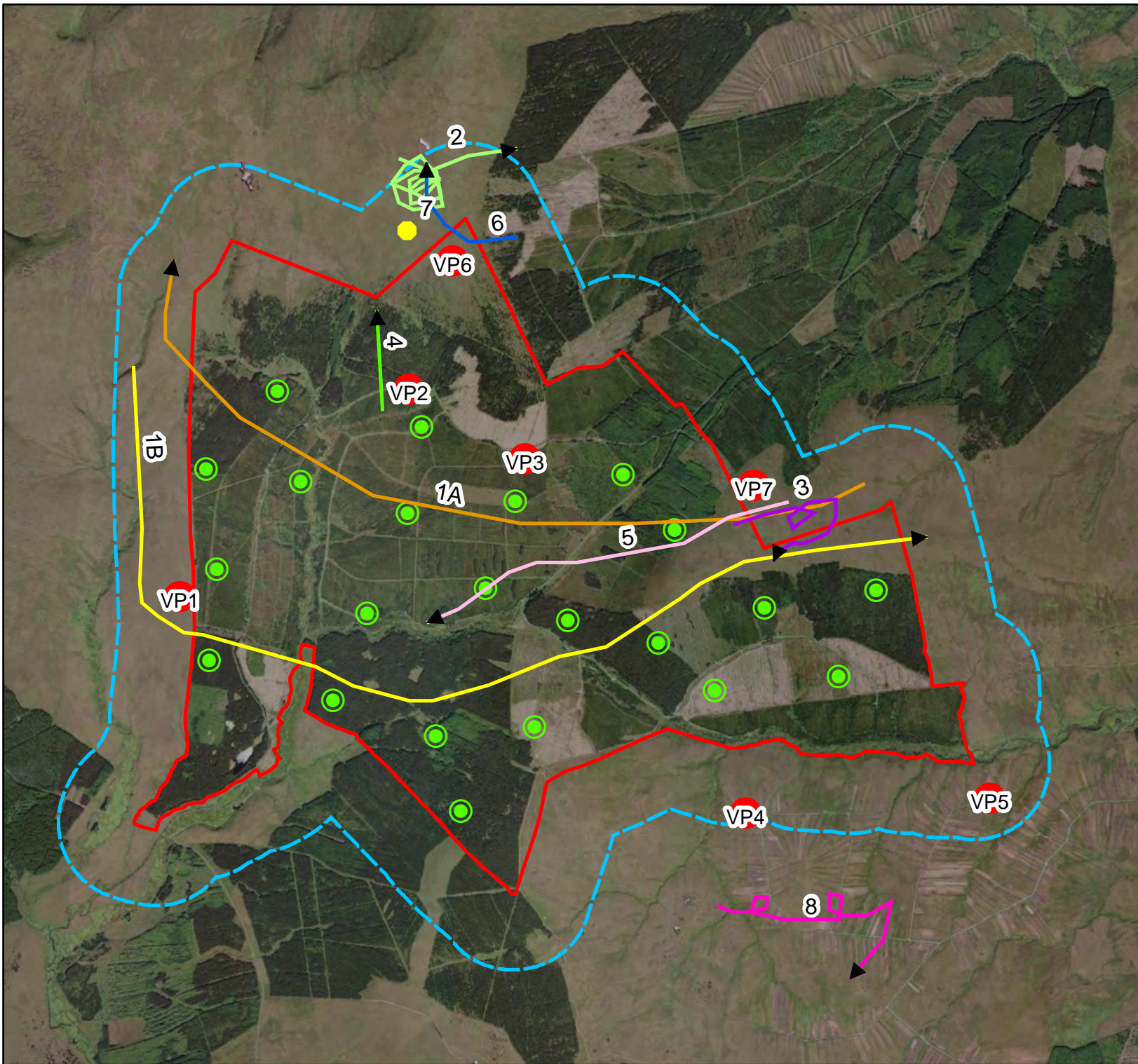
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Drawing Title:
Map 1-1 Buzzard

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations
- Site Boundary

Golden Plover Flight Path

- 1A, 16/10/19
- 1B, 16/10/19
- 2, 16/10/19
- 3, 16/10/19
- 4, 18/10/19
- 5, 18/10/19
- 6, 22/01/20
- 8, 23/03/20

Golden Plover Calling

- 7, 22/01/20 (incidental)

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0 0.75 1.5 km

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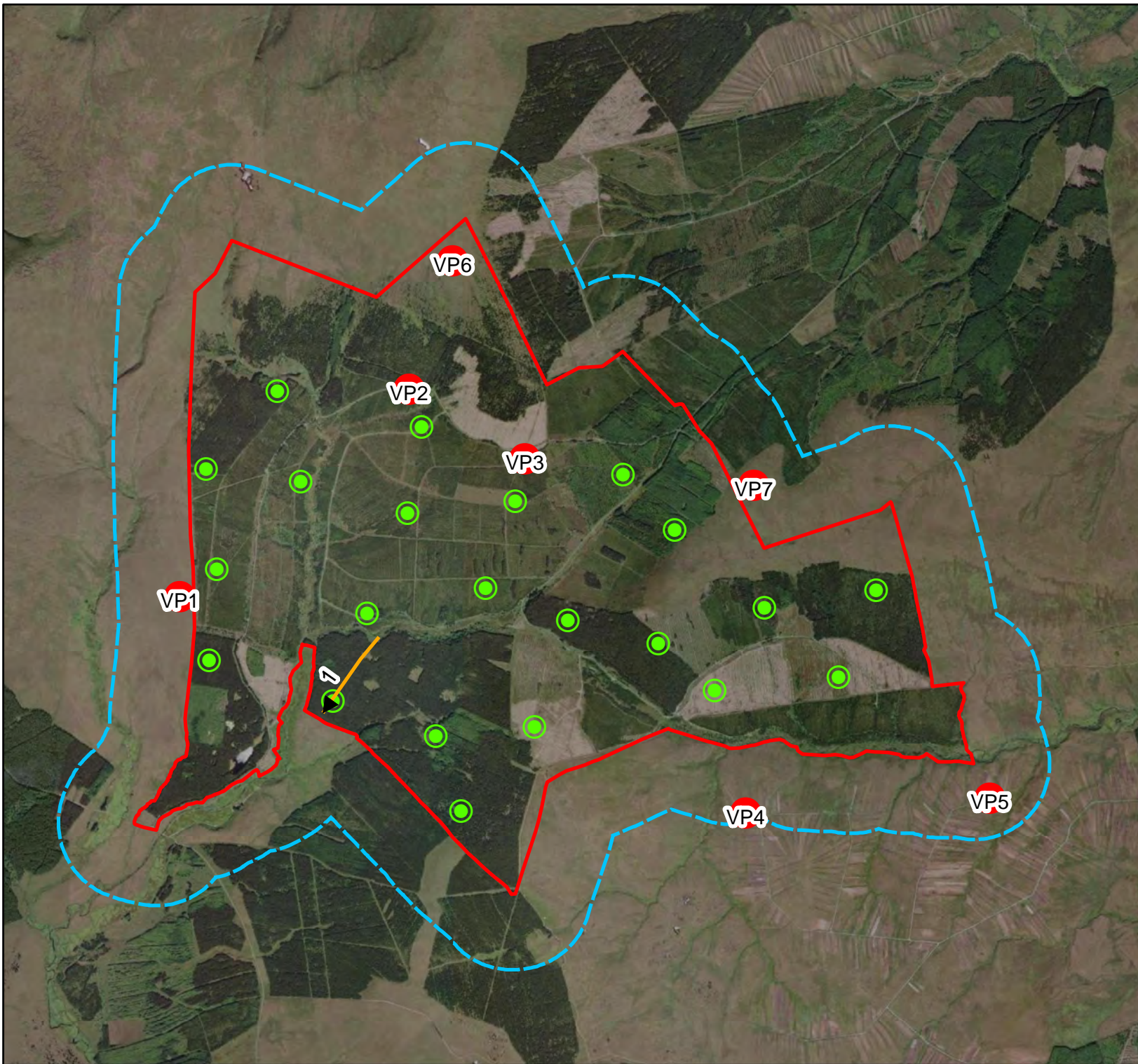
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Drawing Title:
Map 2-1 Golden Plover

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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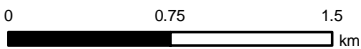
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Grey Heron Flight Path

→ 1, 21/01/20

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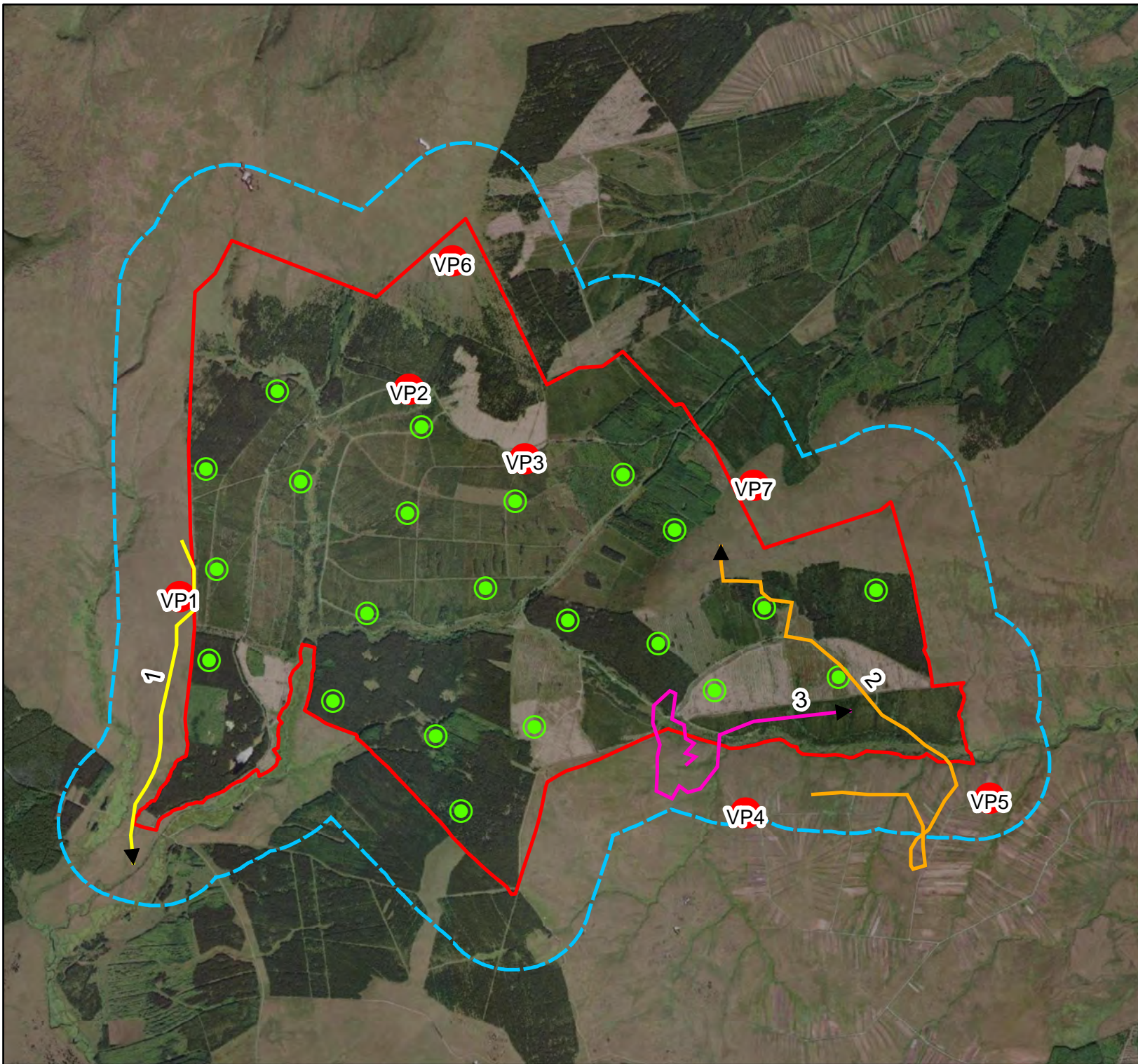
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Drawing Title:
Map 3-1 Grey Heron

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





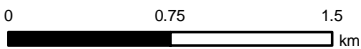
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Hen Harrier Flight Path

- ▶ 1, 15/10/19
- ▶ 2, 23/01/20
- ▶ 3, 23/01/20

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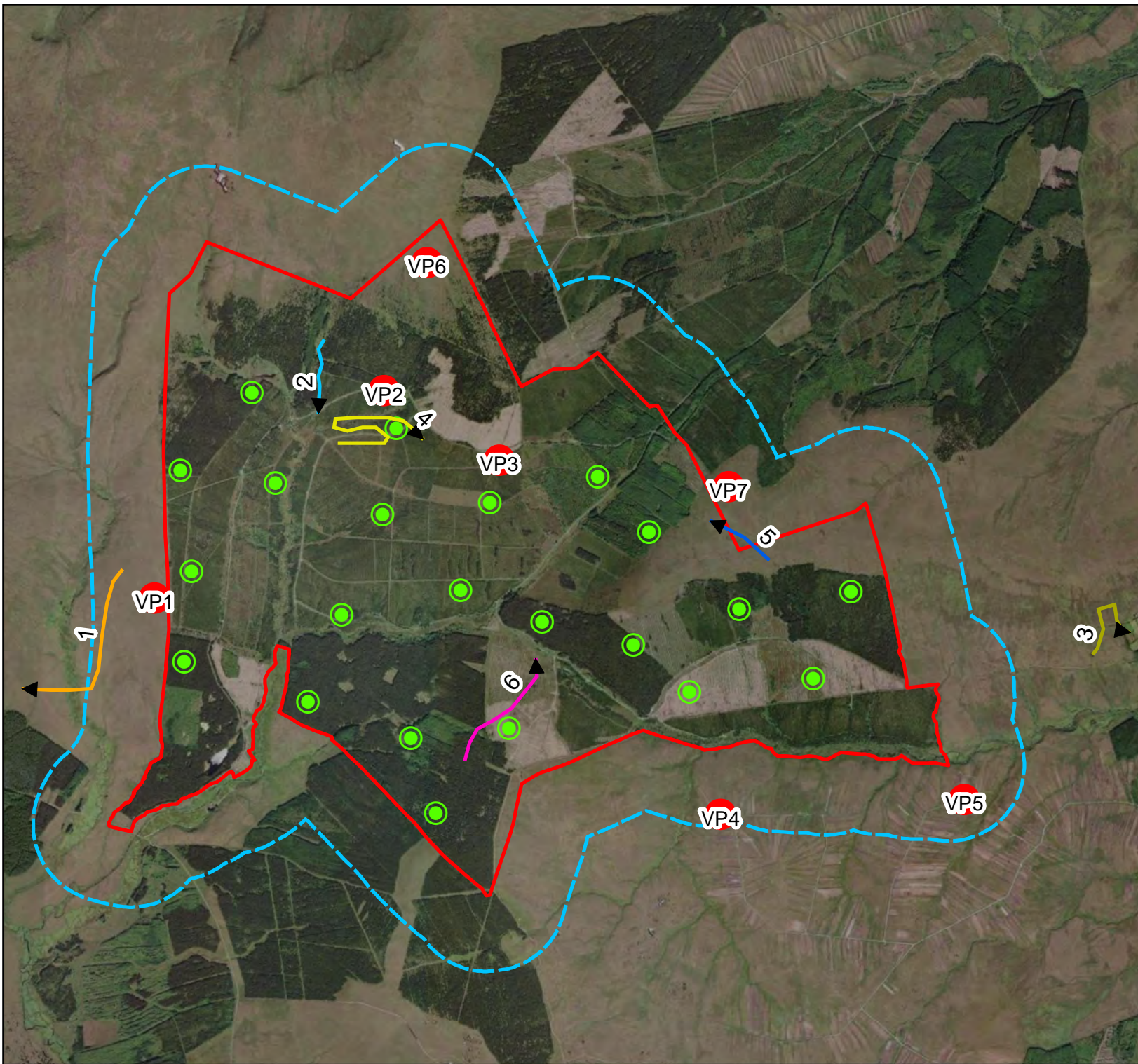
Client: SSE Renewables

Drawing Title:
Map 4-1 Hen Harrier

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Kestrel Flight Path

- ▶ 1, 15/10/19
- ▶ 2, 16/10/19
- ▶ 3, 17/10/19
- ▶ 4, 18/11/19
- ▶ 5, 19/11/19
- ▶ 6, 20/11/19

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0 0.75 1.5 km

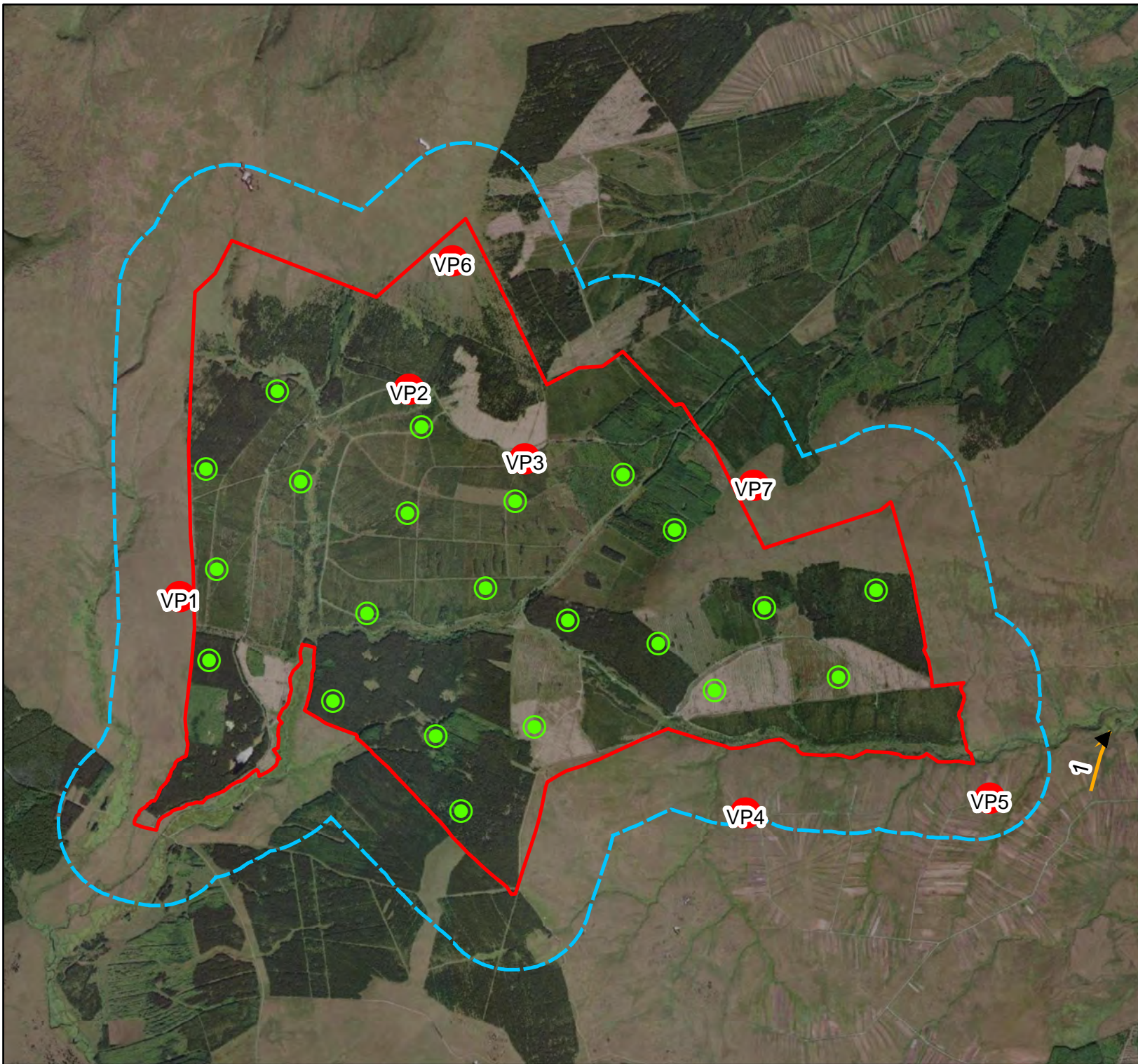
Project Title: 21424 -
 Glenora WF - Winter 2019/20 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 5-1 Kestrel

Drawn: VH	Checked: DoB
Date: 08/06/2023	Scale (A4): 1:35,000





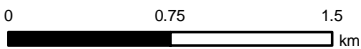
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Merlin Flight Path

➔ 1, 19/02/20

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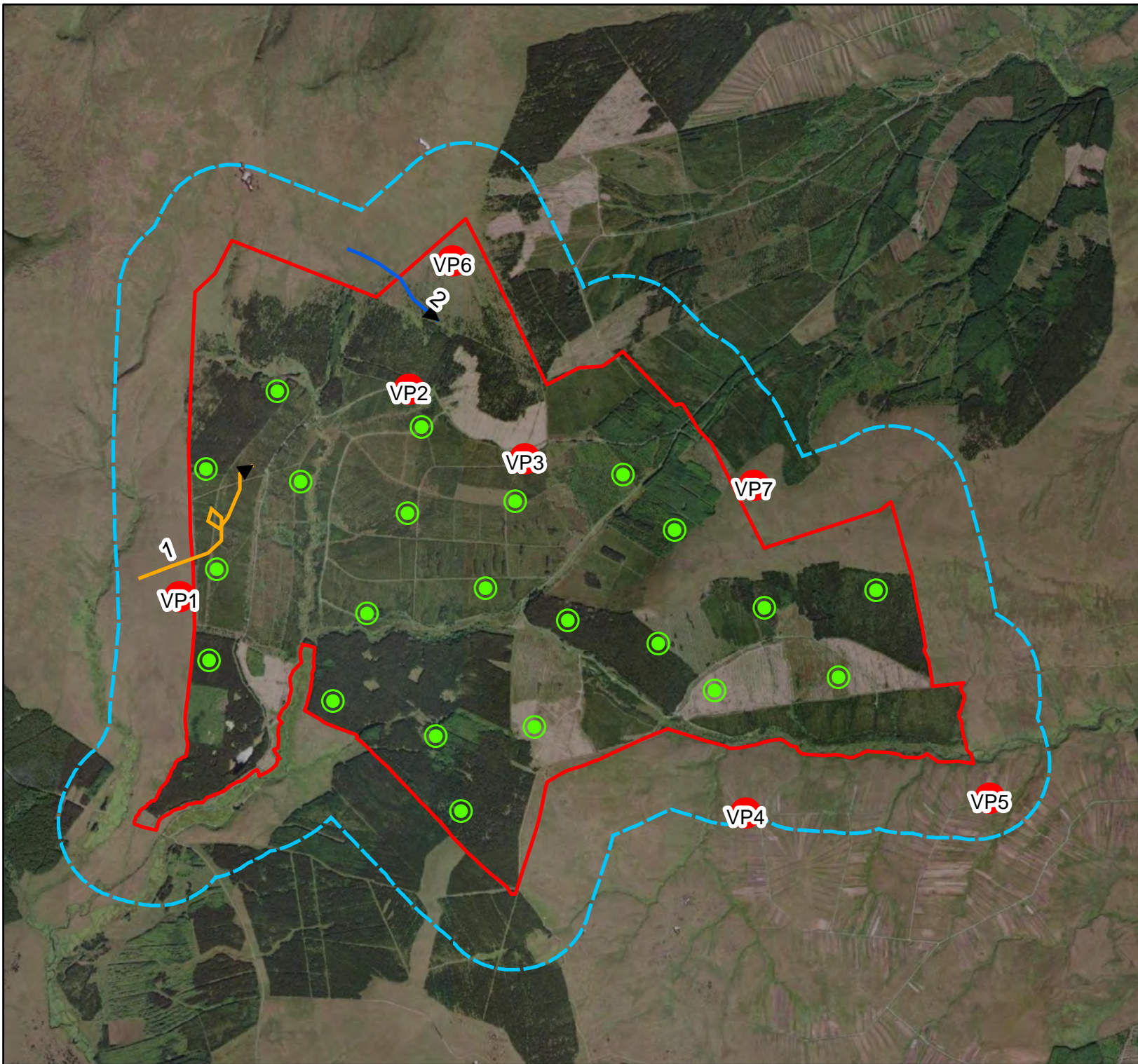
Project Title: 21424 -
Glenora WF - Winter 2019/20 bird surveys

Client: SSE Renewables

Drawing Title:
Map 6-1 Merlin

Drawn: VH	Checked: DoB
Date: 08/06/2023	Scale (A4): 1:35,000





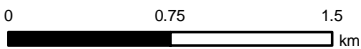
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Peregrine Flight Path

- 1, 15/10/19
- 2, 16/10/19

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Project Title: 21424 -
Glenora WF - Winter 2019/20 bird surveys

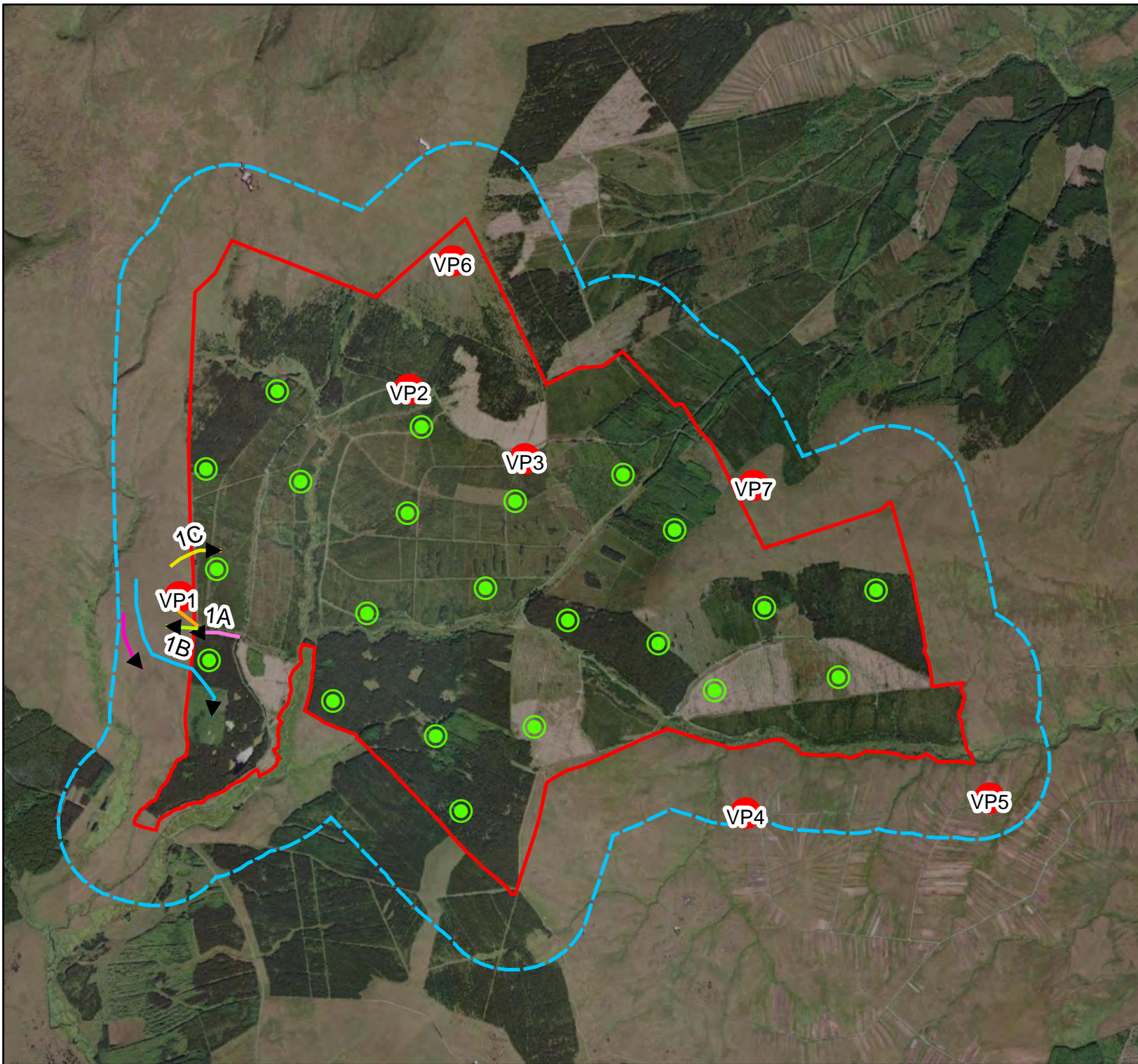
Client: SSE Renewables

Drawing Title:
Map 7-1 Peregrine

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Snipe Flight Path

- ▶ 1A, 21/01/20
- ▶ 1B, 21/01/20
- ▶ 1C, 21/01/20
- ▶ 2A, 18/02/20
- ▶ 2B, 18/02/20
- ▶ 2C, 18/02/20

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2019/20 bird surveys

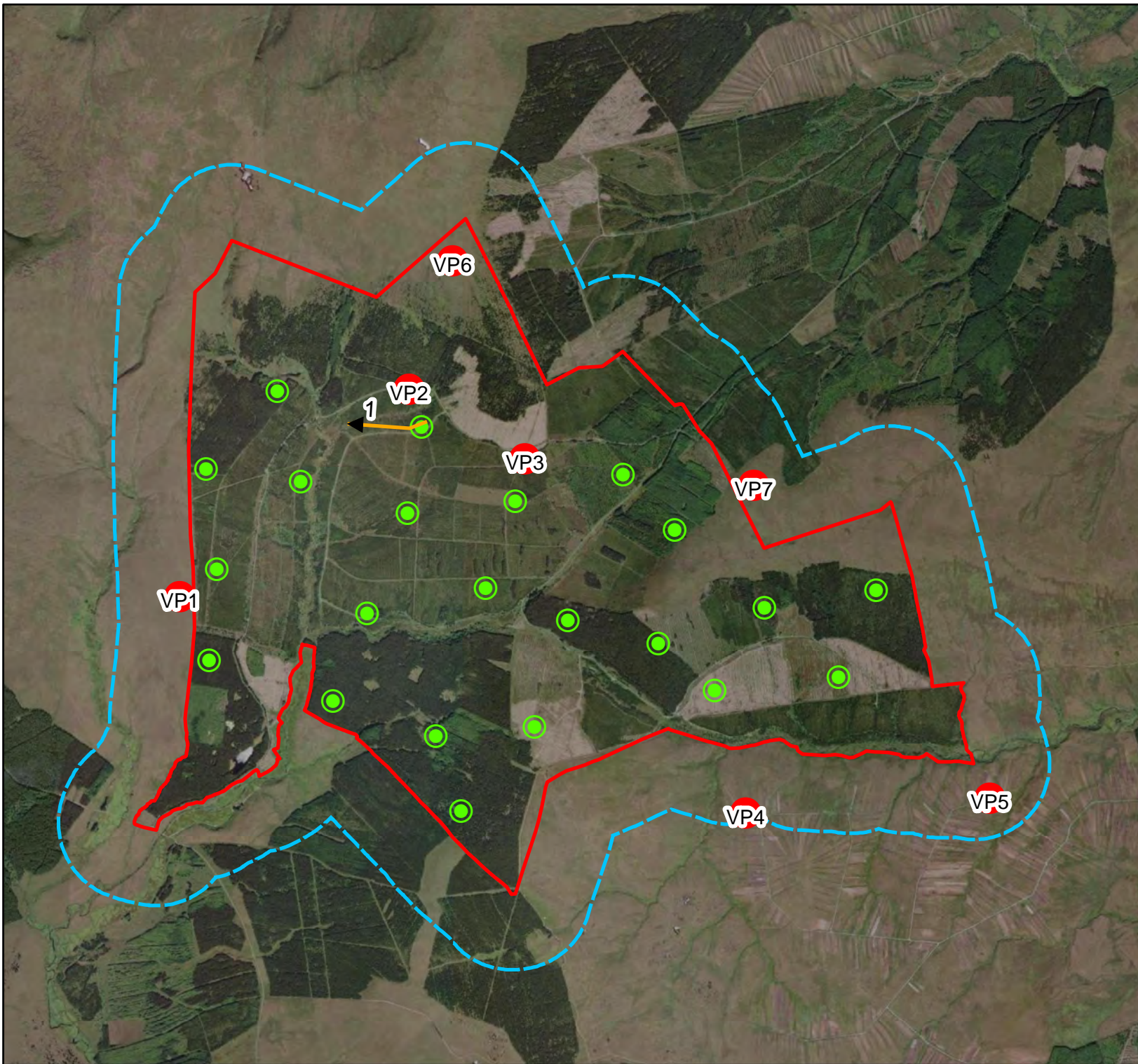
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Drawing Title:
 Map 8-1 Snipe

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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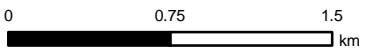
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area
- Turbine Locations
- ▭ Site Boundary

Woodcock Flight Path

➔ 1, 20/01/20

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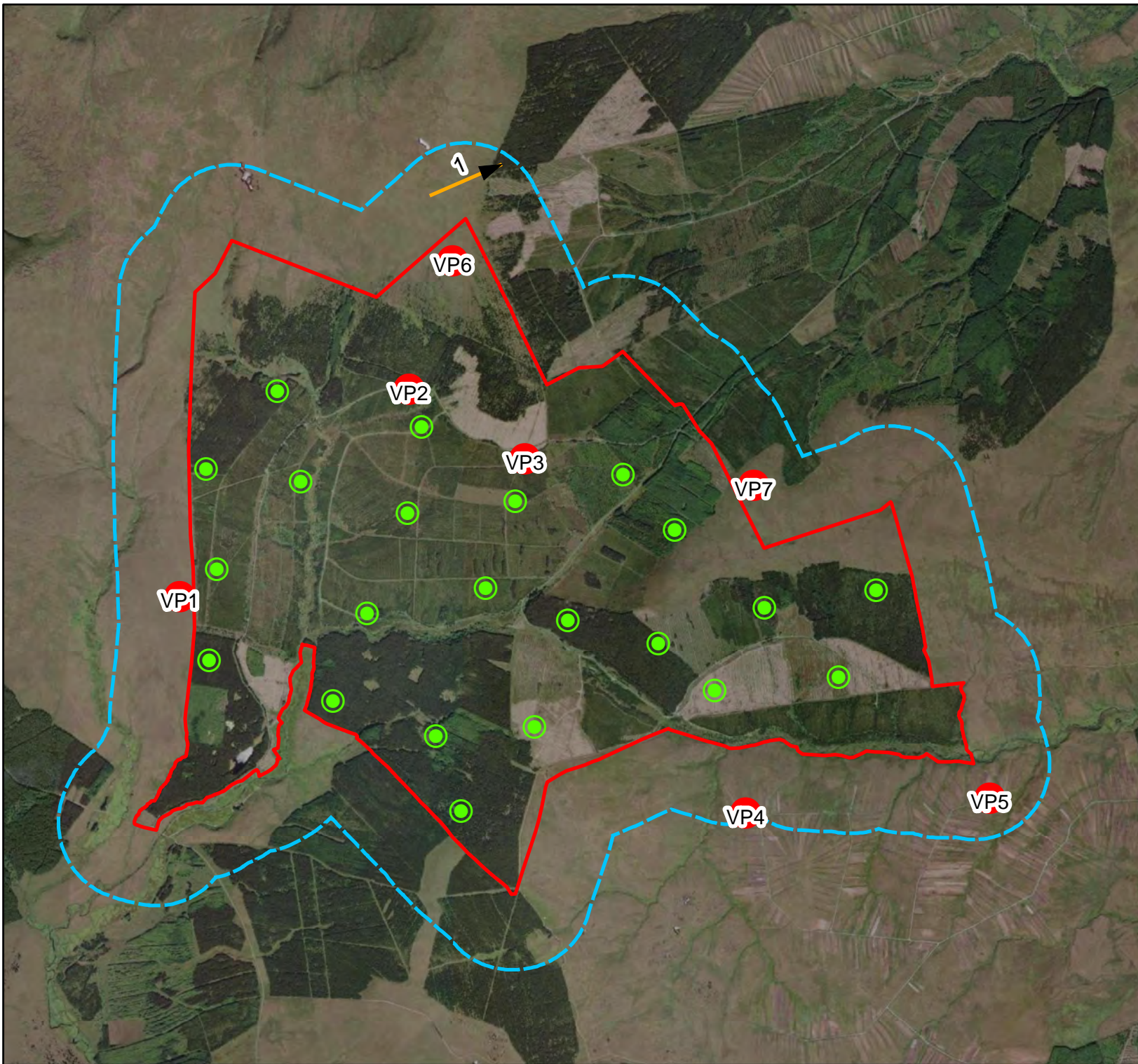
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Drawing Title:
Map 9-1 Woodcock

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





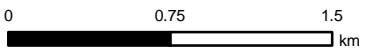
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Golden Plover Flight Path

▶ 1, 30/09/20

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Glenora WF - 2020 Breeding bird surveys

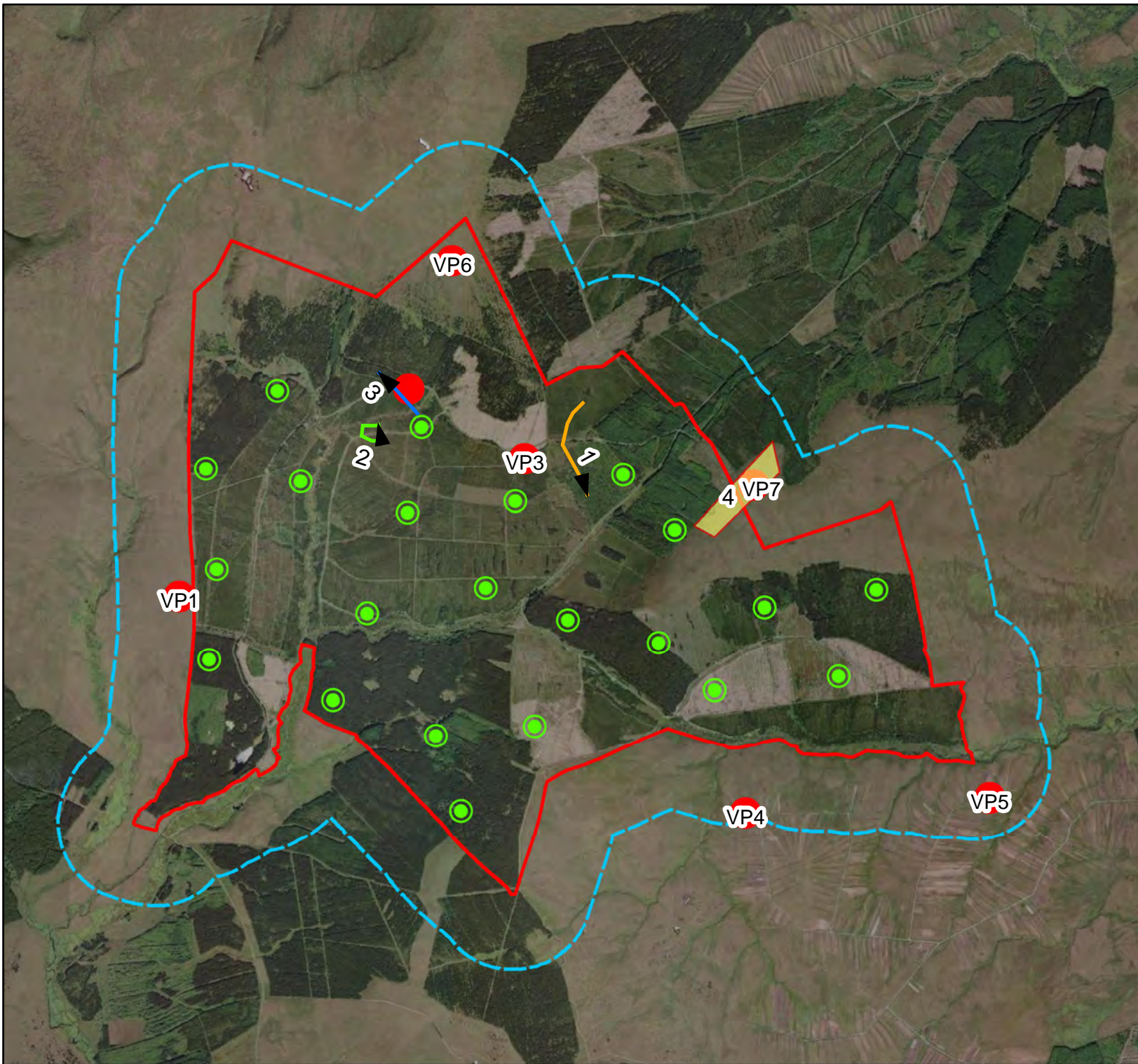
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Drawing Title:
Map 1-1 Golden Plover

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Kestrel Flight Path

- ▶ 1, 24/07/20
- ▶ 2, 24/08/20
- ▶ 3, 21/09/20

Kestrel Activity

- 4, 30/09/20

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0 0.75 1.5 km

Project Title: 21424 -
Glenora WF - 2020 Breeding bird surveys

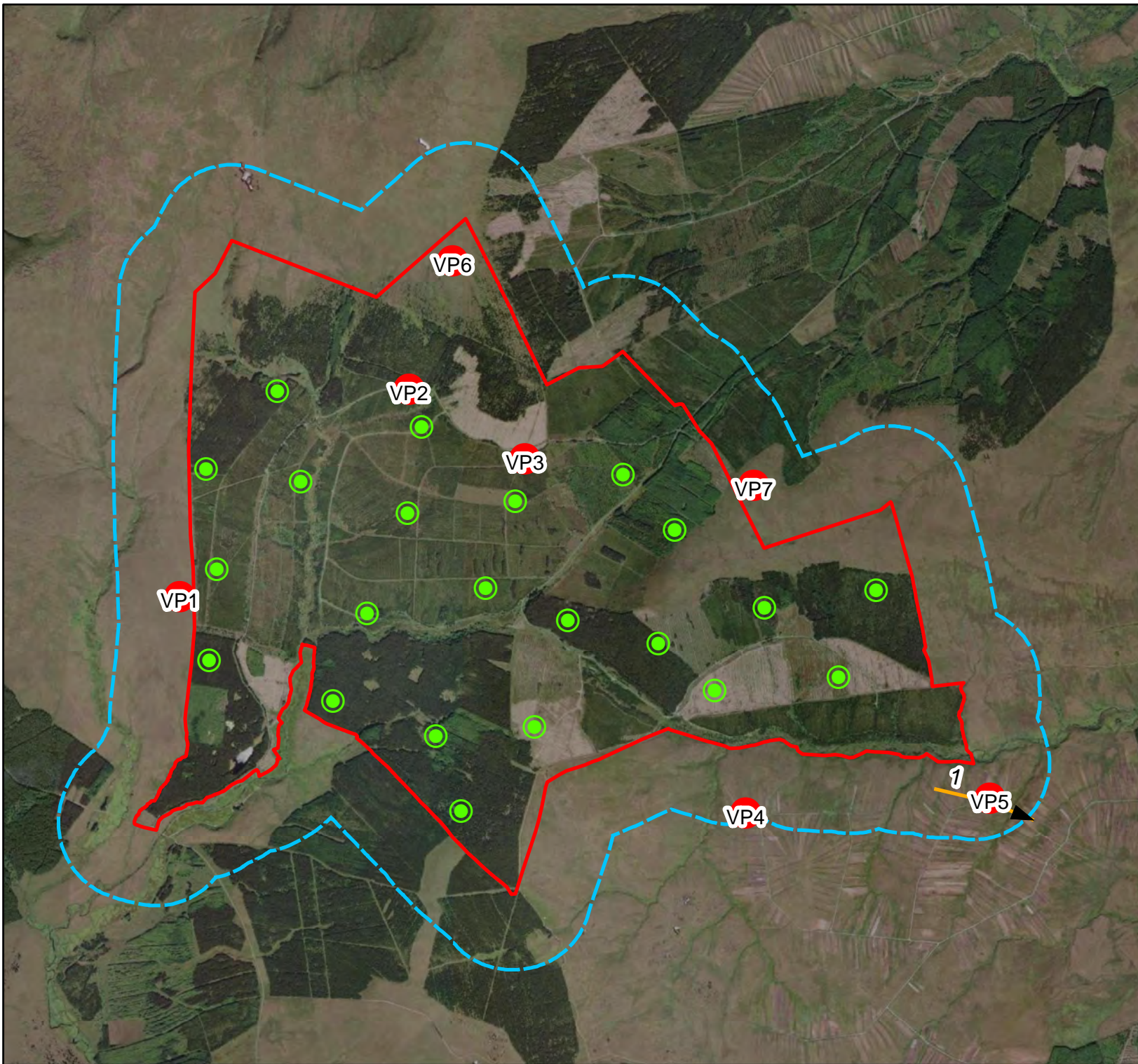
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Drawing Title:
Map 2-1 Kestrel

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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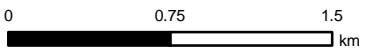
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Merlin Flight Path

➤ 1, 27/08/20

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Project Title: 21424 -
Glenora WF - 2020 Breeding bird surveys

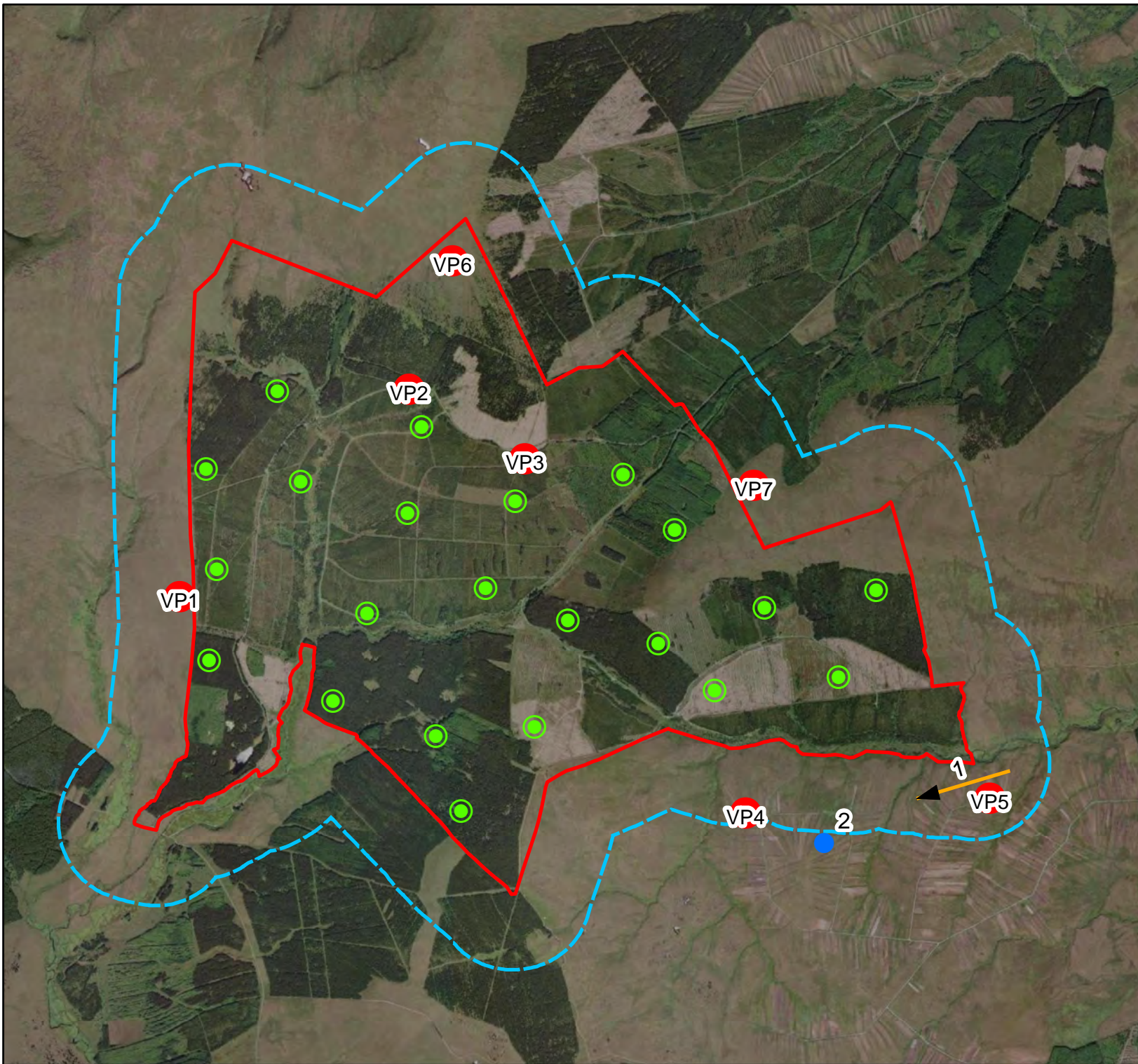
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Drawing Title:
Map 3-1 Merlin

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

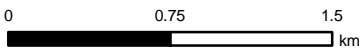
Red Grouse Flight Path

▶ 1, 07/05/20

Red Grouse Calling

● 2, 27/08/20

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Project Title: 21424 -
Glenora WF - 2020 Breeding bird surveys

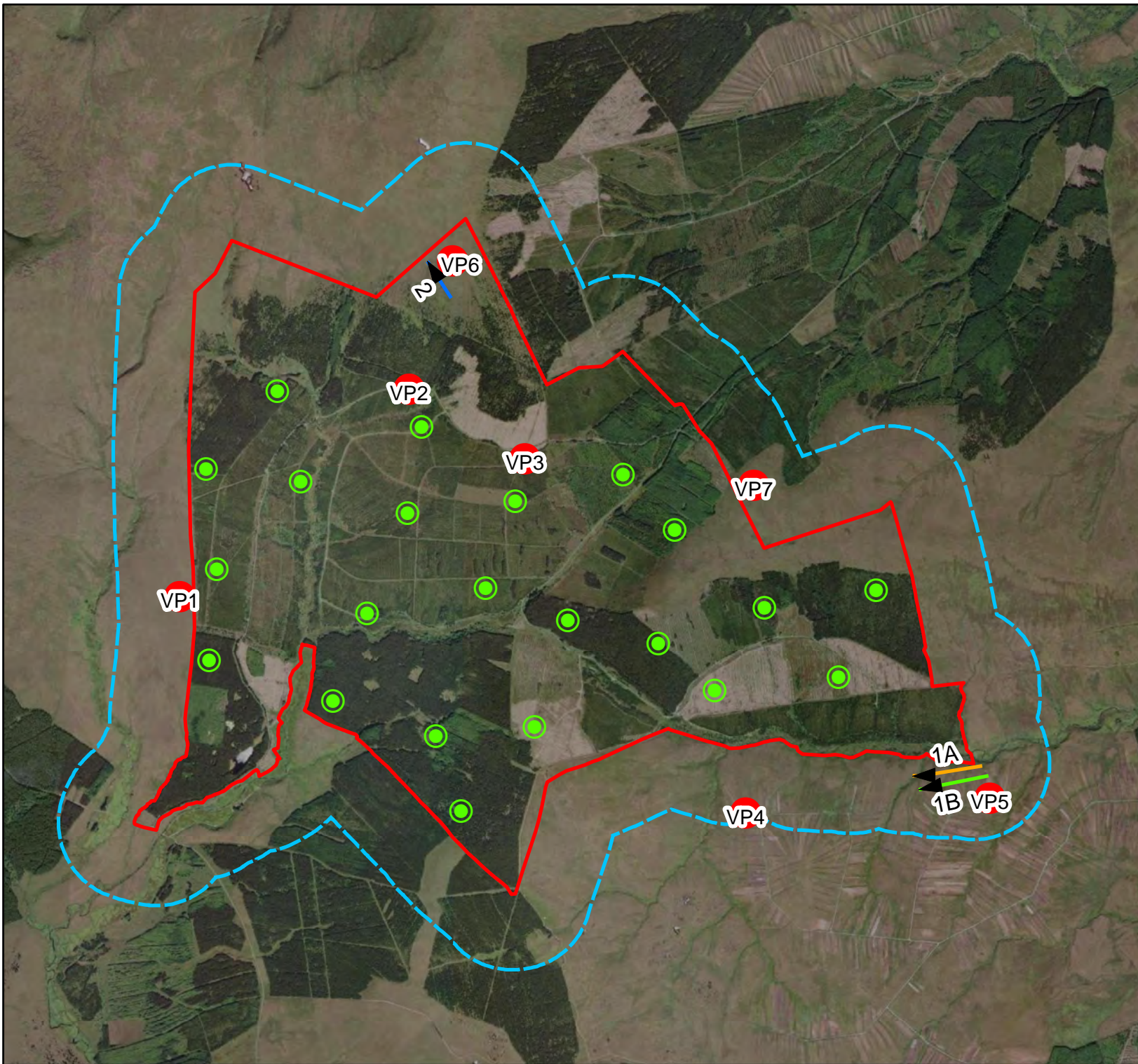
Client: SSE Renewables

Drawing Title:
Map 4-1 Red Grouse

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Snipe_FP

Snipe Flight Path

- ▶ 1A, 22/05/20
- ▶ 1B, 22/05/20
- ▶ 2, 30/09/20

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2020 Breeding bird surveys

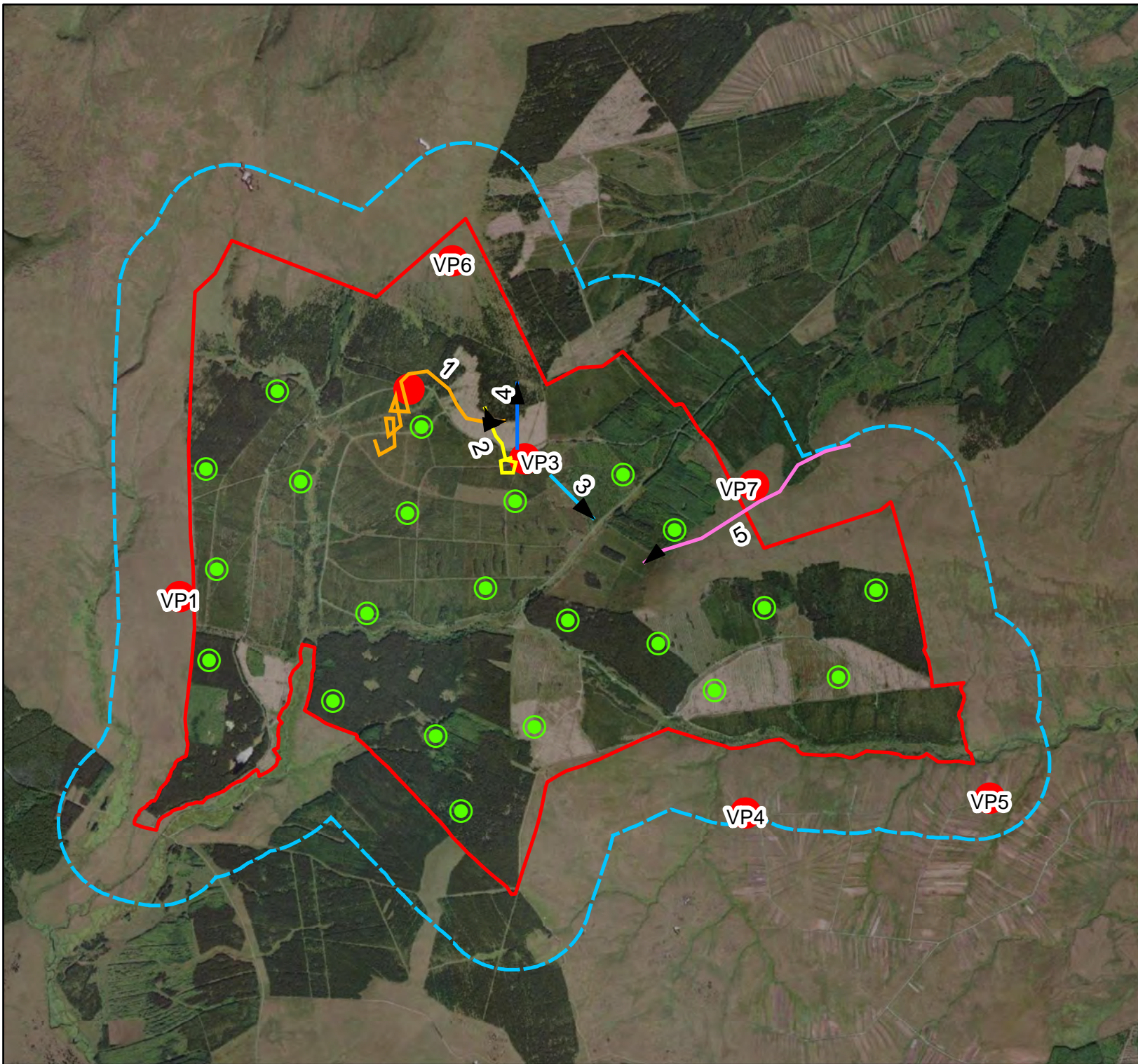
Client: SSE Renewables

Drawing Title:
 Map 5-1 Snipe

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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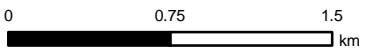
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Sparrowhawk Flight Path

- ▶ 1, 20/05/20 (incidental)
- ▶ 2, 24/08/20
- ▶ 3, 21/09/20
- ▶ 4, 21/09/20
- ▶ 5, 30/09/20

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Project Title: 21424 -
Glenora WF - 2020 Breeding bird surveys

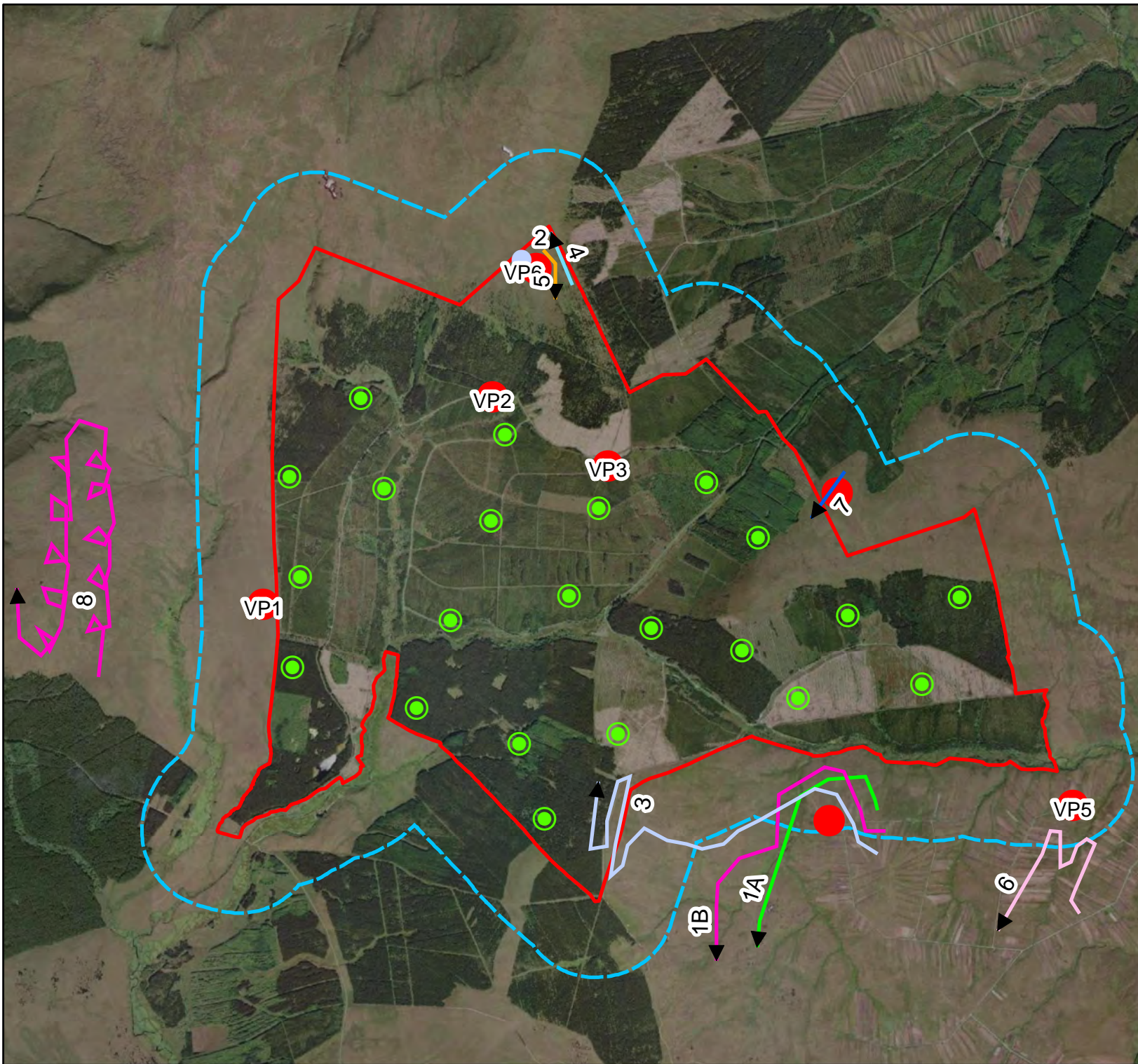
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Drawing Title:
Map 6-1 Sparrowhawk

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

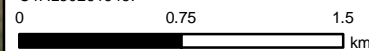
Golden Plover Flight Path

- ▶ 1A, 14/12/20
- ▶ 1B, 14/12/20
- ▶ 3, 14/12/20
- ▶ 4, 21/01/21
- ▶ 5, 21/01/21
- ▶ 6, 21/01/21
- ▶ 7, 24/02/21
- ▶ 8, 24/02/21

Golden Plover Calling

- 2, 14/12/20

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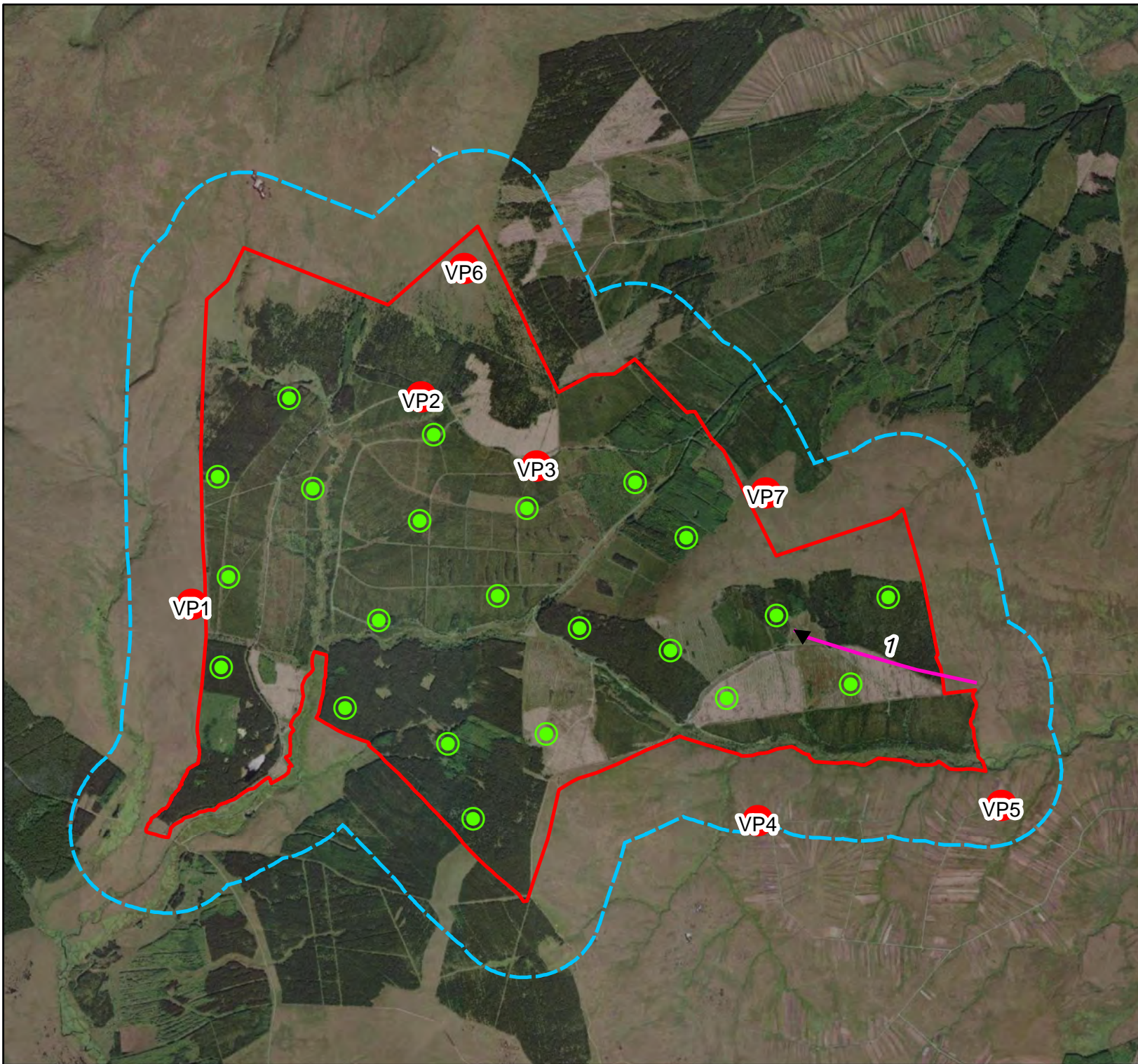
Project Title: 21424 -
Glenora WF - Winter 2020/21 bird surveys

Client: SSE Renewables

Drawing Title:
Map 1-1 Golden Plover

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





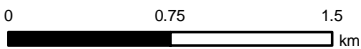
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Great Black-backed Gull Flight Path

➤ 1, 15/02/21

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Project Title: 21424 -
Glenora WF - Winter 2020/21 bird surveys

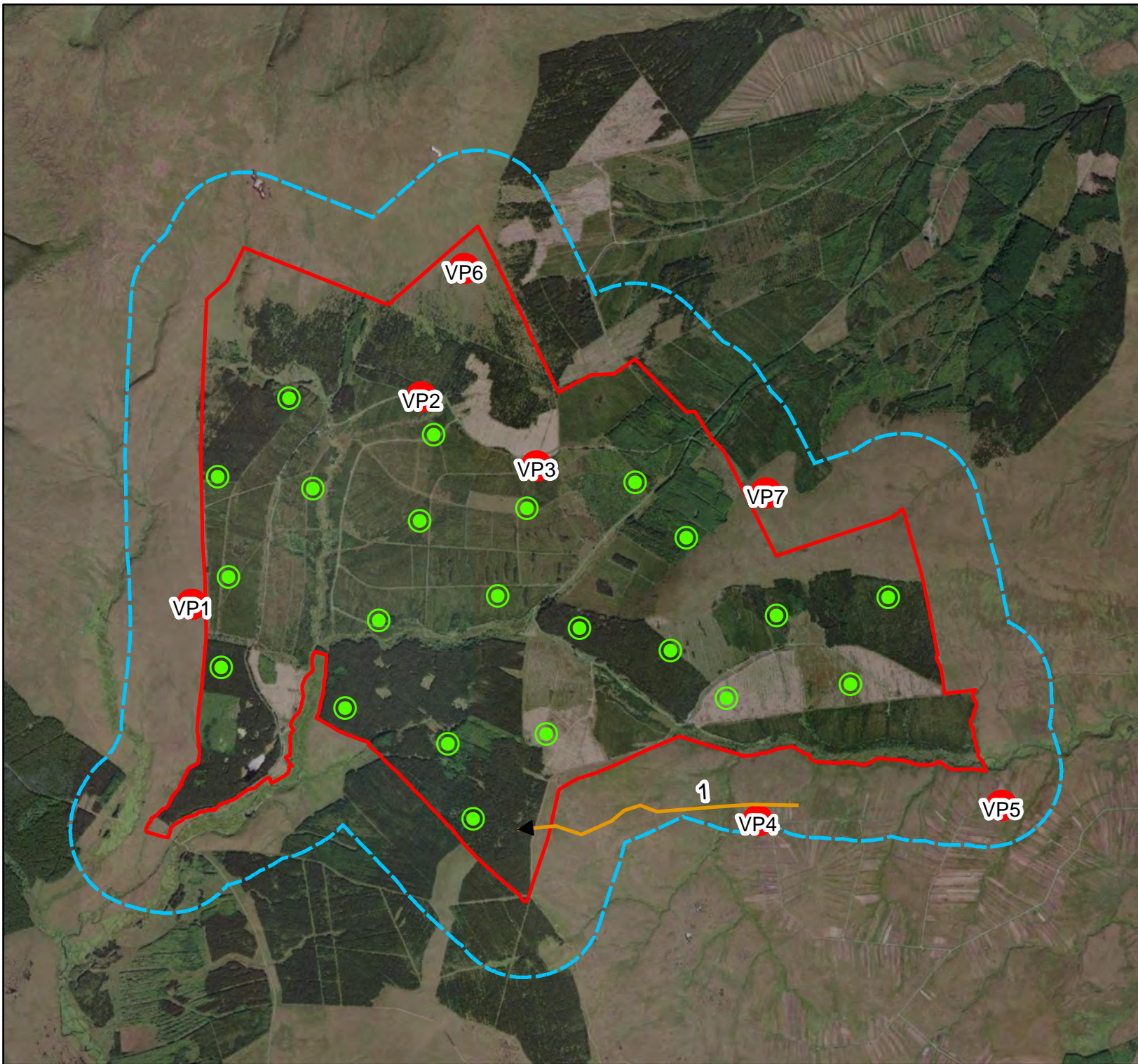
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Drawing Title:
Map 2-1 Great Black-backed Gull

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000

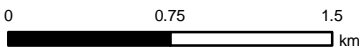




Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Hen Harrier Flight Path**
- ➔ 1, 14/12/20

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Project Title: 21424 -
Glenora WF - Winter 2020/21 bird surveys

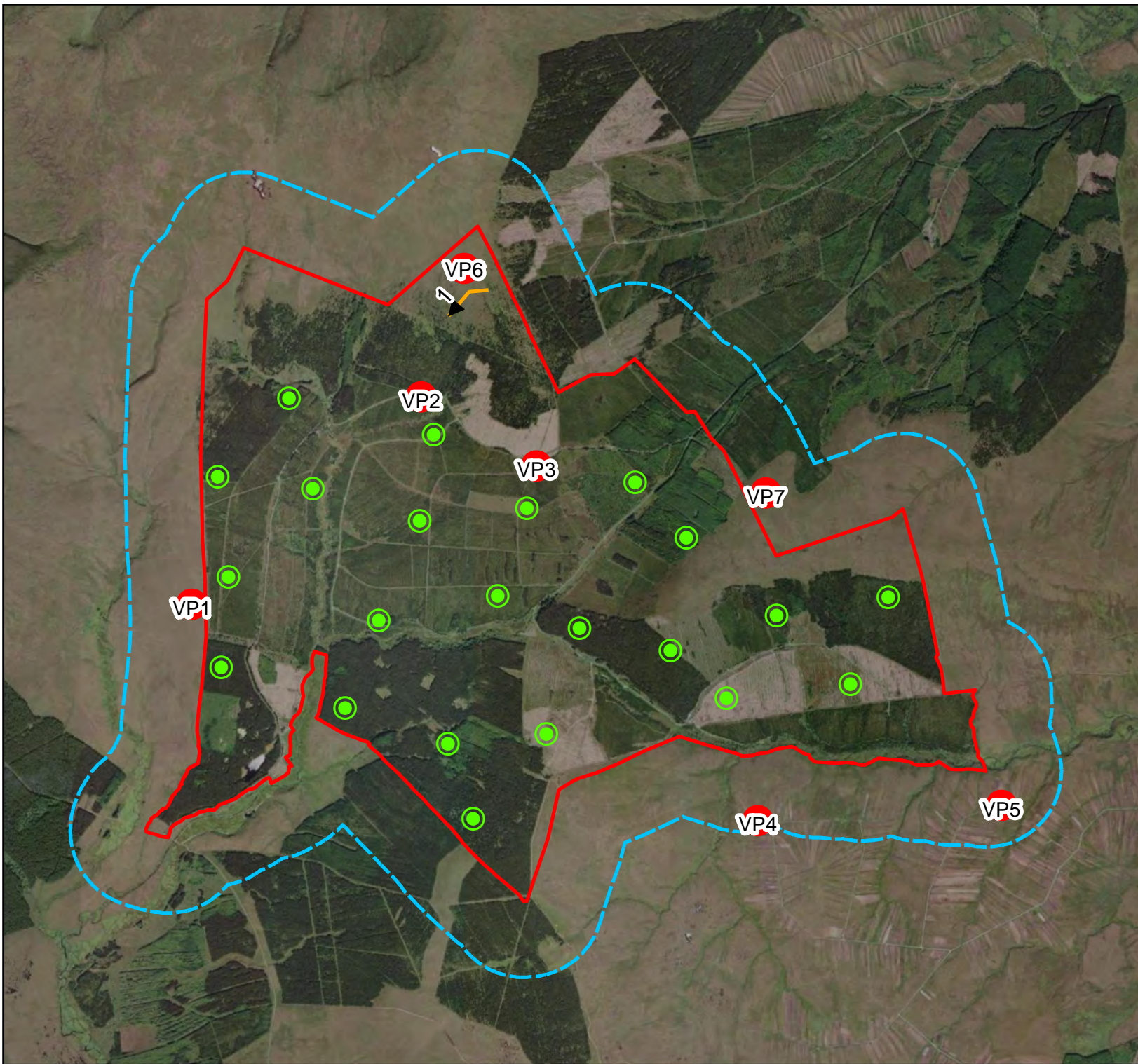
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Drawing Title:
Map 3-1 Hen Harrier

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





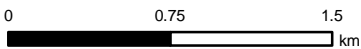
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Icelandic Gull Flight Path

➔ 1, 22/03/2021

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Glenora WF - Winter 2020/21 bird surveys

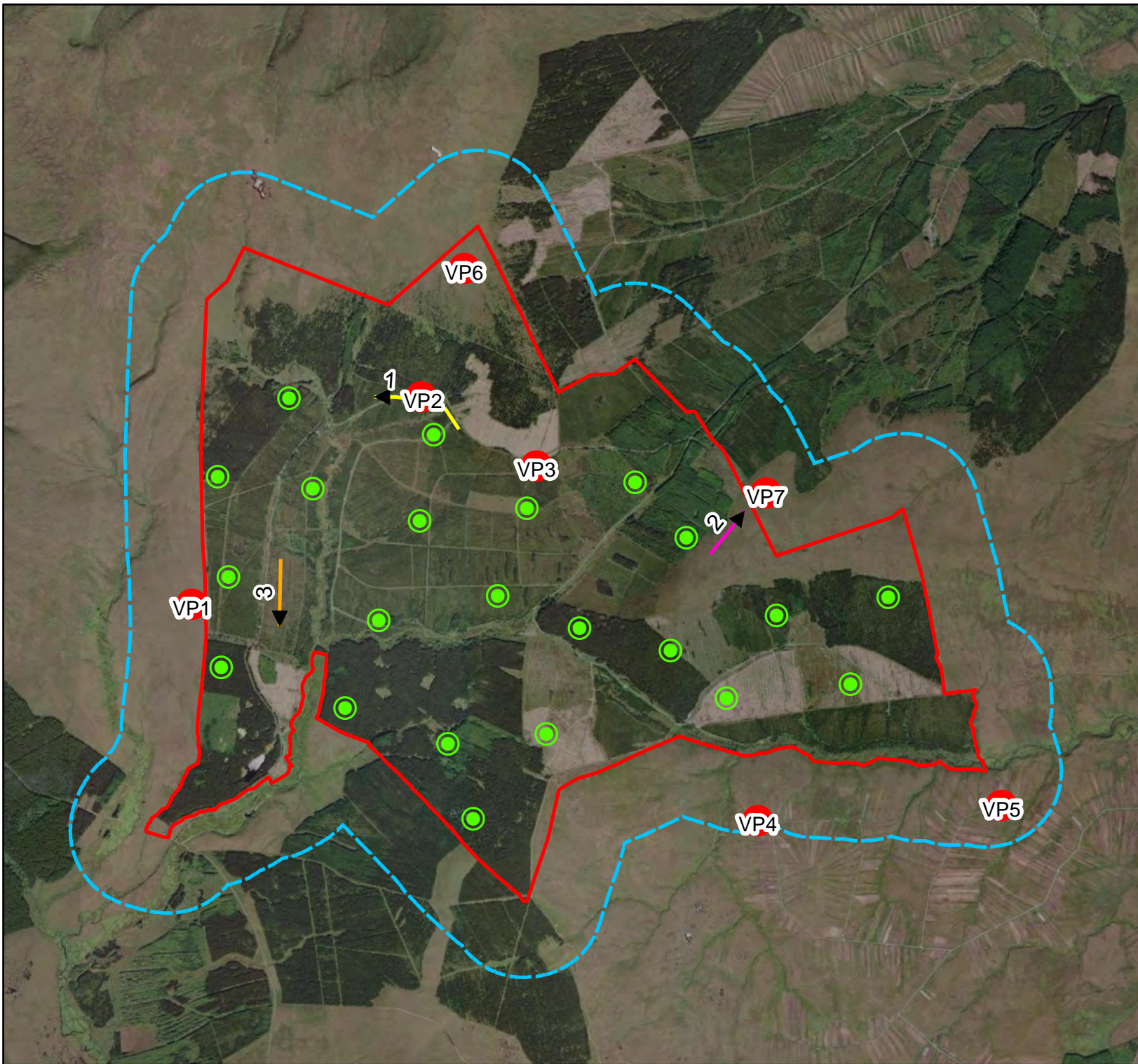
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Drawing Title:
Map 4-1 Icelandic Gull

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





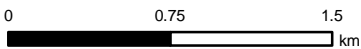
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Kestrel Flight Path

- ▶ 1, 20/11/20
- ▶ 2, 25/11/20
- ▶ 3, 25/11/20

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Project Title: 21424 -
Glenora WF - Winter 2020/21 bird surveys

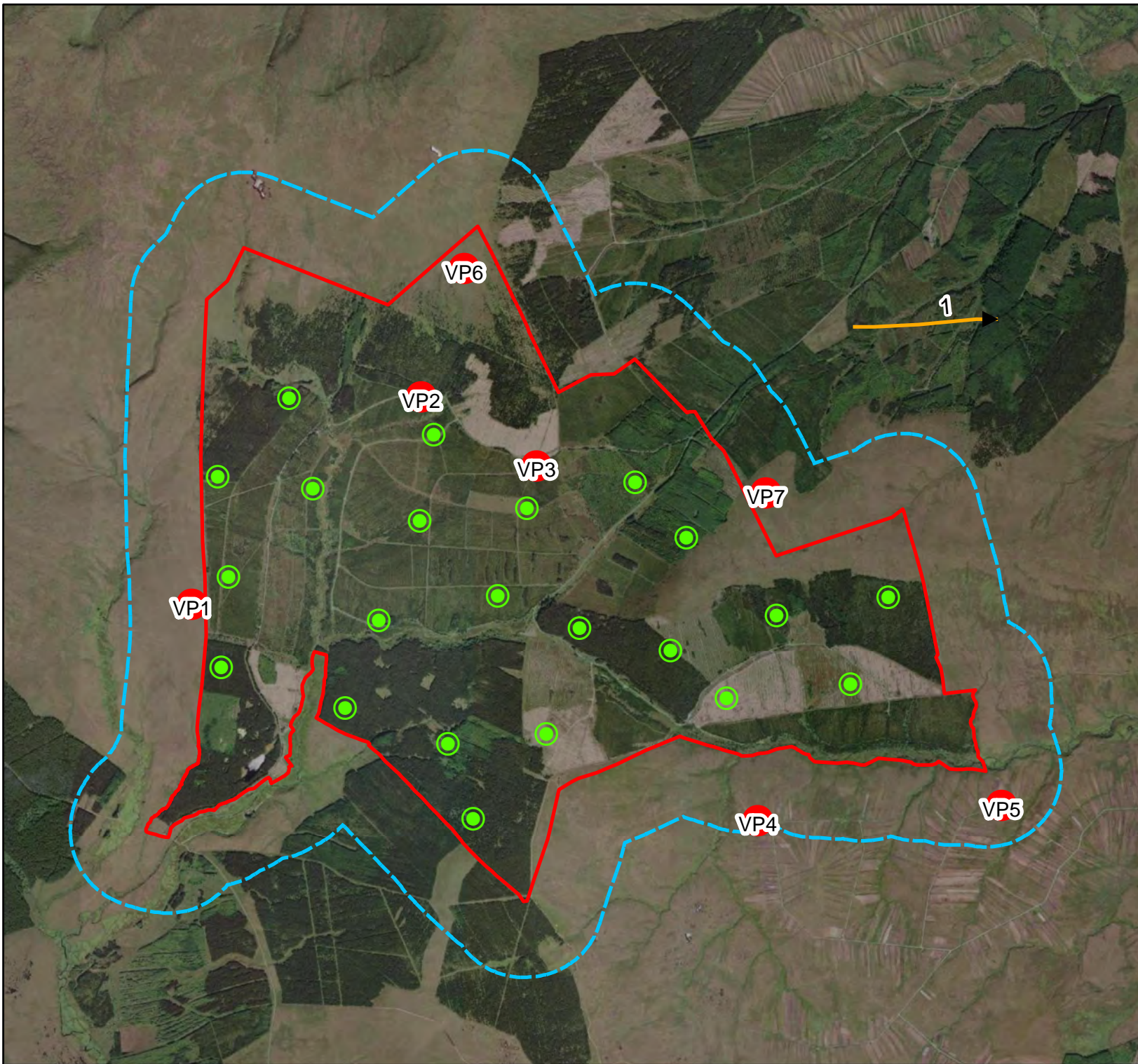
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Drawing Title:
Map 5-1 Kestrel

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





- Legend**
- Site Boundary
 - Vantage Point Locations
 - Flight Activity Survey Area 500m
 - Turbine Locations
- Mallard Flight Path**
- ➔ 1, 15/02/21

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2020/21 bird surveys

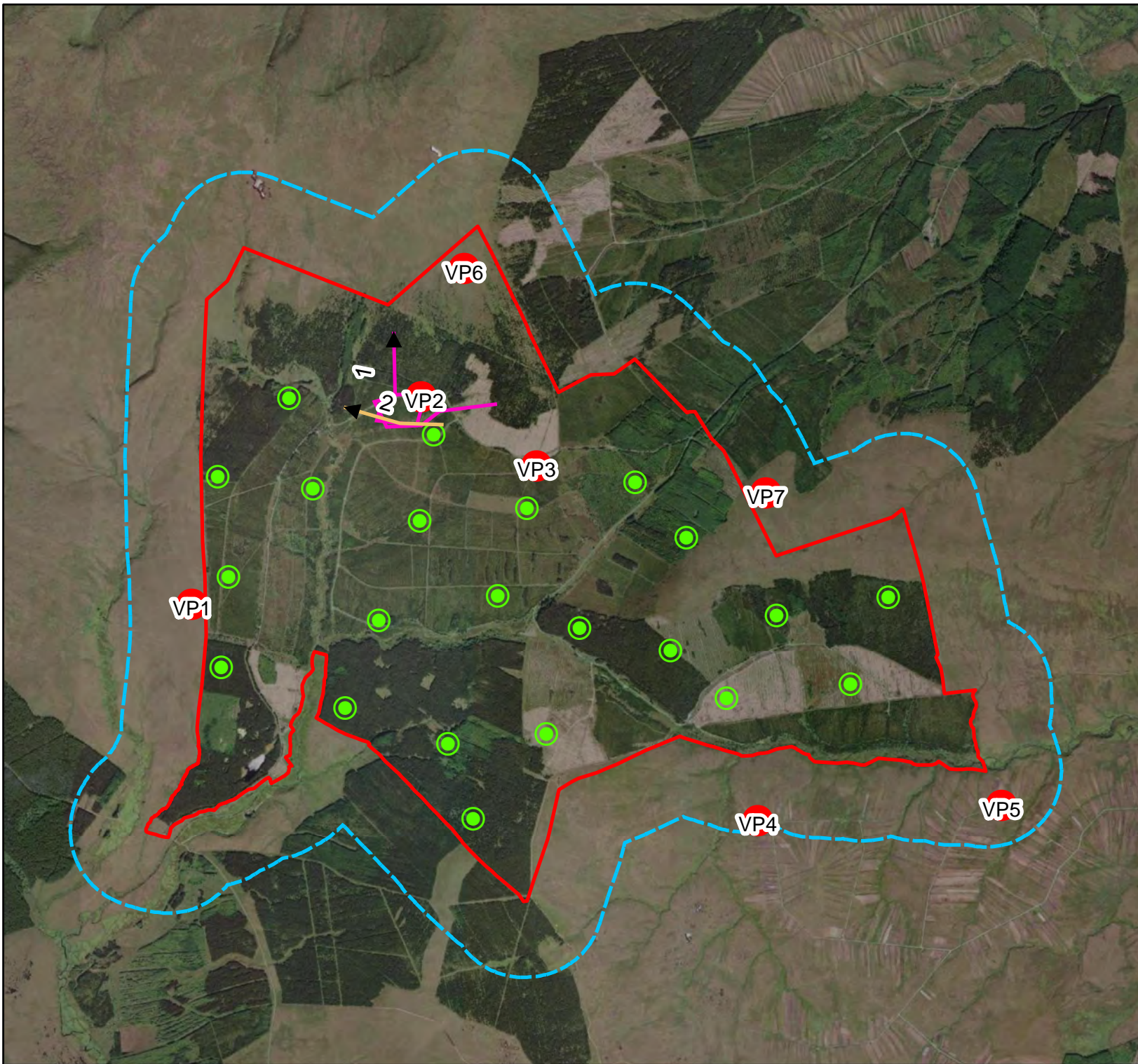
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Drawing Title:
 Map 6-1 Mallard

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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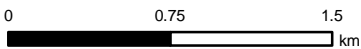
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Peregrine Flight Path

- 1, 14/12/20
- 2, 22/03/2021

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Project Title: 21424 -
Glenora WF - Winter 2020/21 bird surveys

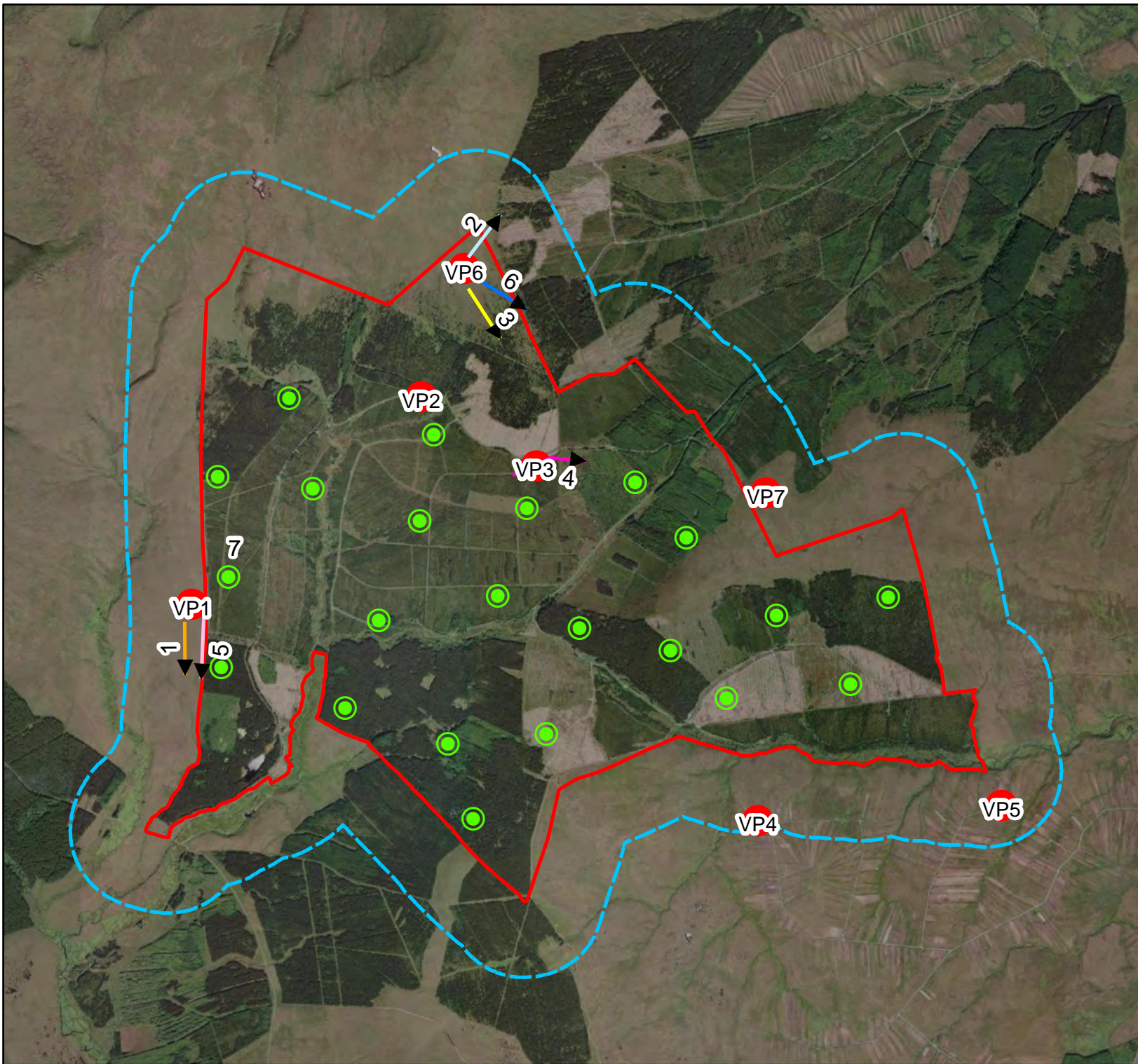
Client: SSE Renewables

Drawing Title:
Map 7-1 Peregrine

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe Flight Path

- ▶ 1, 27/10/20
- ▶ 2, 25/11/20
- ▶ 3, 21/01/21
- ▶ 4, 25/01/21
- ▶ 5, 19/02/21
- ▶ 6, 24/02/21 (incidental)

Snipe Calling

- 7, 24/02/21

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2020/21 bird surveys

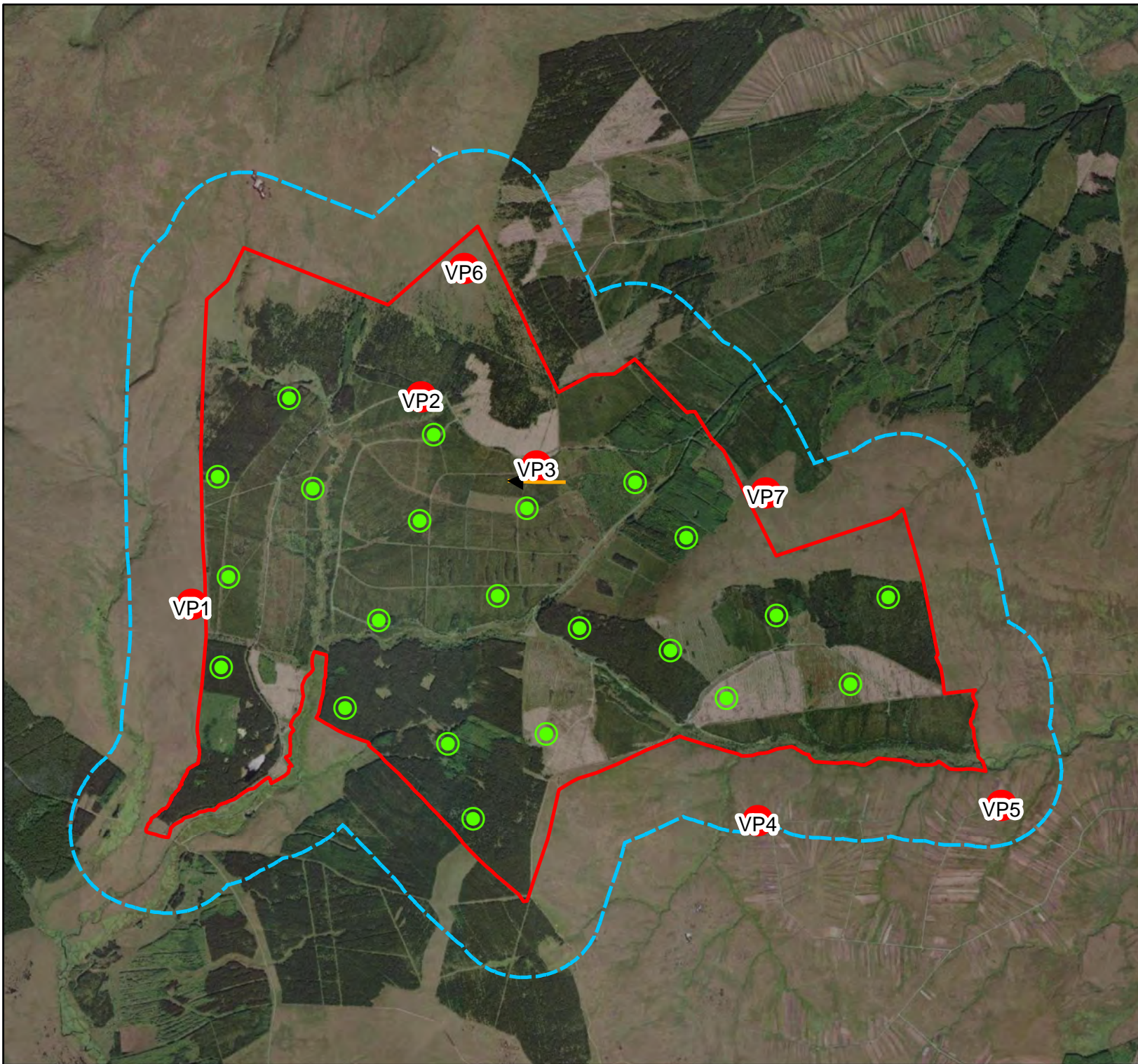
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Drawing Title:
 Map 8-1 Snipe

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Sparrowhawk Flight Path

➔ 1, 16/12/20

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2020/21 bird surveys

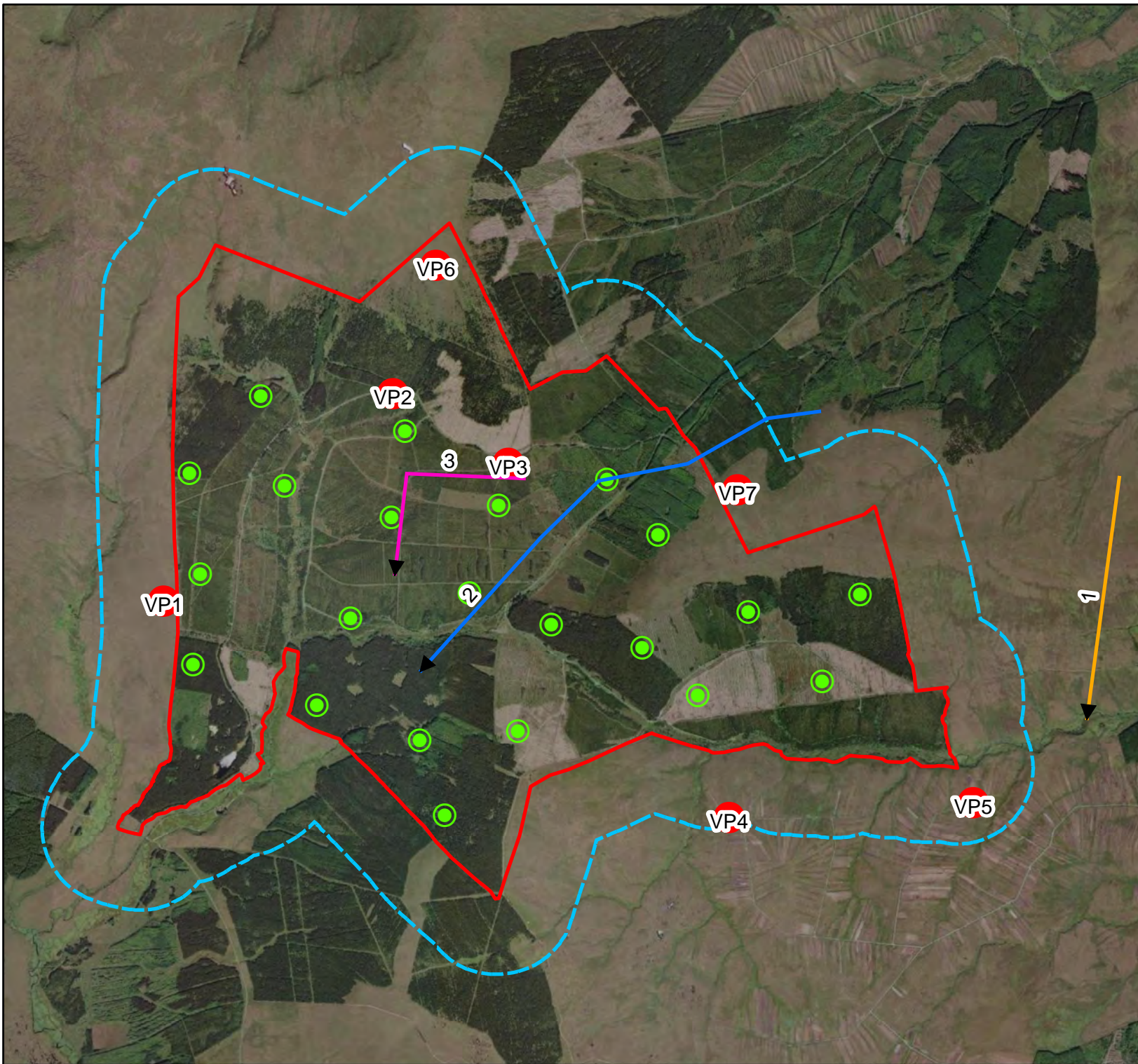
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Drawing Title:
 Map 9-1 Sparrowhawk

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Whooper Swan Flight Path

- ▶ 1, 15/10/2021
- ▶ 2, 15/10/2021
- ▶ 3, 15/10/2021

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2020/21 bird surveys

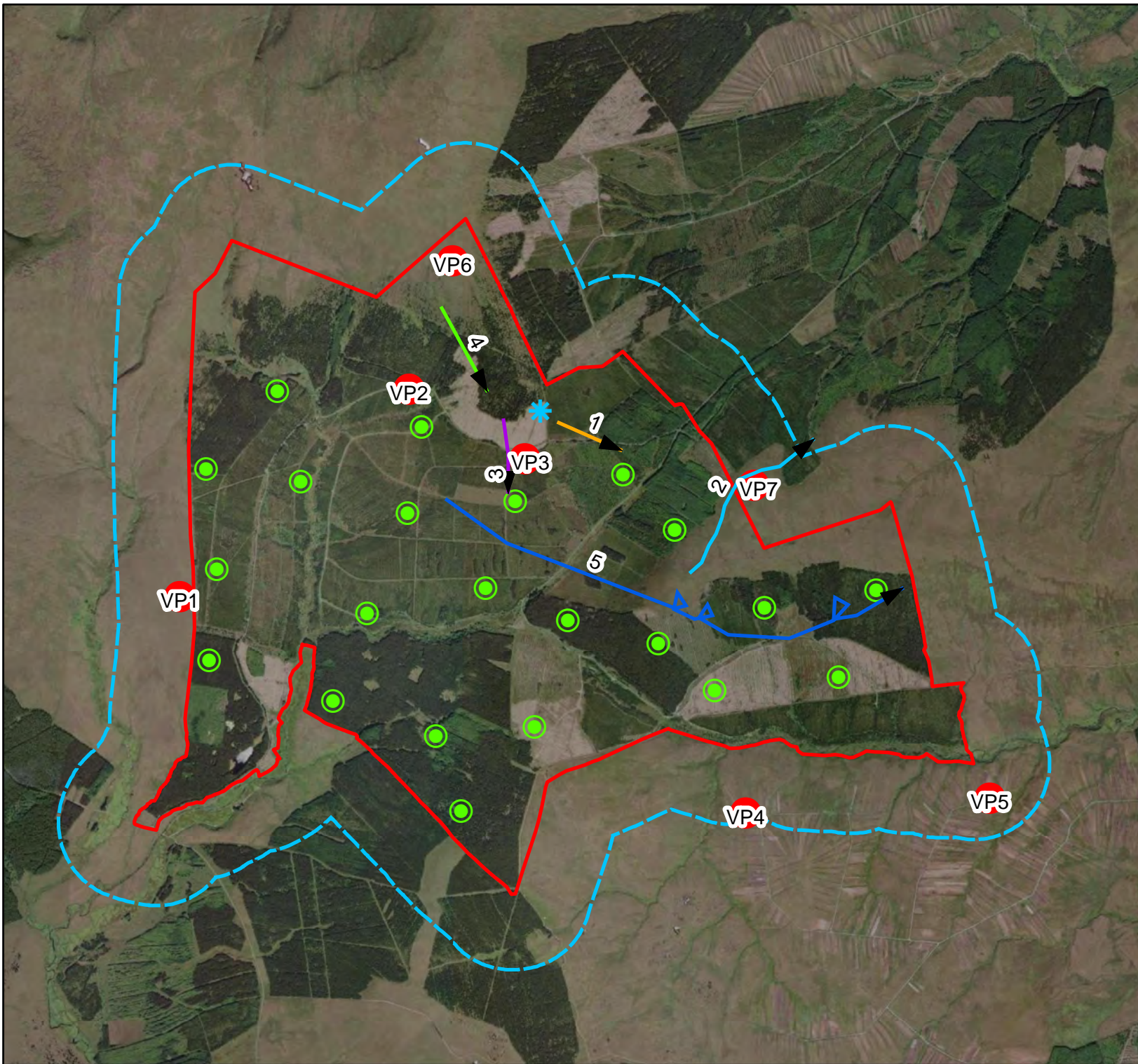
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Drawing Title:
 Map 10-1 Whooper Swan

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Buzzard Perched

- ✱ 1, 28/05/2021

Buzzard Flight Path

- 1, 28/05/2021
- 2, 14/06/2021
- 3, 15/07/2021
- 4, 15/07/2021
- 5, 23/08/2021

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0 0.75 1.5 km

Project Title: 21424 -
Glenora WF - 2021 Breeding bird surveys

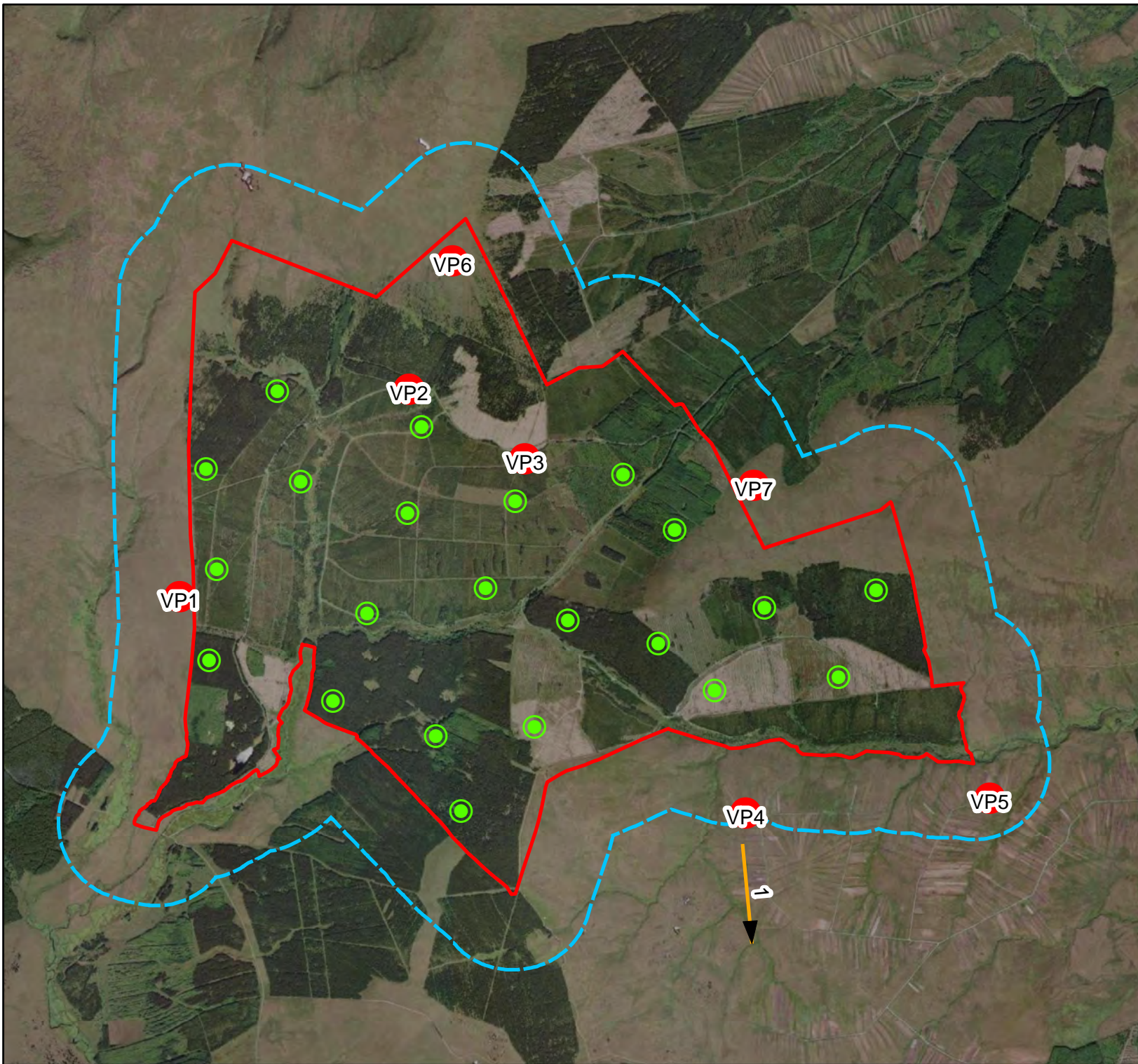
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Drawing Title:
Map 1-1 Buzzard

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations

Golden Plover Flight Path

- ▶ 1, 21/04/2021

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

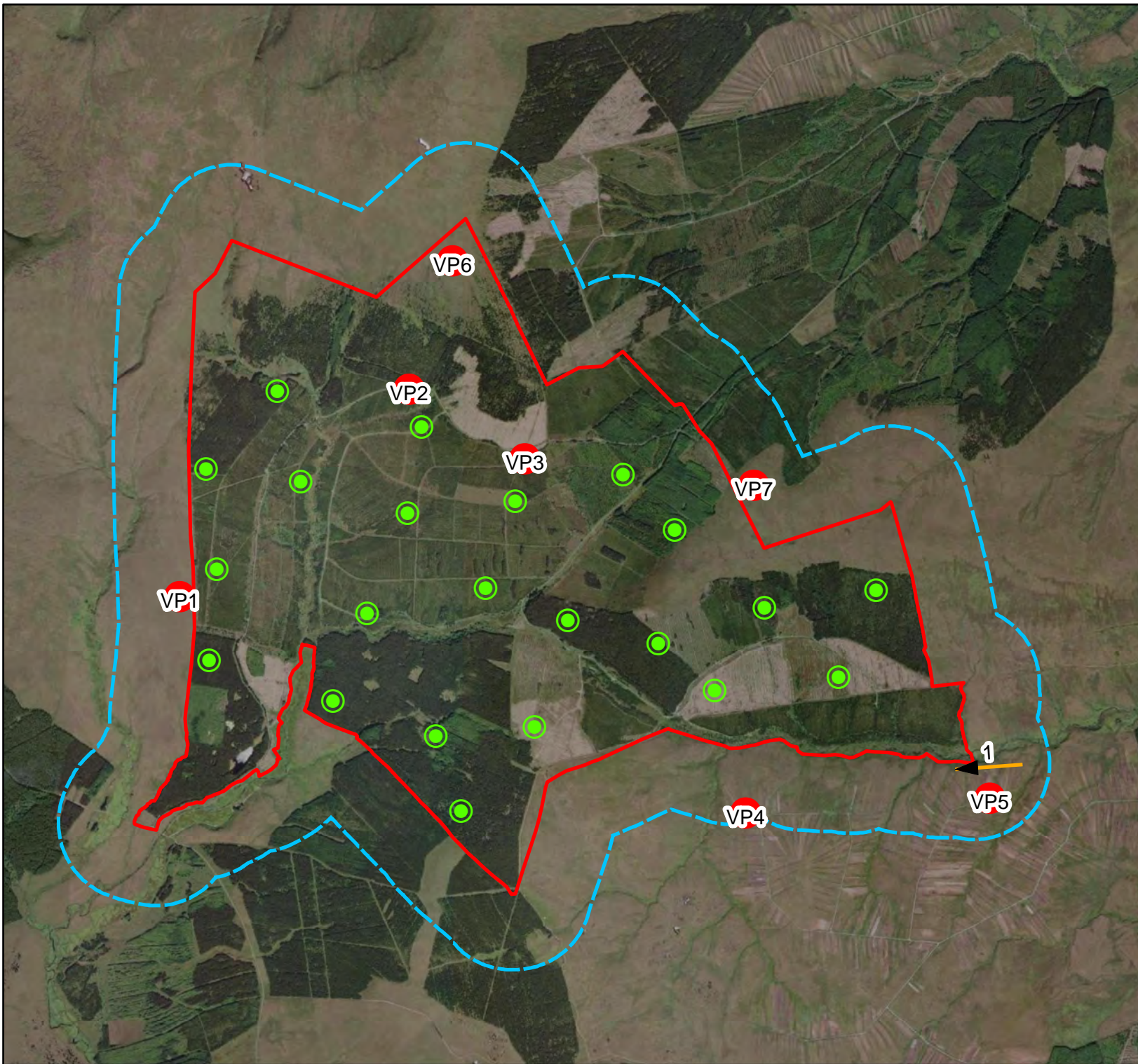
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Drawing Title:
 Map 2-1 Golden Plover

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Great Black-backed Gull Flight Path

- ▶ 1, 24/05/2021

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

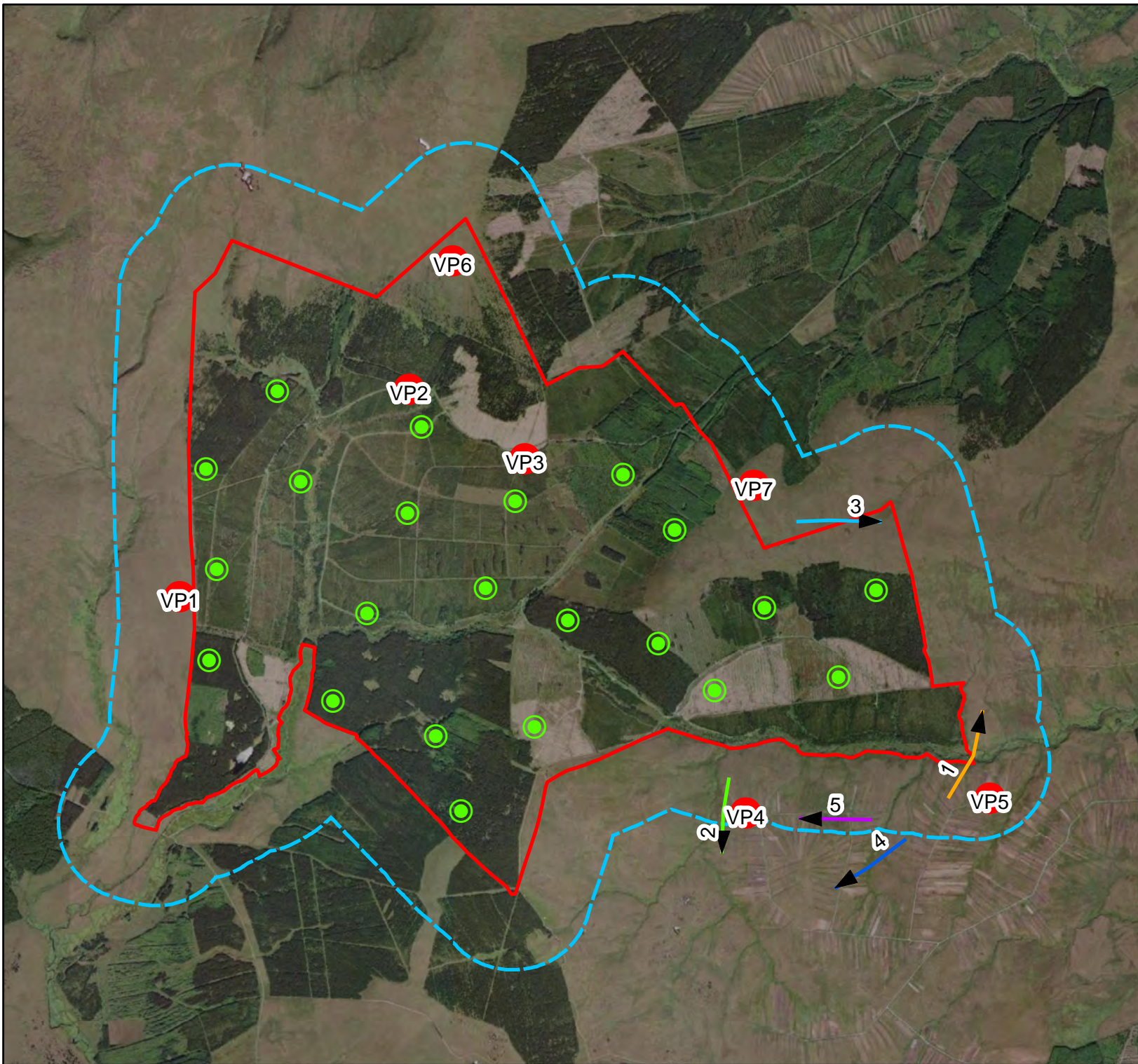
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Drawing Title:
 Map 3-1 Great Black-backed Gull

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Kestrel Flight Path

- ▶ 1, 24/05/2021
- ▶ 2, 16/08/2021
- ▶ 3, 17/09/2021
- ▶ 4, 17/09/2021
- ▶ 5, 17/09/2021

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

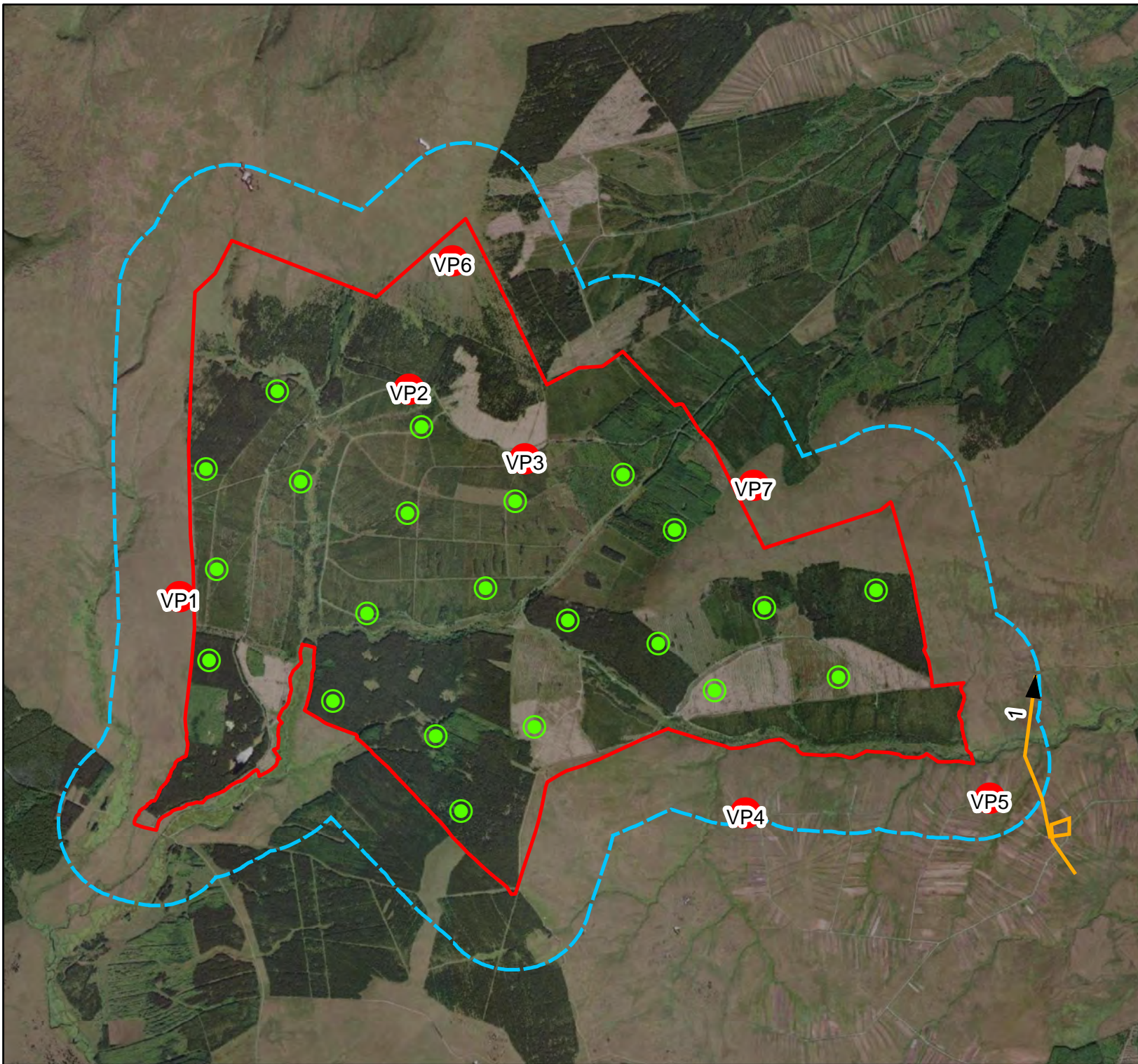
Client: SSE Renewables

Drawing Title:
 Map 4-1 Kestrel

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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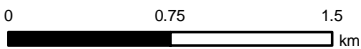
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Peregrine Flight Path

- ▶ 1, 19/08/2021

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Project Title: 21424 -
Glenora WF - 2021 Breeding bird surveys

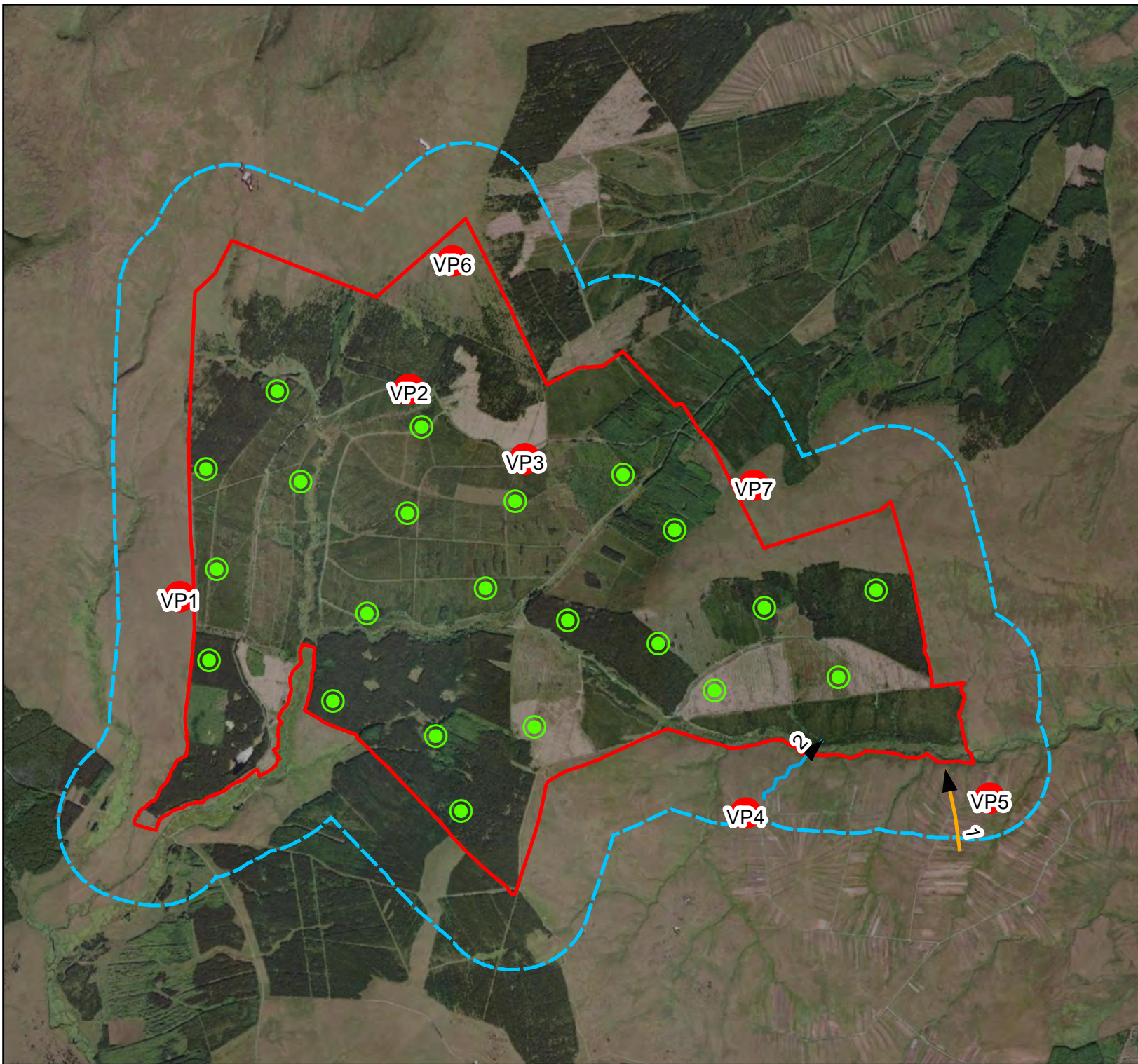
Client: SSE Renewables

Drawing Title:
Map 5-1 Peregrine

Drawn: VH Checked: DoB

Date: 08/06/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe Flight Path

- ▶ 1, 21/04/2021
- ▶ 2, 20/09/2021

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

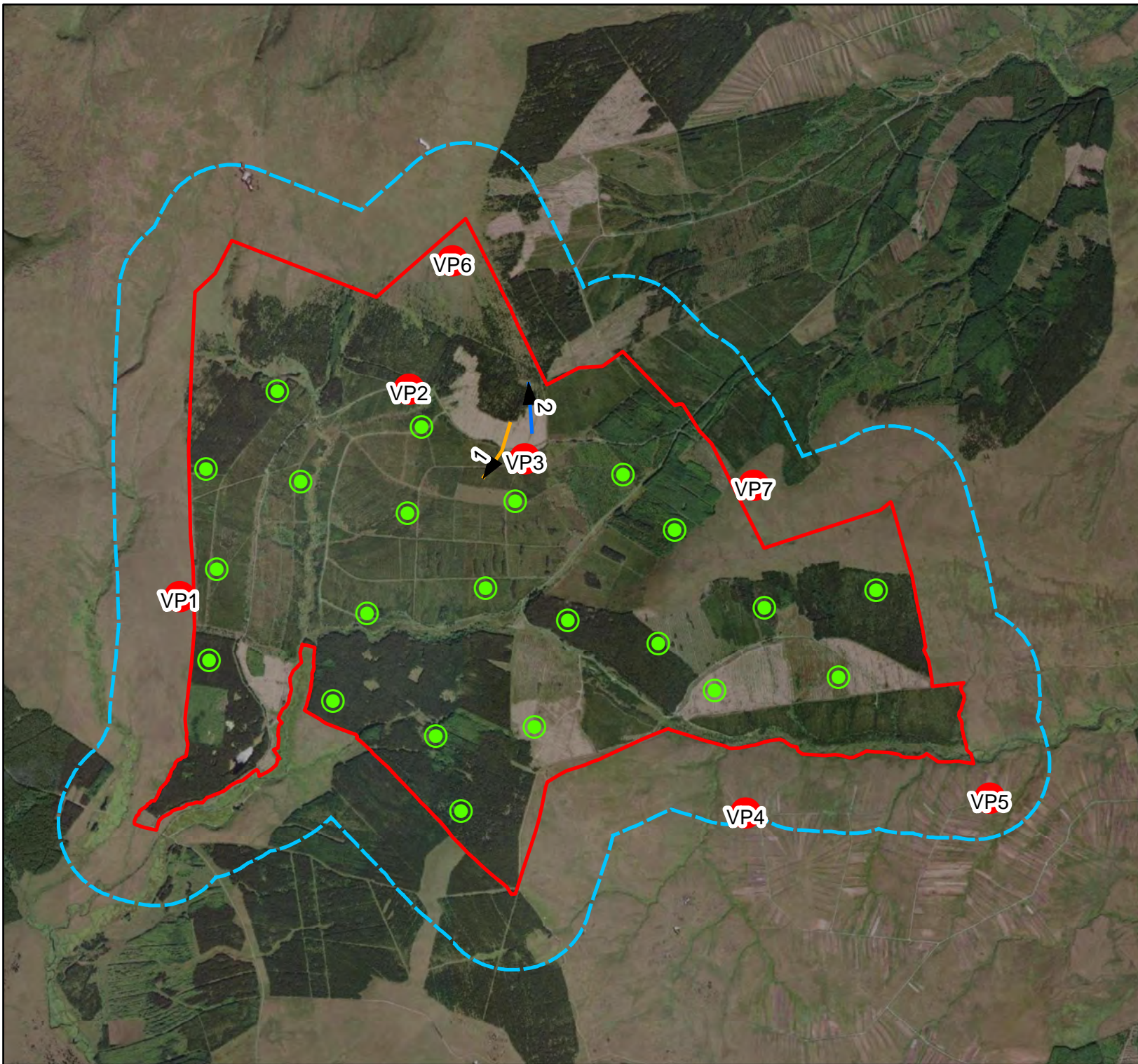
Client: SSE Renewables

Drawing Title:
 Map 6-1 Snipe

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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- Legend**
- Site Boundary
 - Vantage Point Locations
 - Flight Activity Survey Area 500m
 - Turbine Locations

Sparrowhawk Flight Path

- ▶ 1, 28/05/2021
- ▶ 2, 19/07/2021

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

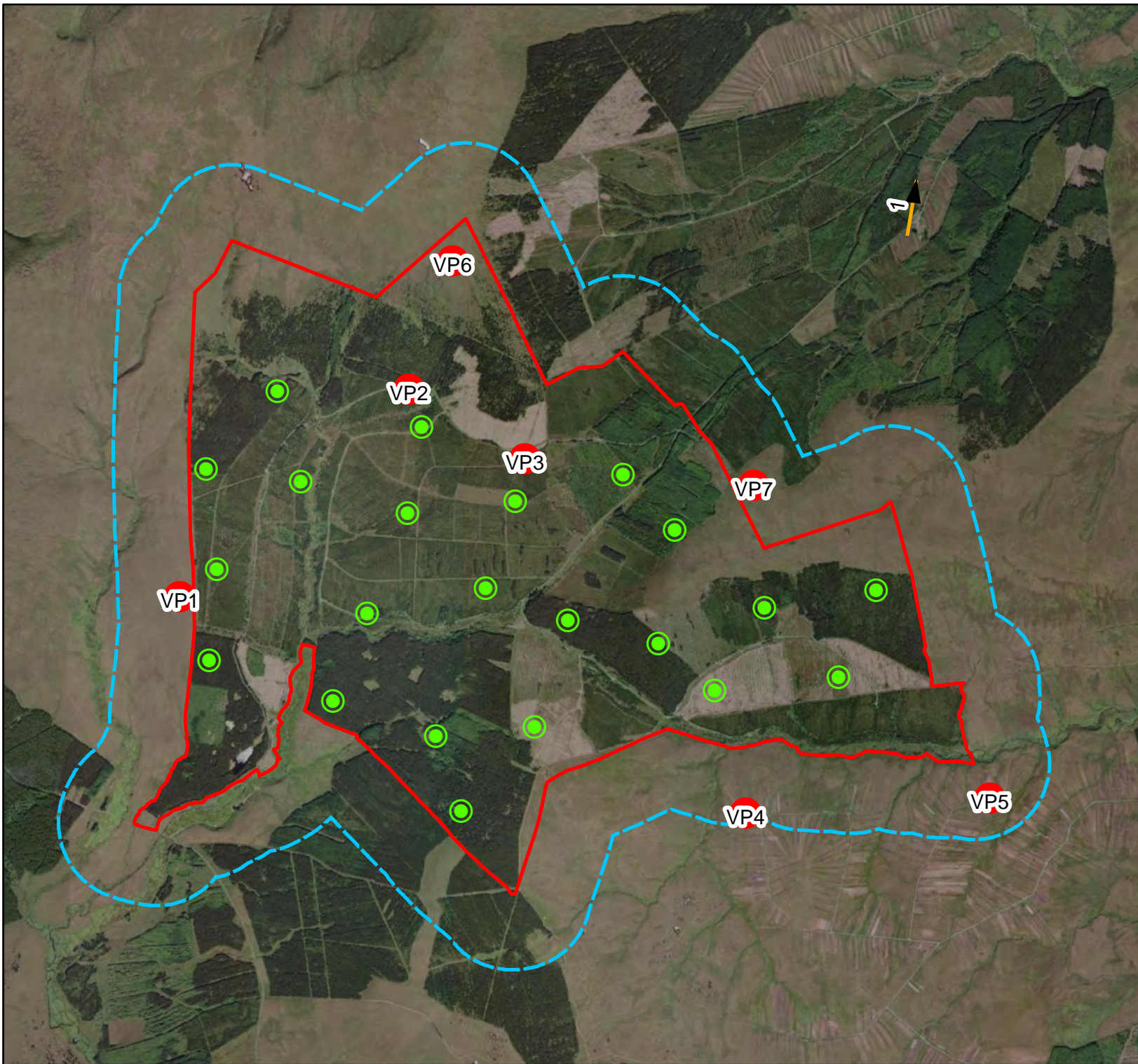
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Drawing Title:
 Map 7-1 Sparrowhawk

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Teal Flight Path

- ▶ 1, 14/09/2021

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2021 Breeding bird surveys

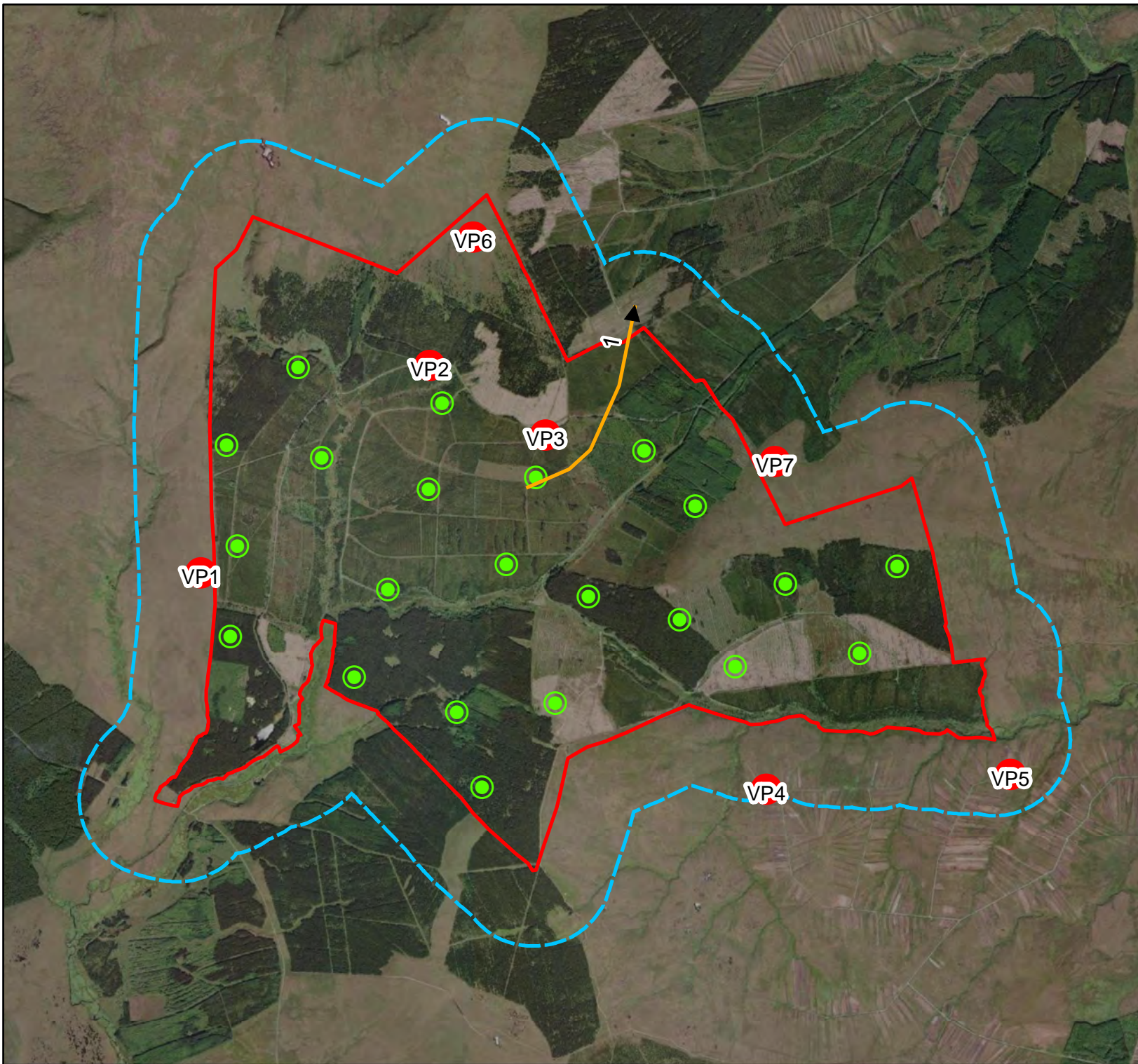
Client: SSE Renewables

Drawing Title:
 Map 8-1 Teal

Drawn: VH	Checked: DoB
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Date: 08/06/2023	Scale (A4): 1:35,000
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Legend

- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations
- Site Boundary

Cormorant Flight Path

➔ 1, 07/01/2022

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

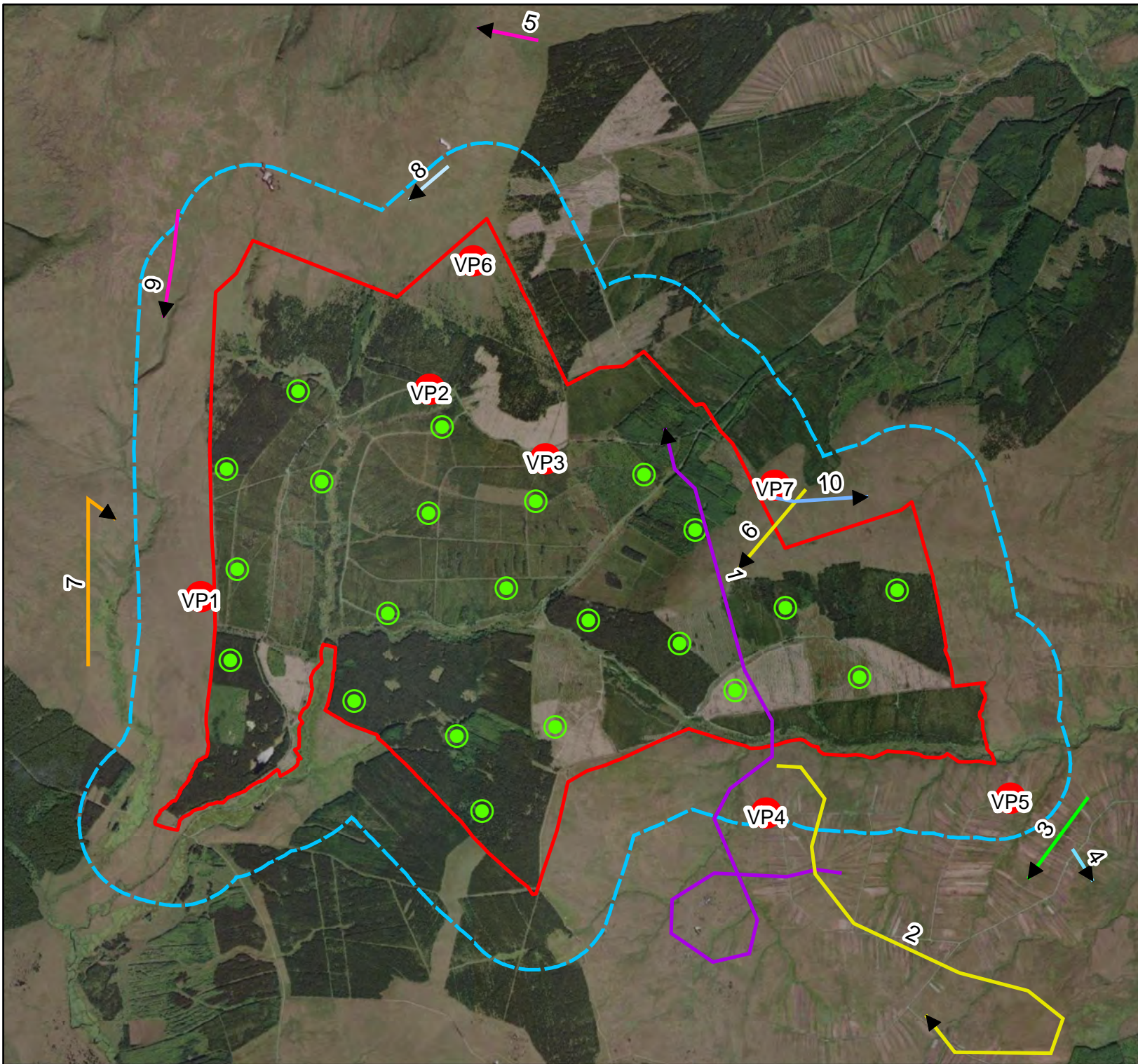
Client: SSE Renewables

Drawing Title:
 Map 1-1 Cormorant

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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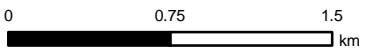
Legend

- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations
- Site Boundary

Golden Plover Flight Path

- 1, 12/10/2021
- 2, 12/10/2021
- 3, 13/10/2021
- 4, 13/10/2021
- 5, 14/10/2021
- 6, 14/10/2021
- 7, 15/10/2021
- 8, 15/10/2021
- 9, 15/10/2021
- 10, 15/10/2021

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Project Title: 21424 -
Glenora WF - Winter 2021/22 bird surveys

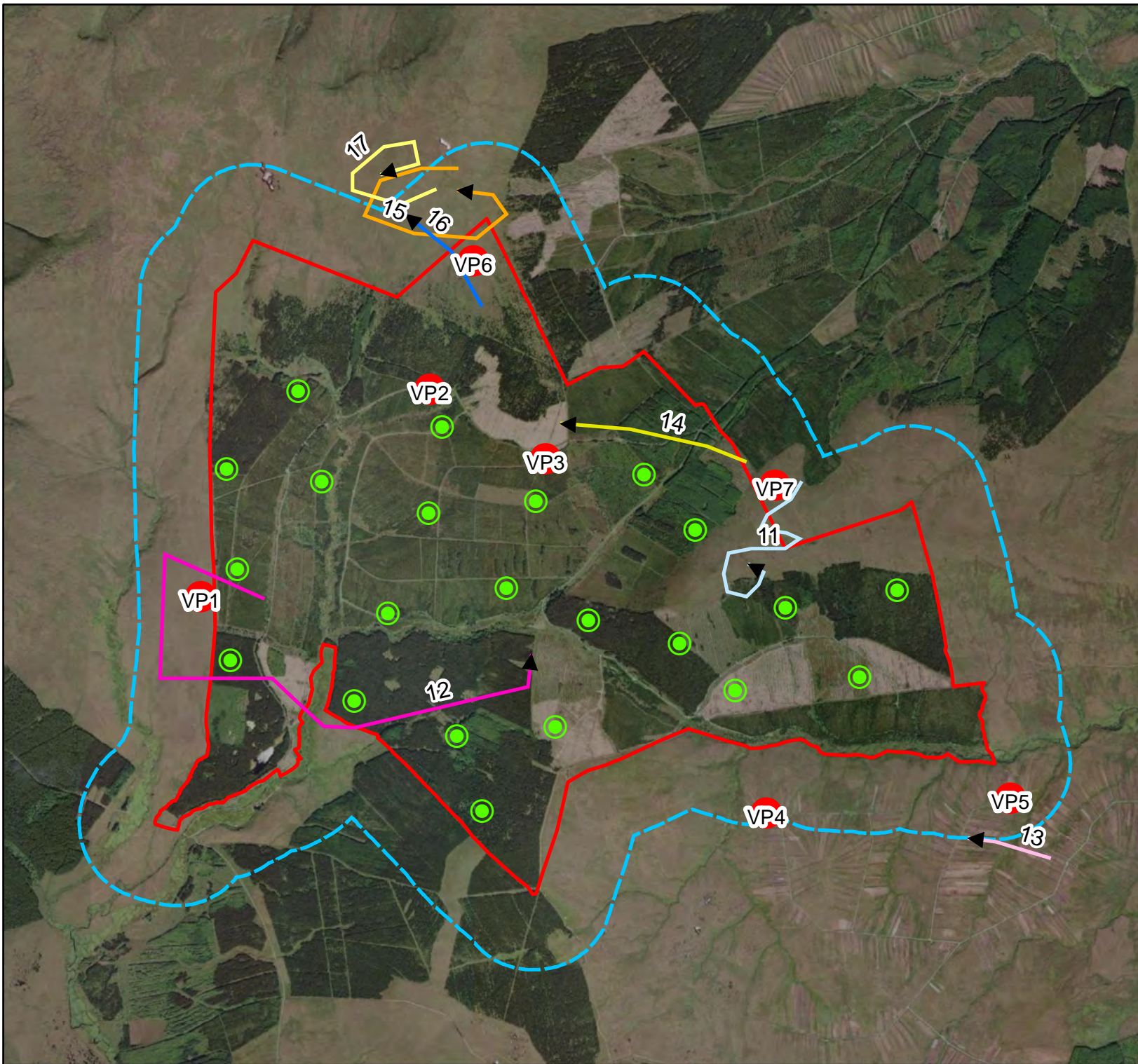
Client: SSE Renewables

Drawing Title:
Map 2-1 Golden Plover

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations
- Site Boundary

Golden Plover Flight Path

- ▶ 11, 15/10/2021
- ▶ 12, 16/11/2021
- ▶ 13, 08/12/2021
- ▶ 14, 09/12/2021
- ▶ 15, 09/12/2021
- ▶ 16, 09/12/2021
- ▶ 17, 10/12/2021

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0 0.75 1.5 km

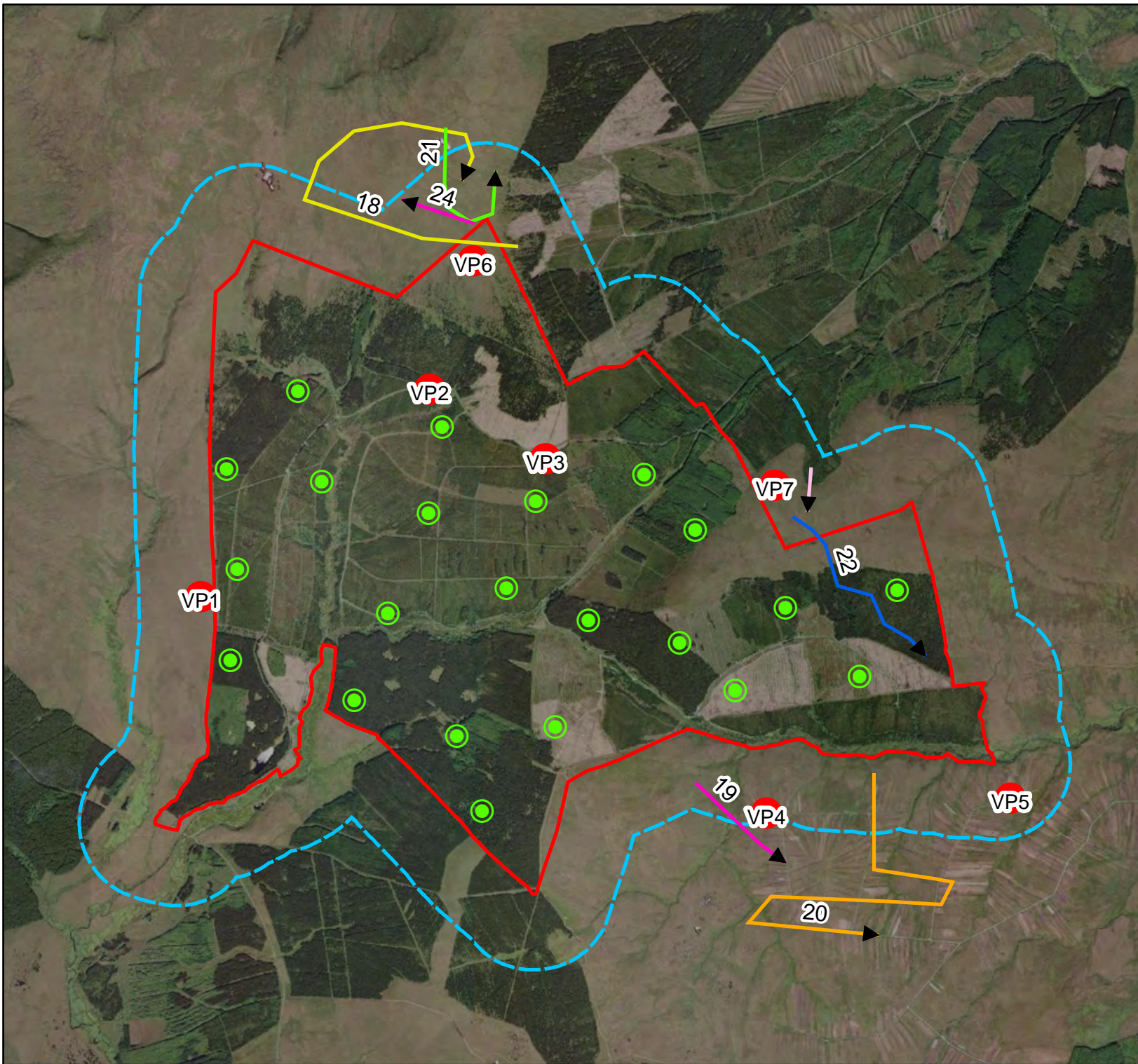
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 2-2 Golden Plover

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





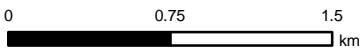
Legend

- Vantage Point Locations
- Flight Activity Survey Area
- Turbine Locations
- Site Boundary

Golden Plover Flight Path

- ▶ 18, 10/12/2021
- ▶ 19, 11/01/2022
- ▶ 20, 11/01/2022
- ▶ 21, 14/01/2022
- ▶ 22, 08/02/2022 (incidental)
- ▶ 23, 08/02/2022
- ▶ 24, 02/03/2022 (incidental)

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Project Title: 21424 -
Glenora WF - Winter 2021/22 bird surveys

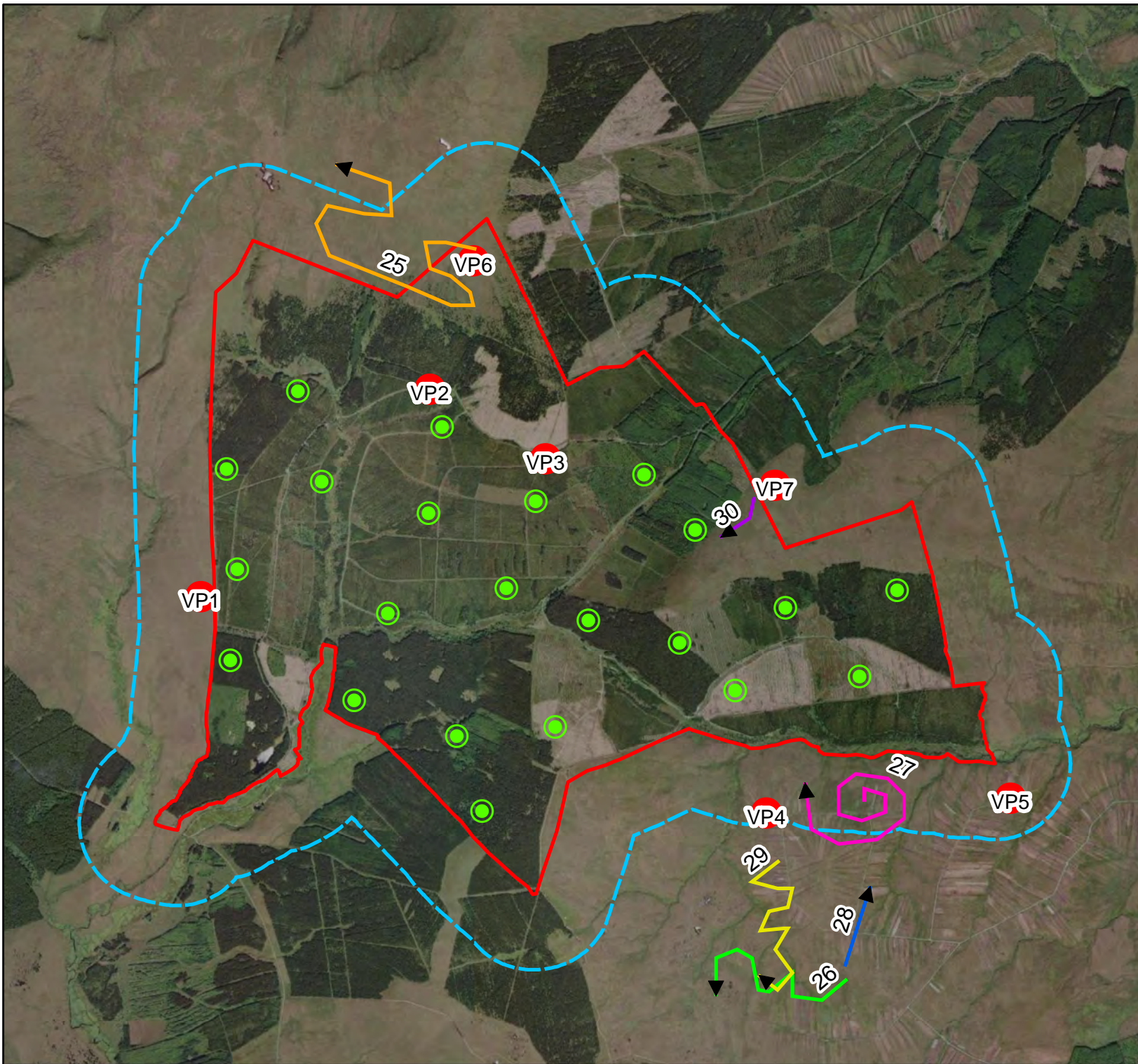
Client: SSE Renewables

Drawing Title:
Map 2-3 Golden Plover

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Golden Plover Flight Path

- ▶ 25, 03/03/2022
- ▶ 26, 09/03/2022 (incidental)
- ▶ 27, 11/03/2022
- ▶ 28, 11/03/2022
- ▶ 29, 11/03/2022
- ▶ 30, 23/03/2022

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0 0.75 1.5 km

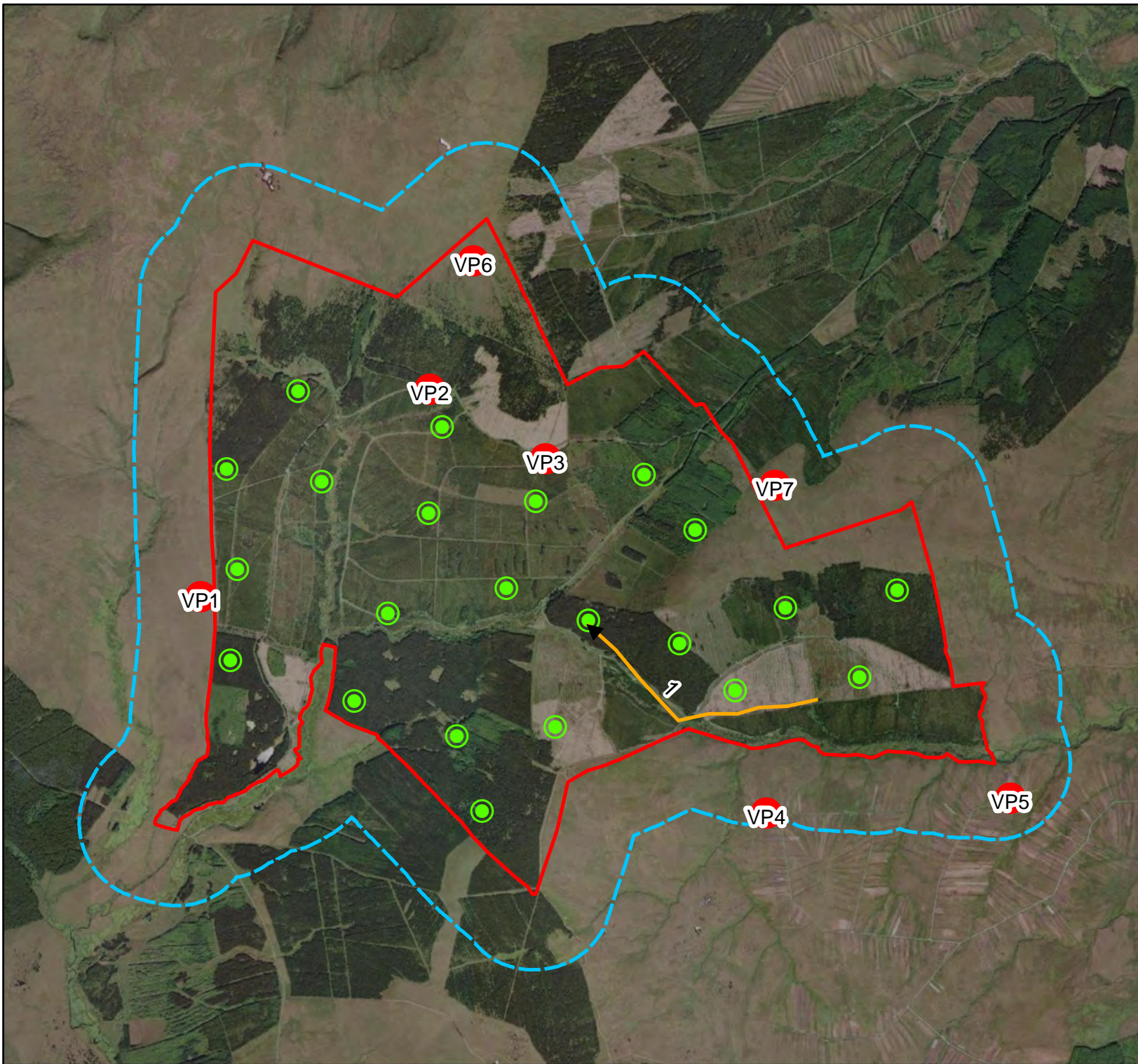
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 2-4 Golden Plover

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





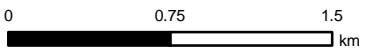
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Great Black-backed Gull Flight Path

→ 1, 09/03/2022

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Glenora WF - Winter 2021/22 bird surveys

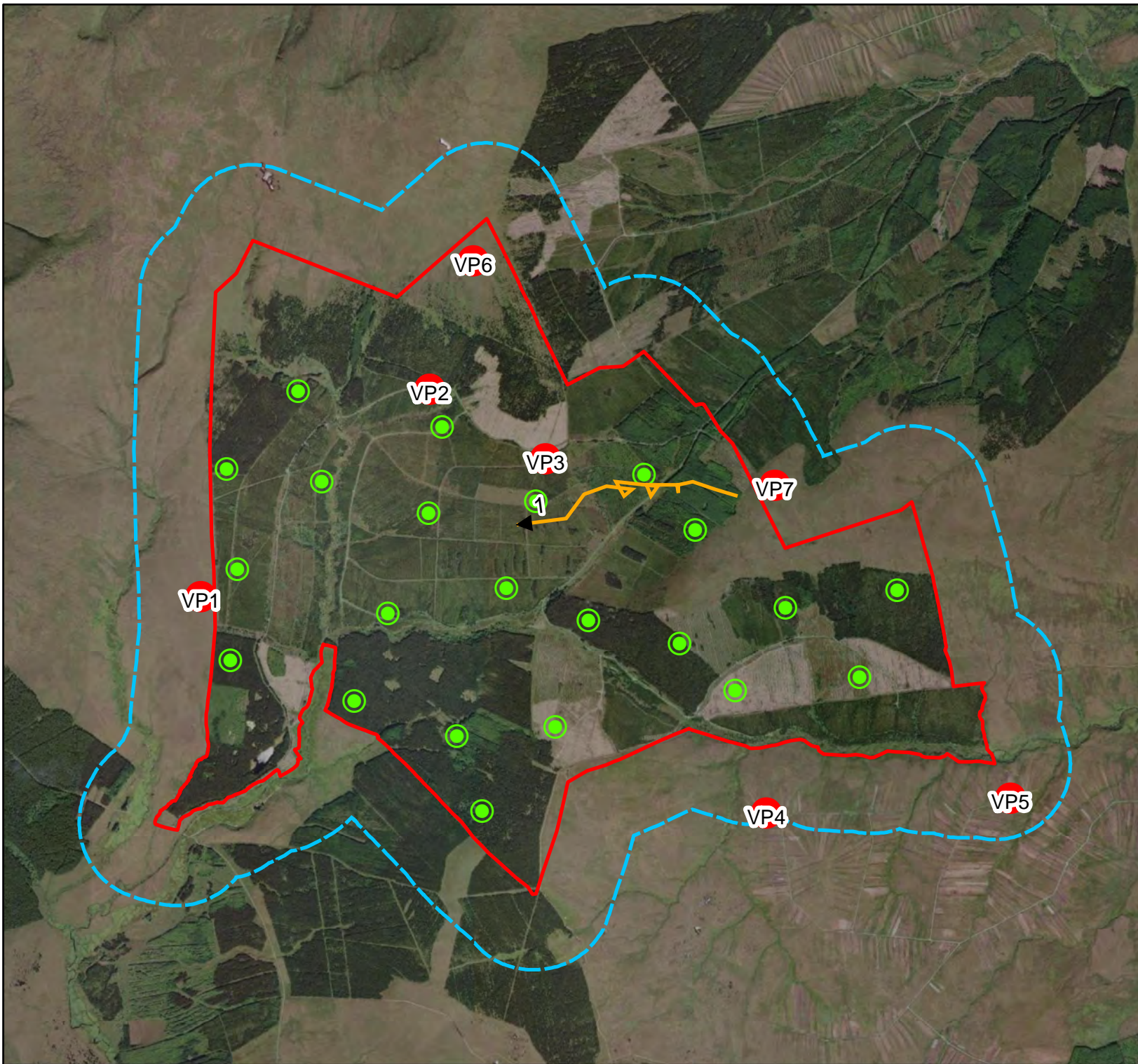
Client: SSE Renewables

Drawing Title:
Map 3-1 Great Black-backed Gull

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend


- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Hen Harrier Flight Path

- 1, 10/02/2022

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0 0.75 1.5 km



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 Glenora WF - Winter 2021/22 bird surveys

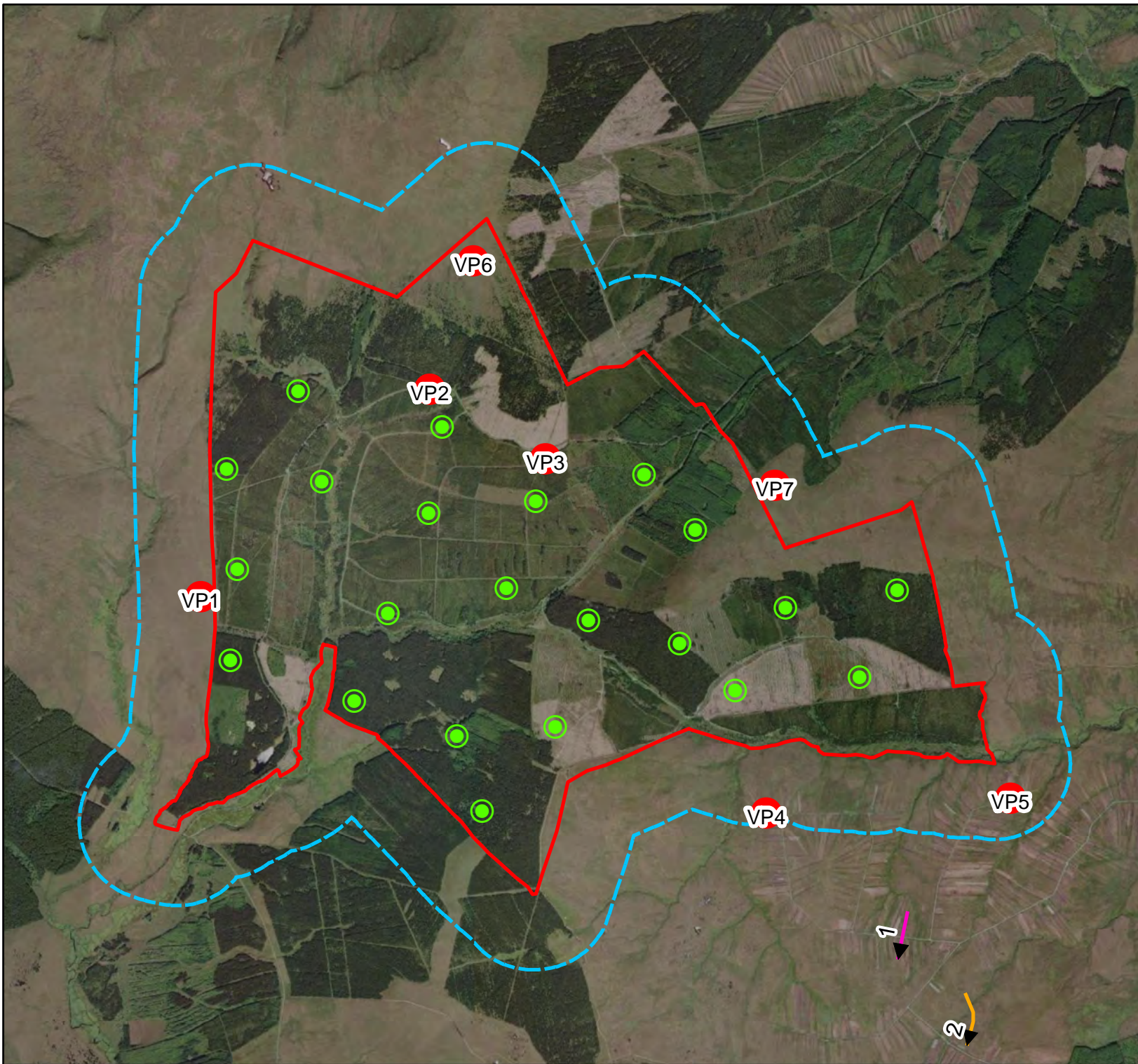
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Drawing Title:
 Map 4-1 Hen Harrier

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend


- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Jack Snipe Flight Path

- 1, 13/01/2022
- 2, 13/01/2022

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0 0.75 1.5 km



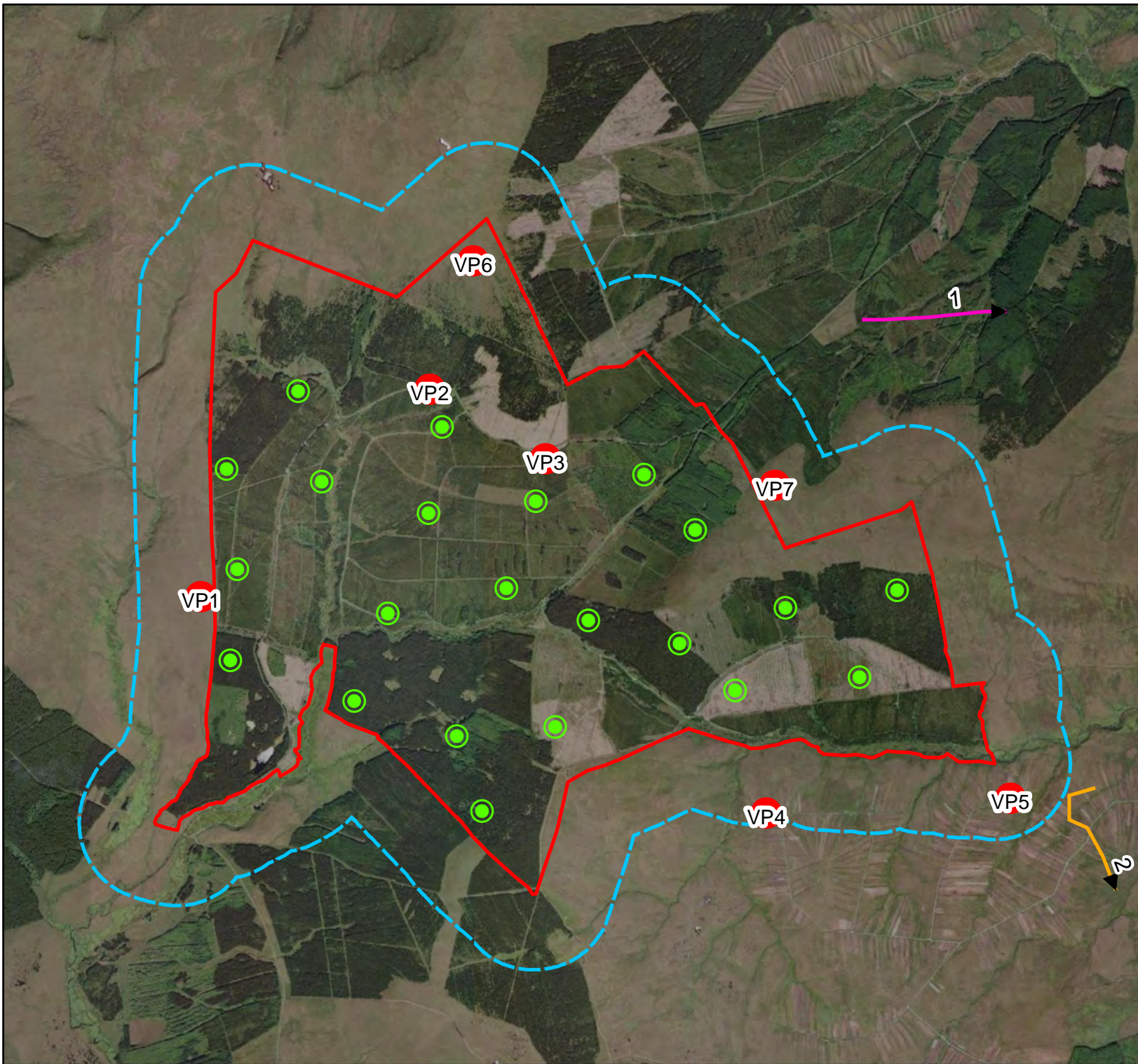
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 5-1 Jack Snipe

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Mallard Flight Path

- ➔ 1, 15/02/2022
- ➔ 2, 09/03/2022

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0 0.75 1.5 km

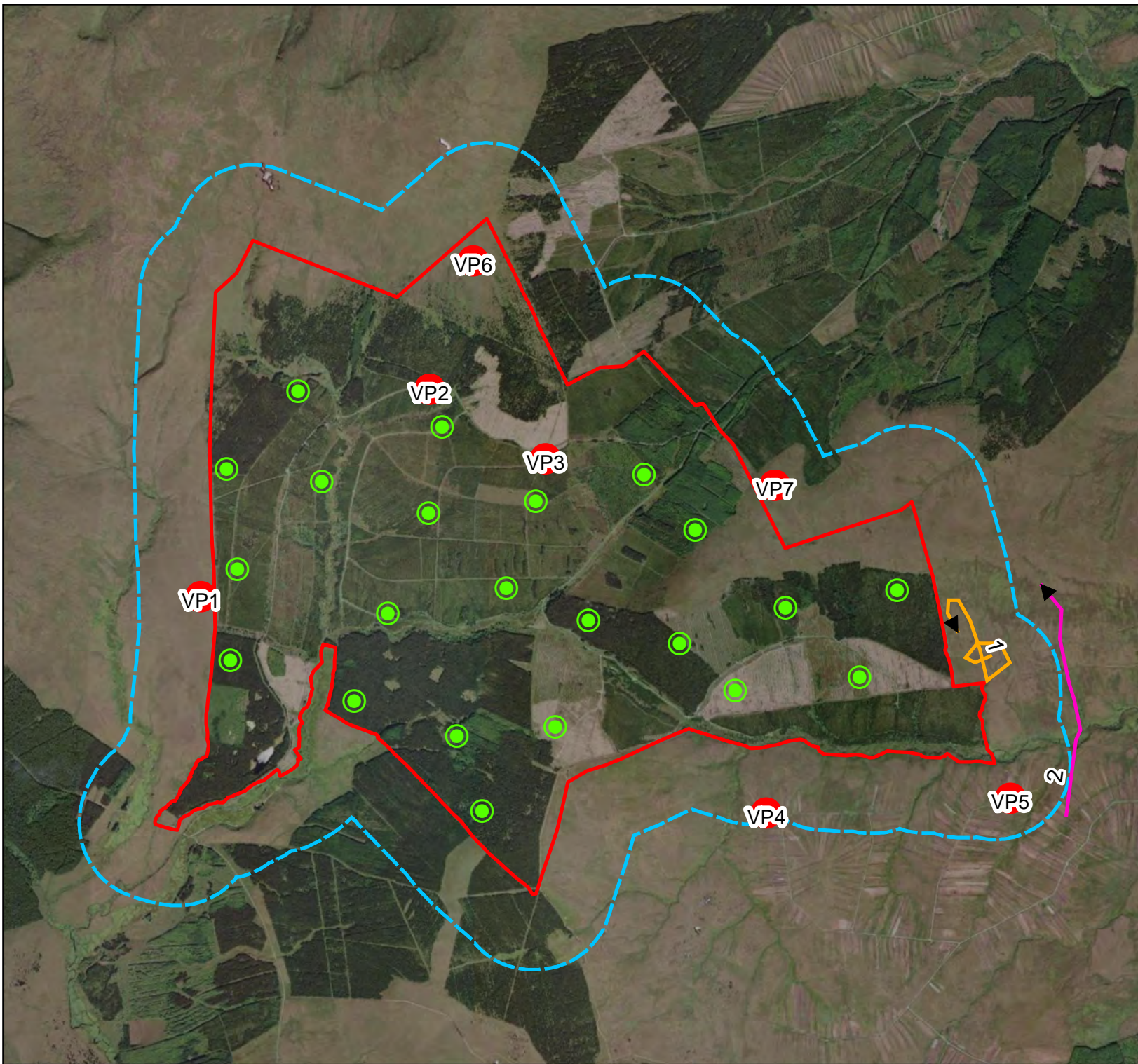
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 6-1 Mallard

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





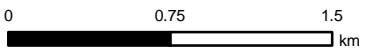
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Peregrine Flight Path

- ▶ 1, 13/10/2021
- ▶ 2, 11/01/2022

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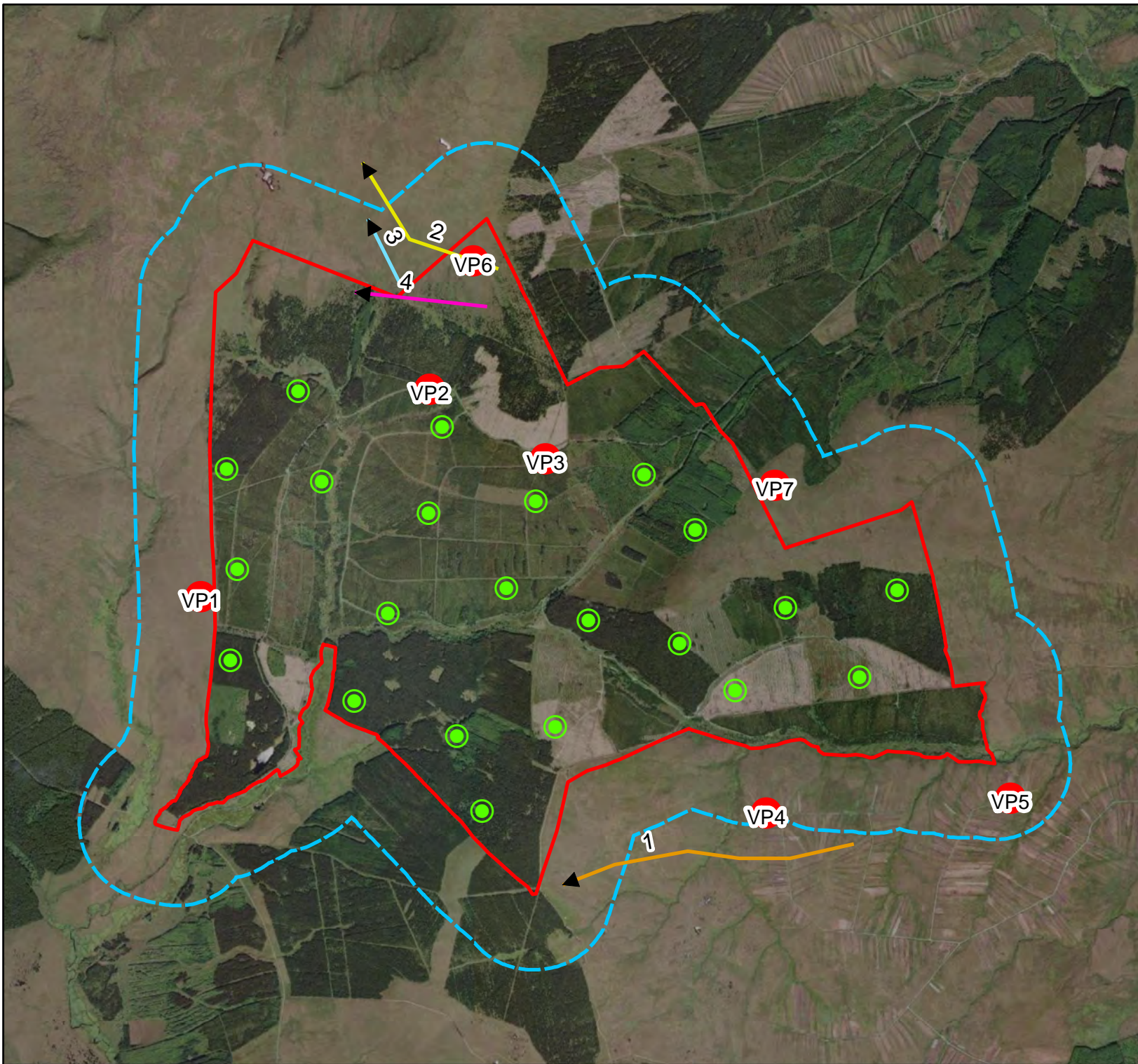
Client: SSE Renewables

Drawing Title:
Map 7-1 Peregrine

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Snipe Flight Path

- ▶ 1, 12/10/2021
- ▶ 2, 14/10/2021
- ▶ 3, 14/10/2021
- ▶ 4, 14/10/2021

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0 0.75 1.5 km

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 Glenora WF - Winter 2021/22 bird surveys

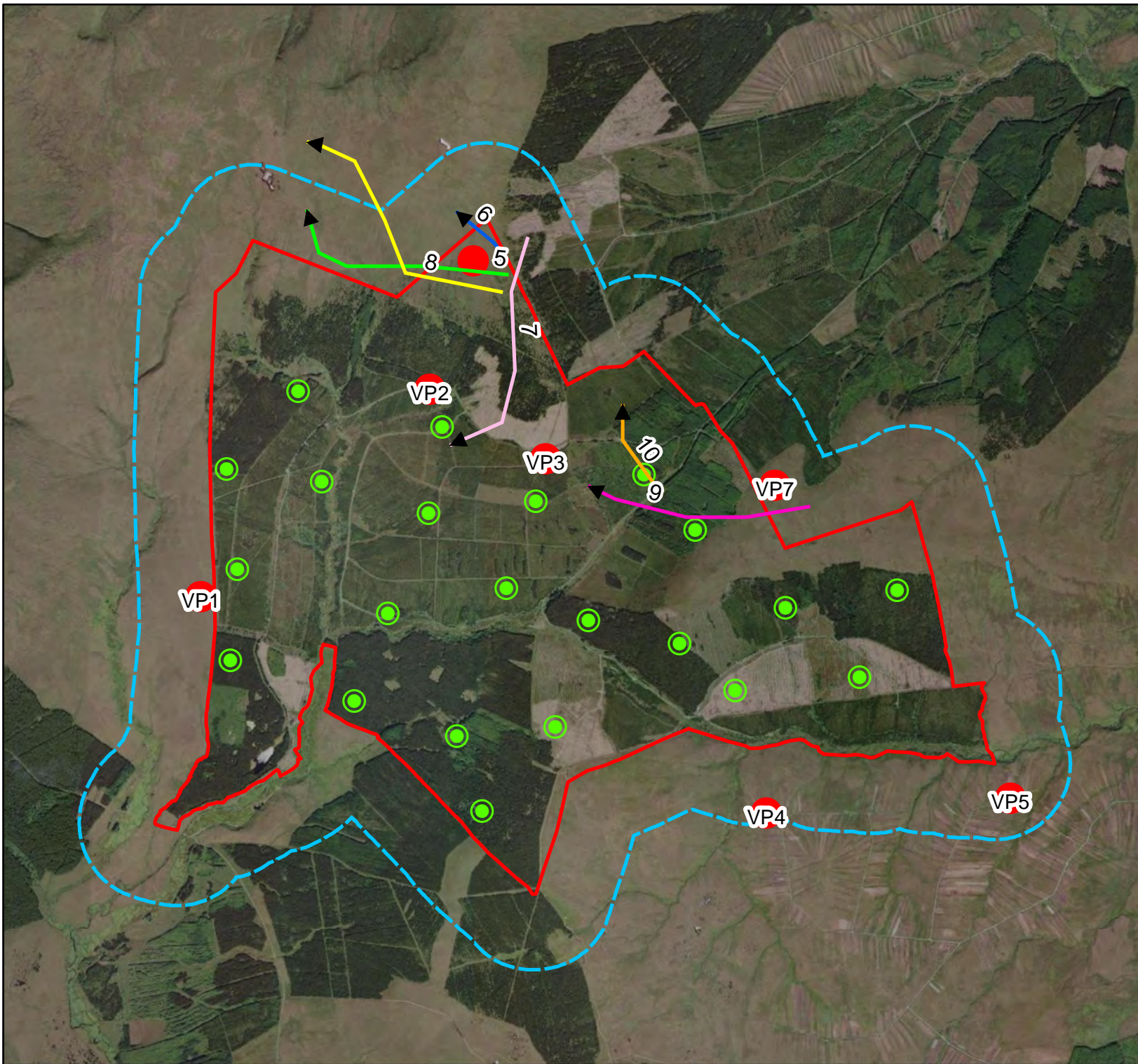
Client: SSE Renewables

Drawing Title:
 Map 8-1 Snipe

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Snipe Flight Path

- ▶ 5, 14/10/2021
- ▶ 6, 14/10/2021
- ▶ 7, 14/10/2021
- ▶ 8, 14/10/2021
- ▶ 9, 15/10/2021
- ▶ 10, 15/10/2021

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0 0.75 1.5 km

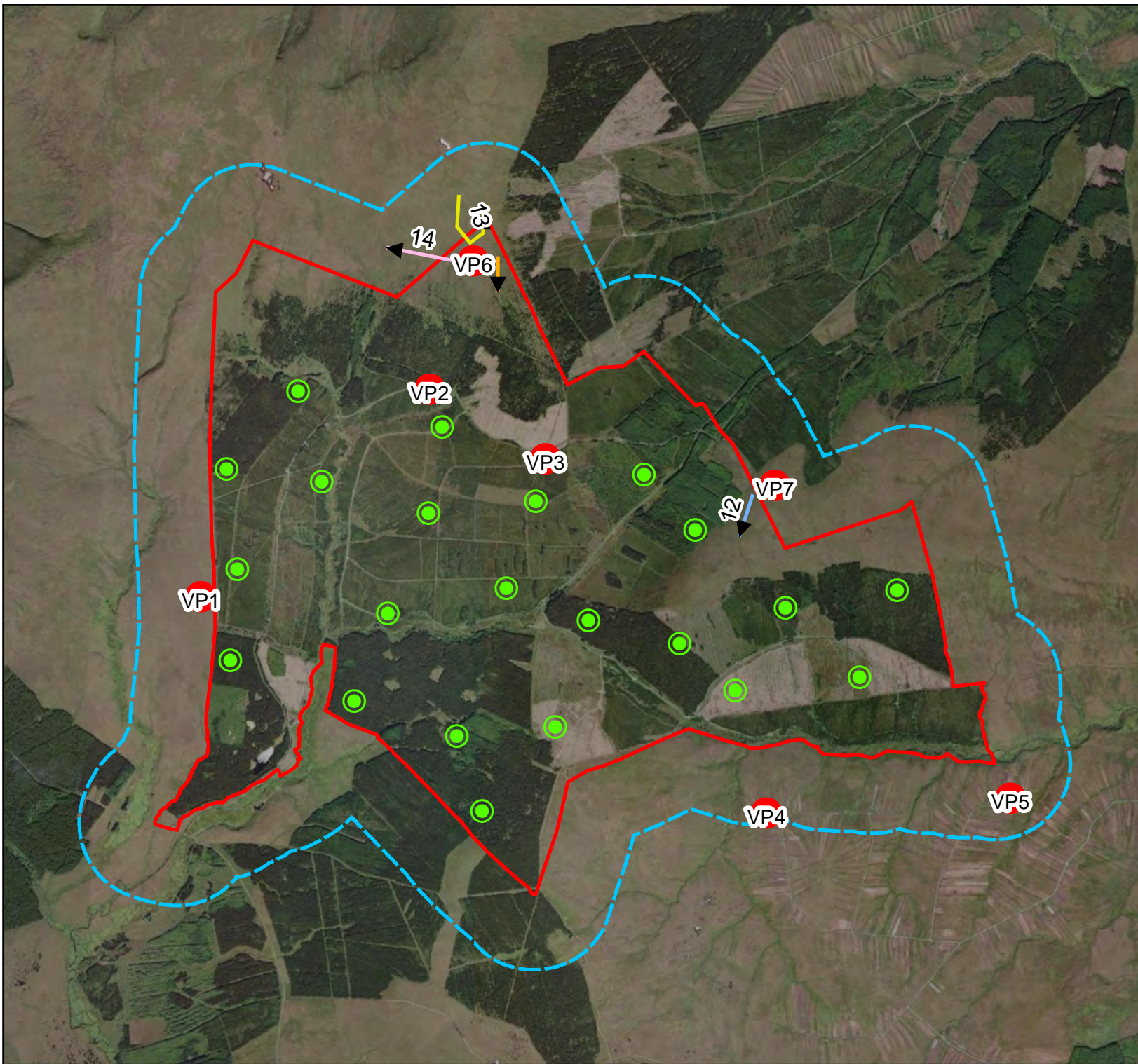
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 8-2 Snipe

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Snipe Flight Path

- ▶ 11, 10/12/2021
- ▶ 12, 10/12/2021 (incidental)
- ▶ 13, 14/01/2022
- ▶ 14, 14/01/2022

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0 0.75 1.5 km

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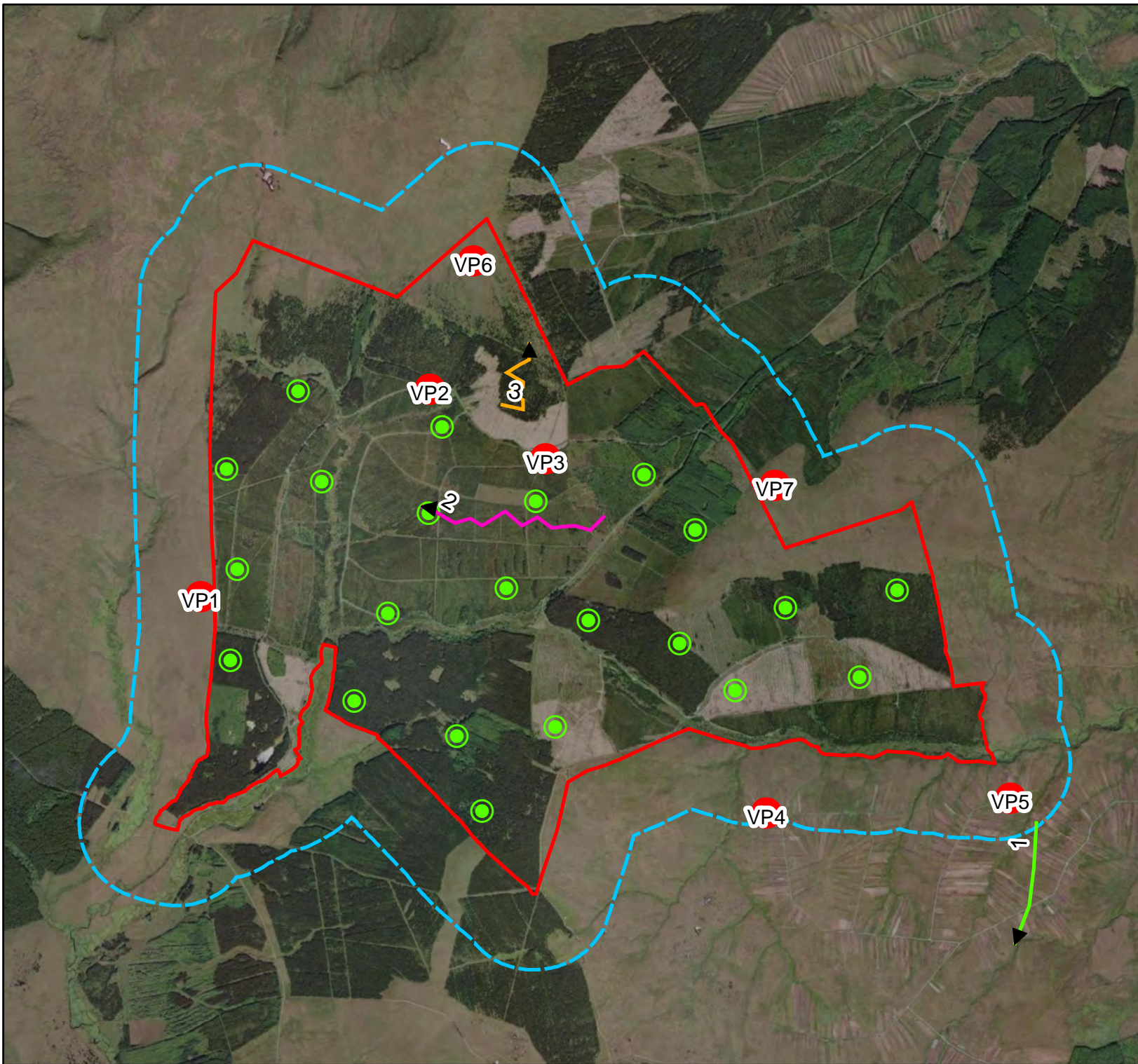
Client: SSE Renewables

Drawing Title:
 Map 8-3 Snipe

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Sparrowhawk Flight Path

- ▶ 1, 12/10/2021
- ▶ 2, 14/10/2021
- ▶ 3, 01/03/2022

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 CYAL50261645.

0 0.75 1.5 km

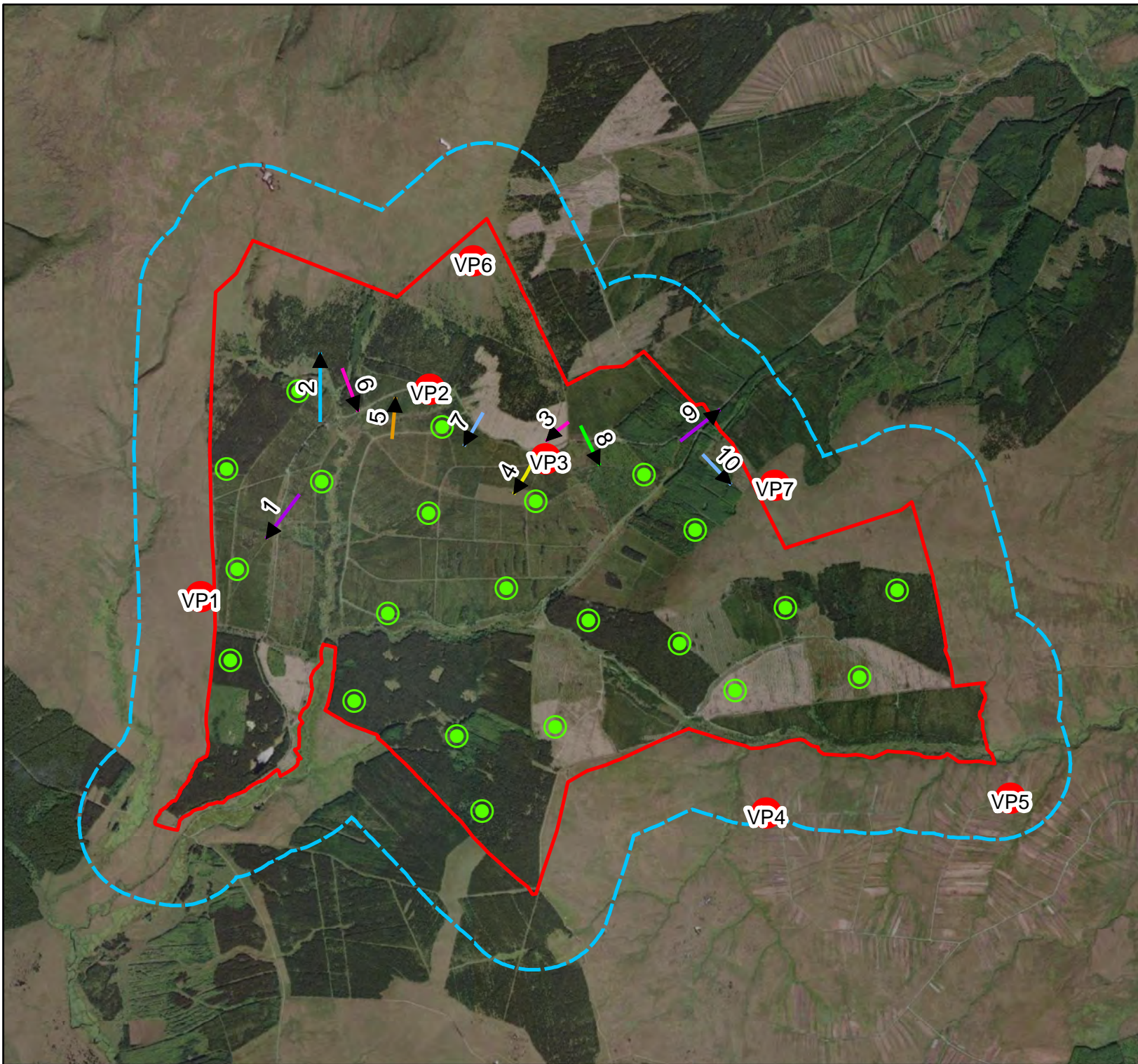
Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
 Map 9-1 Sparrowhawk

Drawn: VH	Checked: DoB
Date: 09/06/2023	Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Woodcock Flight Path

- 1, 09/12/2021 (incidental)
- 2, 09/12/2021 (incidental)
- 3, 10/12/2021
- 4, 10/12/2021
- 5, 13/12/2021
- 6, 07/02/2022 (incidental)
- 7, 07/02/2022 (incidental)
- 8, 07/02/2022 (incidental)
- 9, 07/02/2022 (incidental)
- 10, 07/02/2022 (incidental)

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - Winter 2021/22 bird surveys

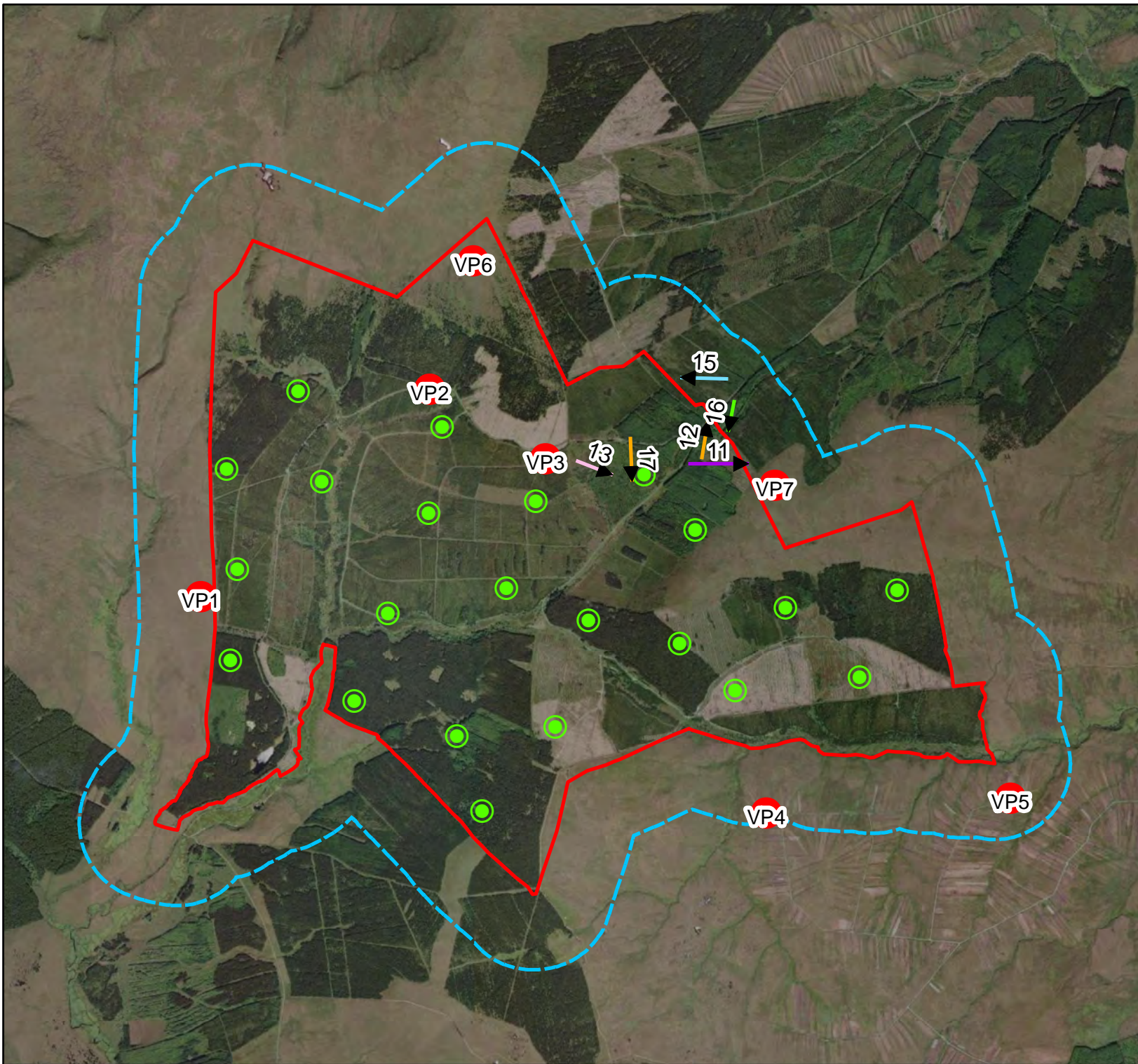
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Drawing Title:
 Map 10-1 Woodcock

Drawn: VH	Checked: DoB
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Date: 09/06/2023	Scale (A4): 1:35,000
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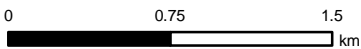
Legend

- Vantage Point Locations
- - - Flight Activity Survey Area 500m
- Turbine Locations
- ▭ Site Boundary

Woodcock Flight Path

- ▶ 11, 08/02/2022 (incidental)
- ▶ 12, 08/02/2022 (incidental)
- ▶ 13, 01/03/2022 (incidental)
- ▶ 14, 03/03/2022 (incidental)
- ▶ 15, 09/03/2022 (incidental)
- ▶ 16, 09/03/2022 (incidental)
- ▶ 17, 09/03/2022 (incidental)

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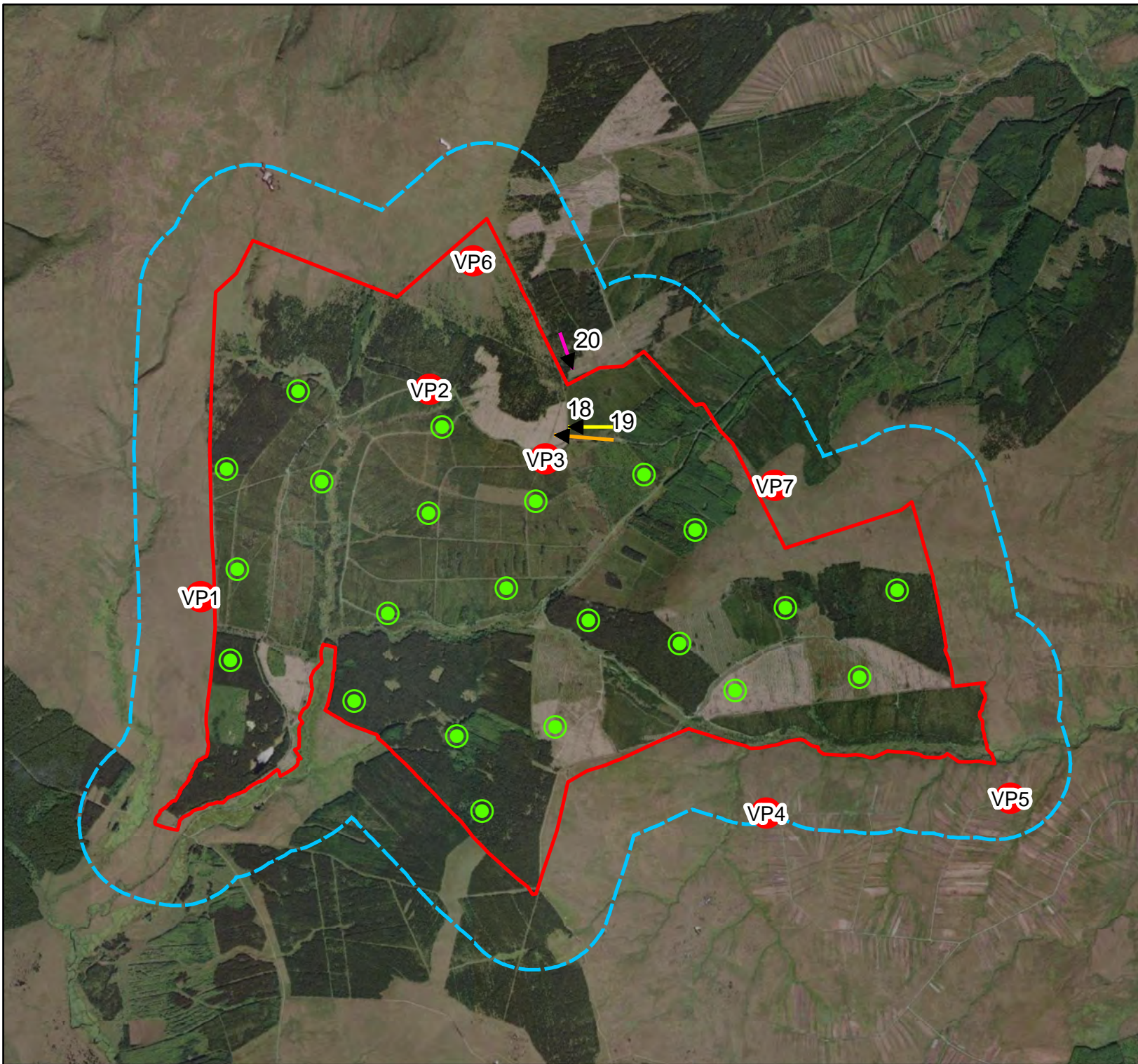
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Drawing Title:
Map 10-2 Woodcock

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





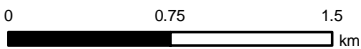
Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Woodcock Flight Path

- ▶ 18, 09/03/2022 (incidental)
- ▶ 19, 09/03/2022 (incidental)
- ▶ 20, 11/03/2022 (incidental)

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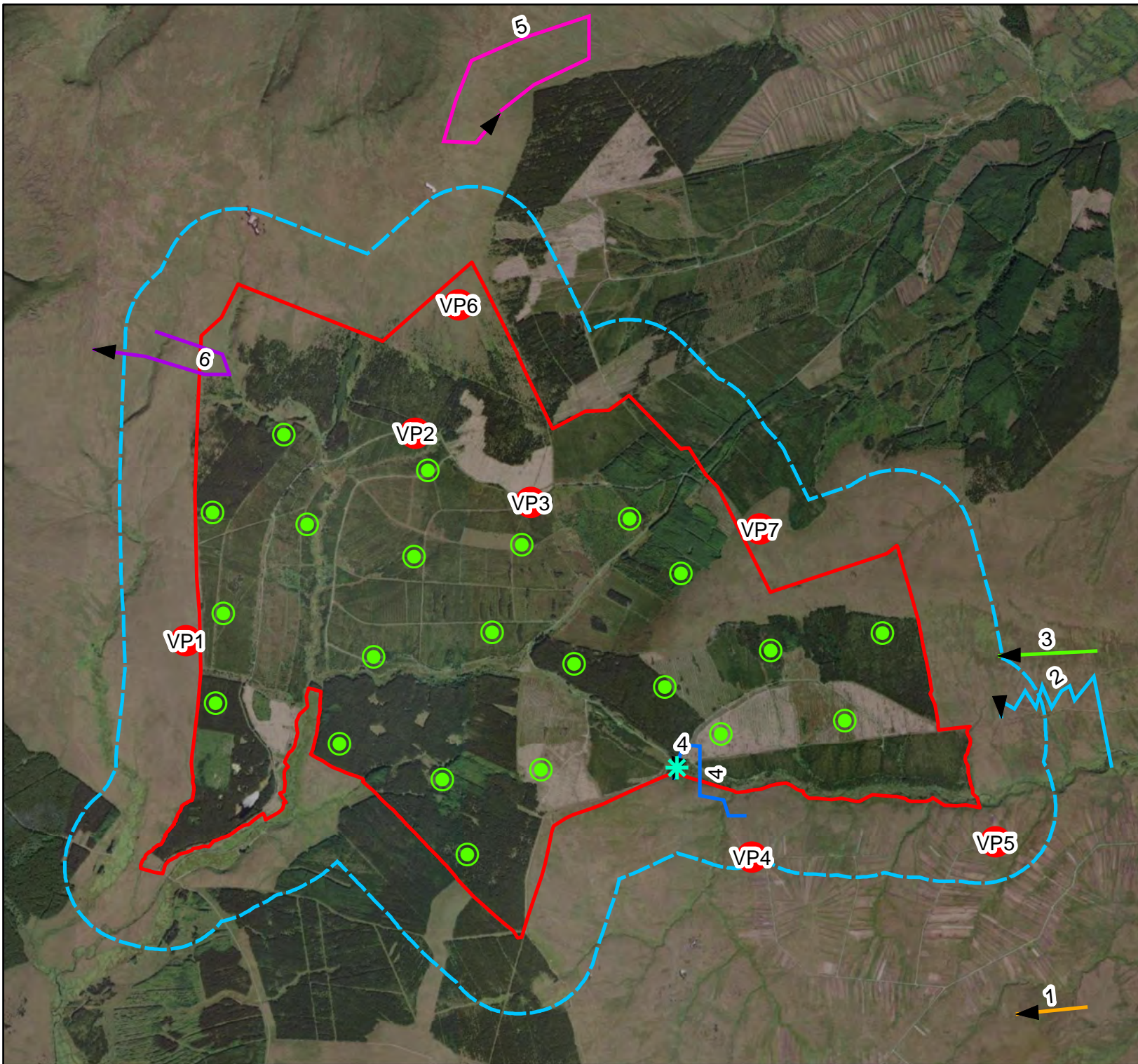
Client: SSE Renewables

Drawing Title:
Map 10-3 Woodcock

Drawn: VH Checked: DoB

Date: 09/06/2023 Scale (A4): 1:35,000





Legend

- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations
- Site Boundary

Kestrel Perched

- ✱ 4, 13/10/2021

Kestrel Flight Path

- ▶ 1, 12/10/2021
- ▶ 2, 13/10/2021
- ▶ 3, 13/10/2021
- ▶ 4, 13/10/2021
- ▶ 5, 15/10/2021
- ▶ 6, 09/11/2021

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0 0.75 1.5 km

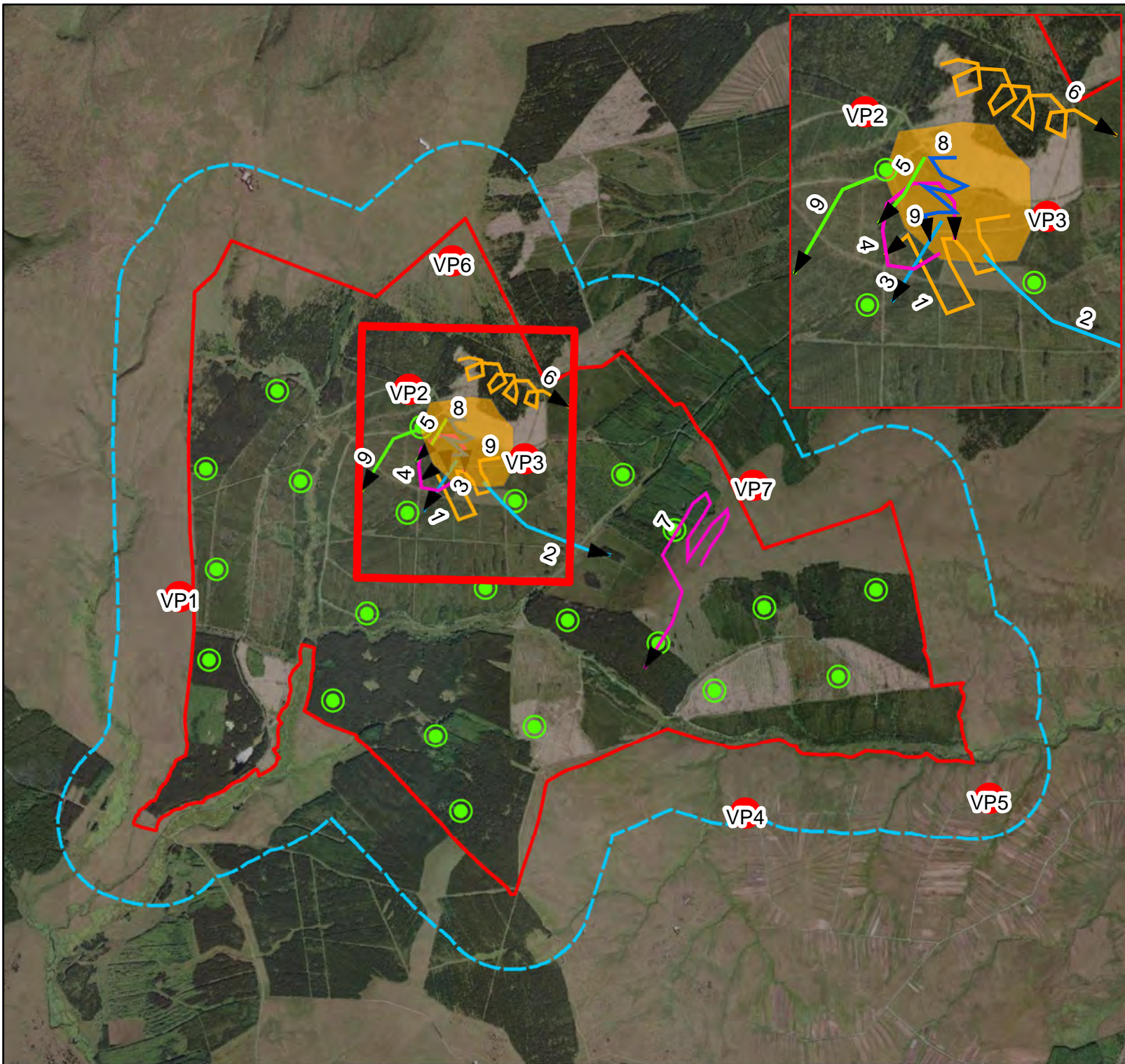
Project Title: 21424 -
Glenora WF - Winter 2021/22 bird surveys

Client: SSE Renewables

Drawing Title:
Map 11-1 Kestrel

Drawn: VH	Checked: HD
Date: 30/08/2023	Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

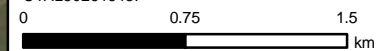
Buzzard Flight Path

- ▶ 1, 13/04/2022
- ▶ 2, 13/06/2022, *incidental
- ▶ 3, 13/06/2022, *incidental
- ▶ 4, 13/06/2022
- ▶ 5, 13/06/2022, *incidental
- ▶ 6, 08/07/2022
- ▶ 7, 08/07/2022
- ▶ 8, 29/07/2022
- ▶ 9, 29/07/2022

Buzzard Activity

- 9, 29/07/2022

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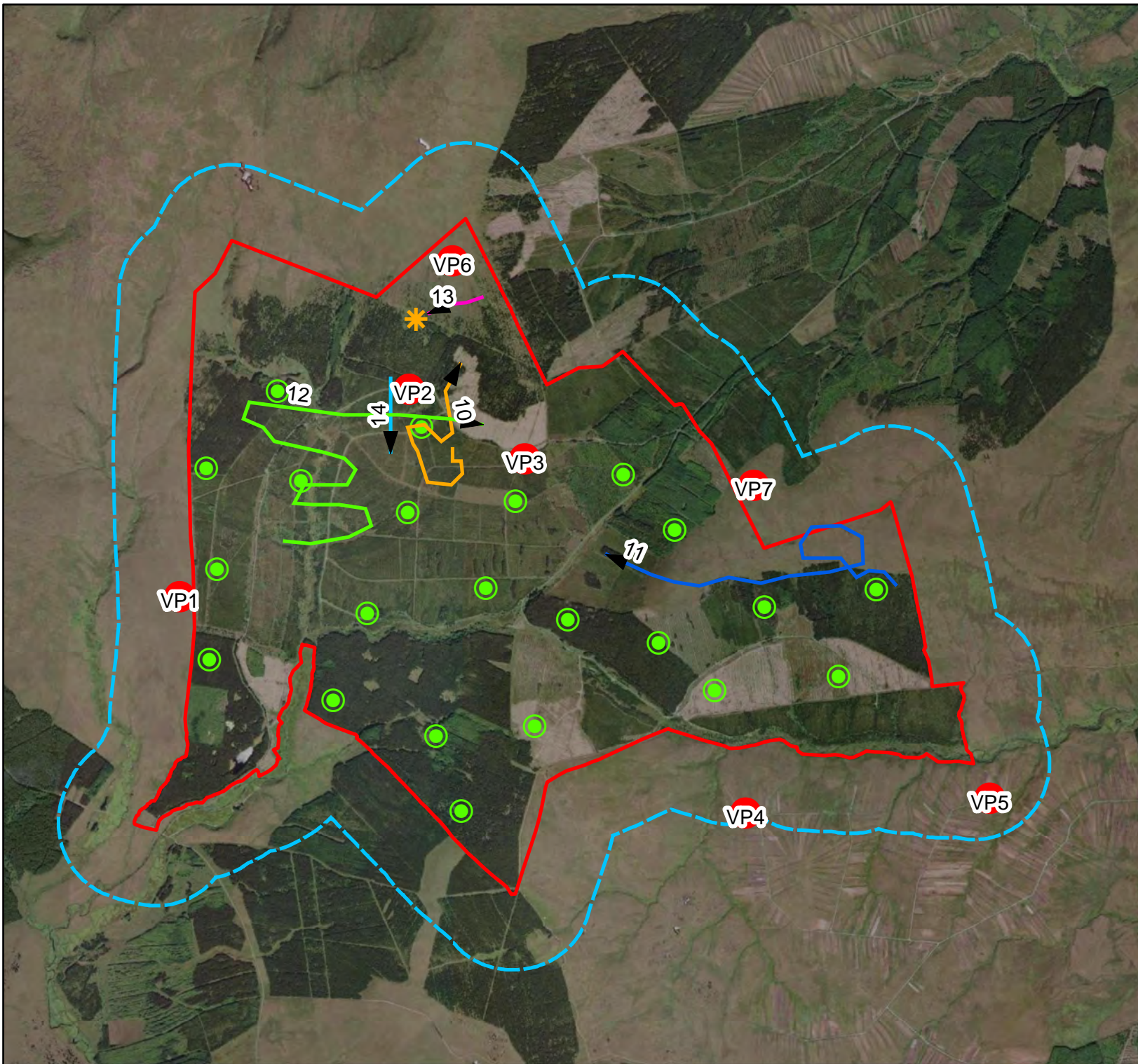
Client: SSE Renewables

Drawing Title:
Map 1-1 Buzzard

Drawn: VH Checked: DoB

Date: 25/05/2023 Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Buzzard Flight Path

- ▶ 10, 04/08/2022
- ▶ 11, 09/08/2022
- ▶ 12, 11/08/2022
- ▶ 13, 11/08/2022
- ▶ 14, 22/08/2021

Buzzard Perched

- ✱ 13, 11/08/2022

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0 0.75 1.5 km

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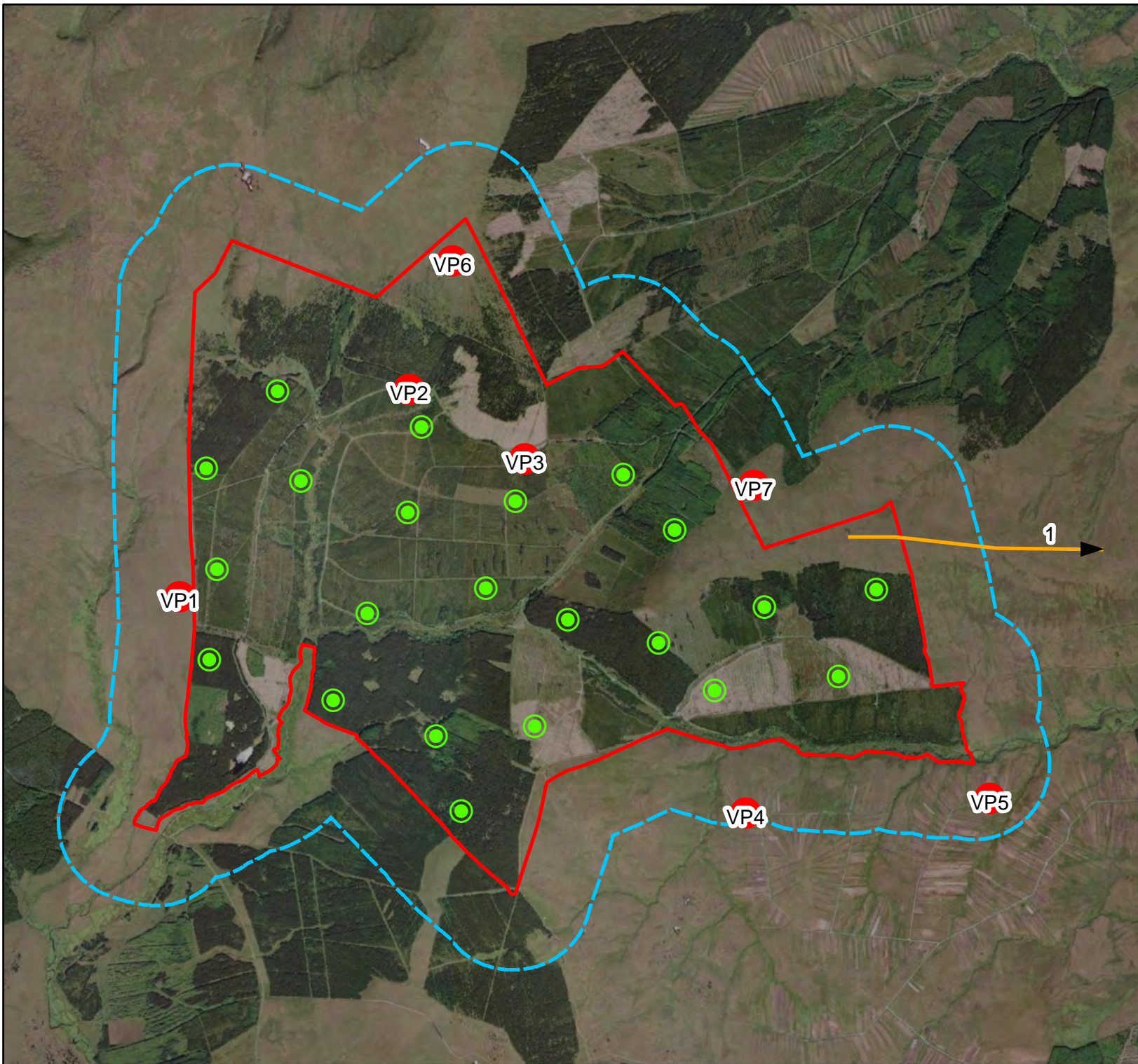
Client: SSE Renewables

Drawing Title:
 Map 1-2 Buzzard

Drawn: VH	Checked: DoB
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Date: 25/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Cormorant Flight Path

- ▶ 1, 10/08/2022

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
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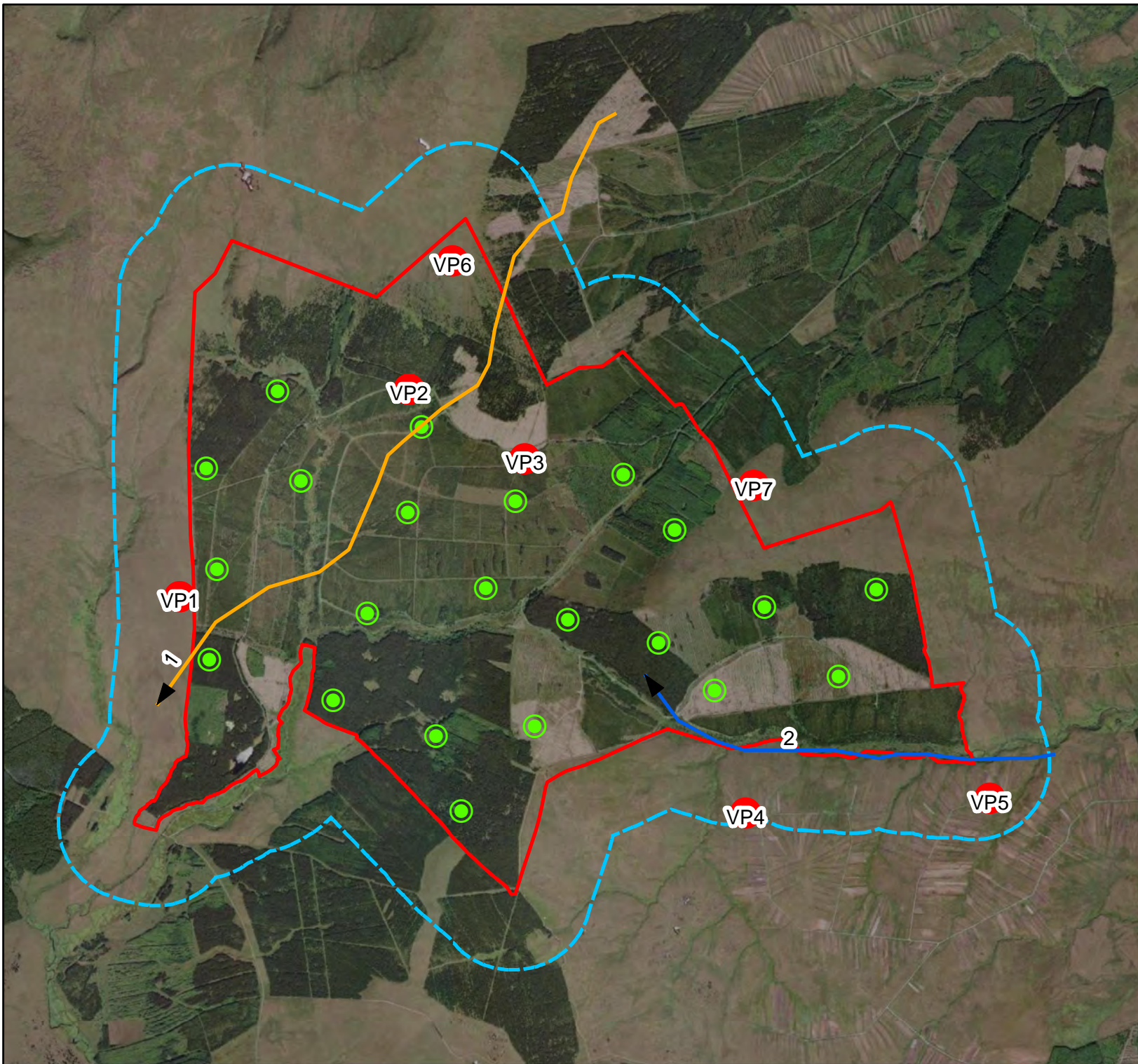
Client: SSE Renewables

Drawing Title:
 Map 2-1 Cormorant

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Great Black-Backed Gull Flight Path

- ▶ 1, 01/04/2022
- ▶ 2, 05/07/2022

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2022 Breeding bird surveys

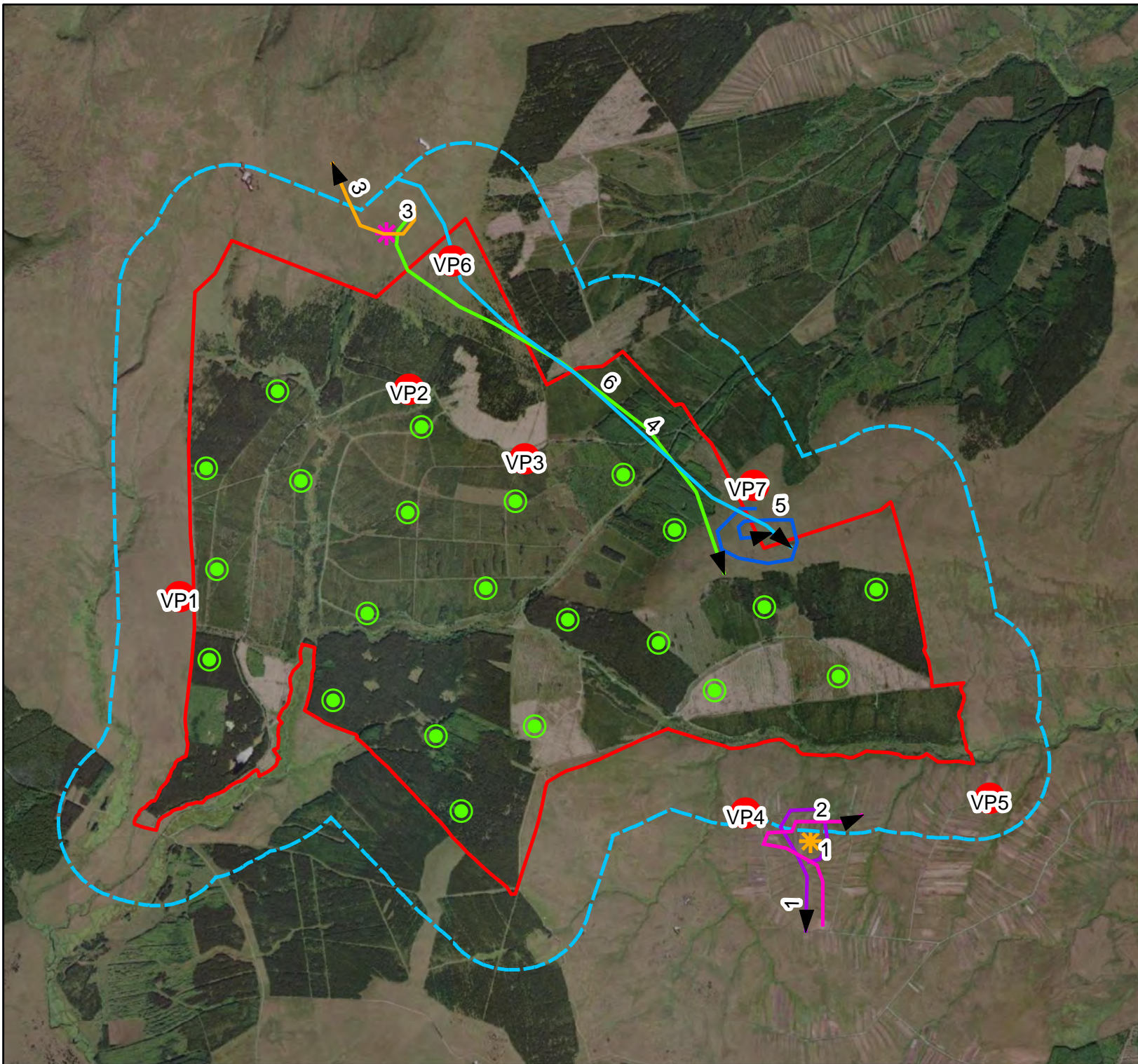
Client: SSE Renewables

Drawing Title:
 Map 3-1 Great Black-Backed Gull Flight Path

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Golden Plover Perched

- ✱ 1, 04/04/2022
- ✱ 3, 07/04/2022

Golden Plover Flight Path

- ▶ 1, 04/04/2022
- ▶ 2, 04/04/2022
- ▶ 3, 07/04/2022
- ▶ 4, 07/04/2022
- ▶ 5, 14/04/2022
- ▶ 6, 14/04/2022

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CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
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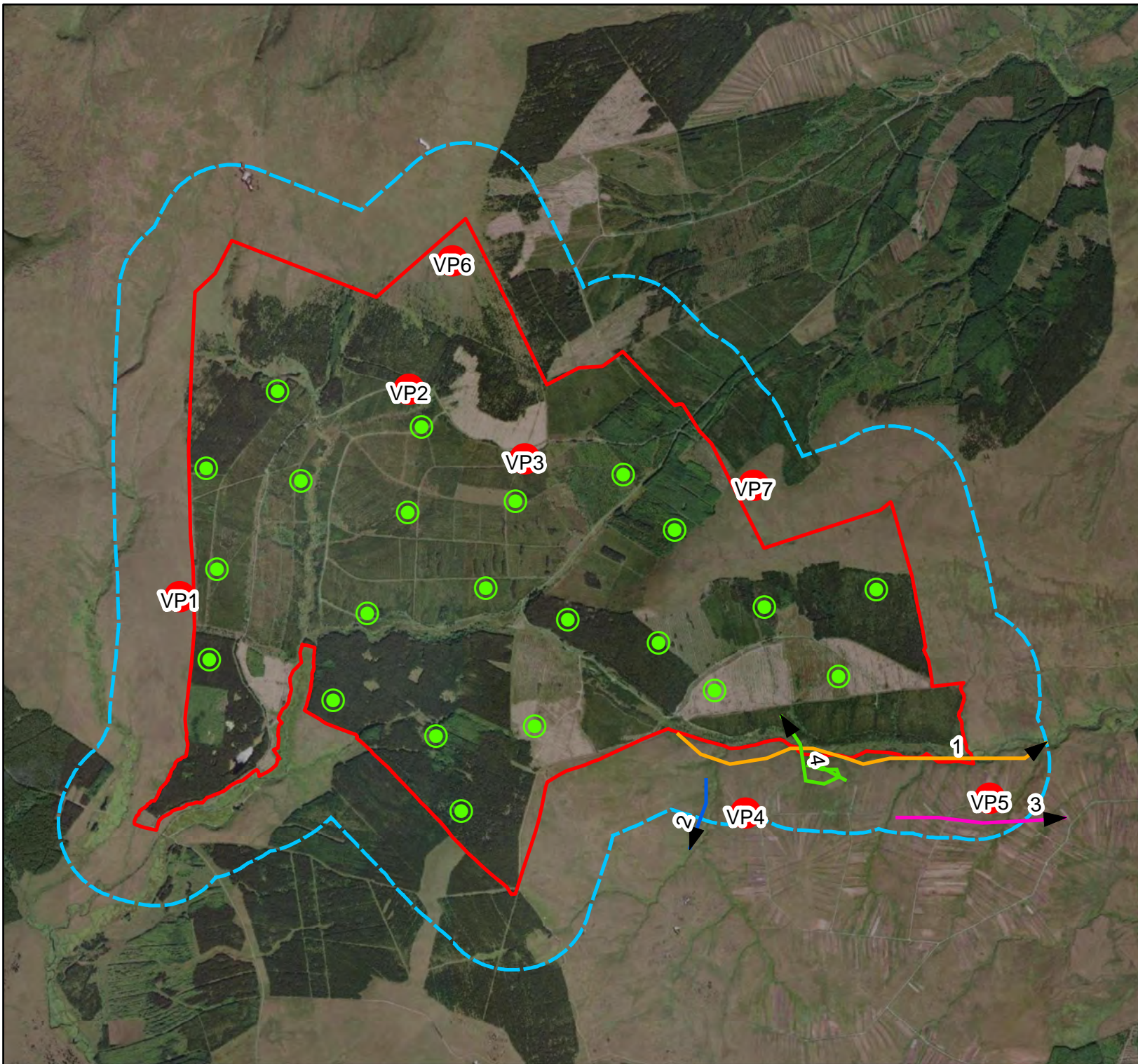
Client: SSE Renewables

Drawing Title:
Map 4-1 Golden Plover

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Grey Heron Flight Path

- ▶ 1, 05/05/2022
- ▶ 2, 01/07/2022
- ▶ 3, 01/07/2022
- ▶ 4, 01/07/2022

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0 0.75 1.5 km

Project Title: 21424 -
Glenora WF - 2022 Breeding bird surveys

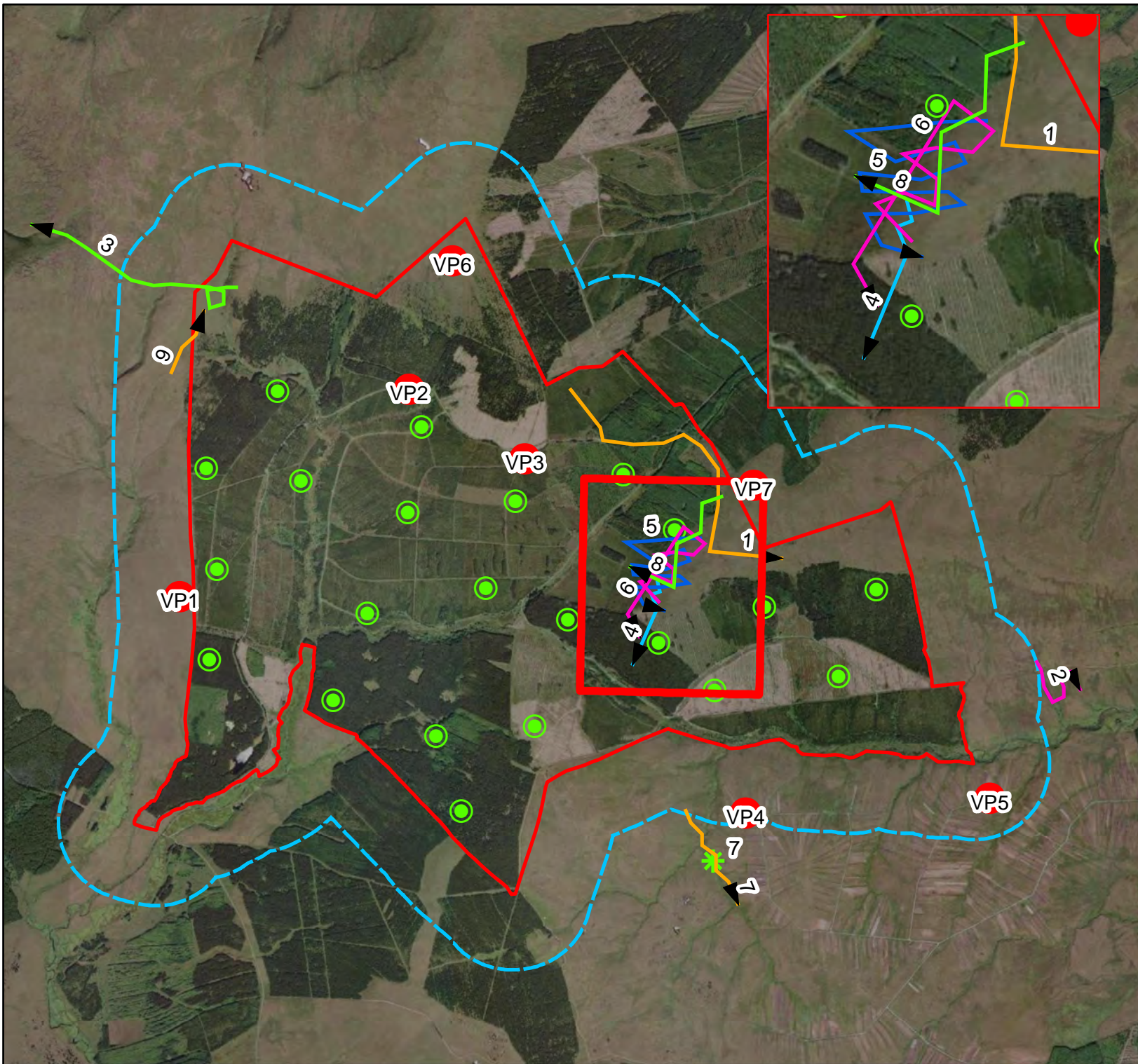
Client: SSE Renewables

Drawing Title:
Map 5-1 Grey Heron

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Kestrel Perched

- ★ 7, 09/08/2022

Kestrel Flight Path

- ▶ 1, 03/05/2022
- ▶ 2, 07/06/2022
- ▶ 3, 15/06/2022
- ▶ 4, 08/07/2022
- ▶ 5, 05/08/2022
- ▶ 6, 05/08/2022
- ▶ 7, 09/08/2022
- ▶ 8, 18/08/2022
- ▶ 9, 06/09/2022

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0 0.75 1.5 km

Project Title: 21424 -
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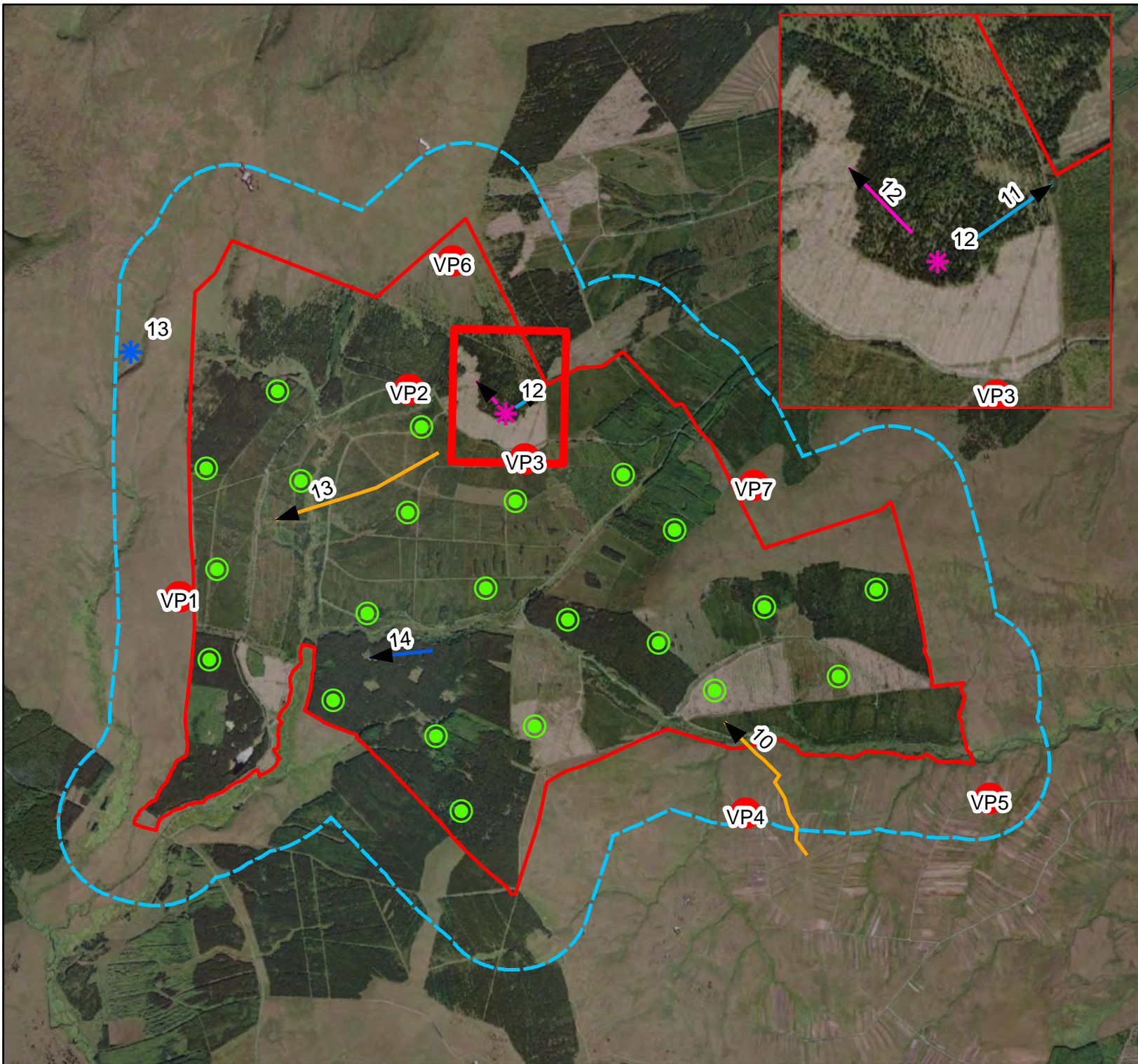
Client: SSE Renewables

Drawing Title:
Map 6-1 Kestrel

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Kestrel Flight Path

- ▶ 10, 12/09/2022
- ▶ 11, 23/09/2022
- ▶ 12, 23/09/2022
- ▶ 13, 23/09/2022
- ▶ 14, 23/09/2022

Kestrel Perched

- ✱ 12, 23/09/2022
- ✱ 13, 23/09/2022

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0 0.75 1.5 km

Project Title: 21424 -
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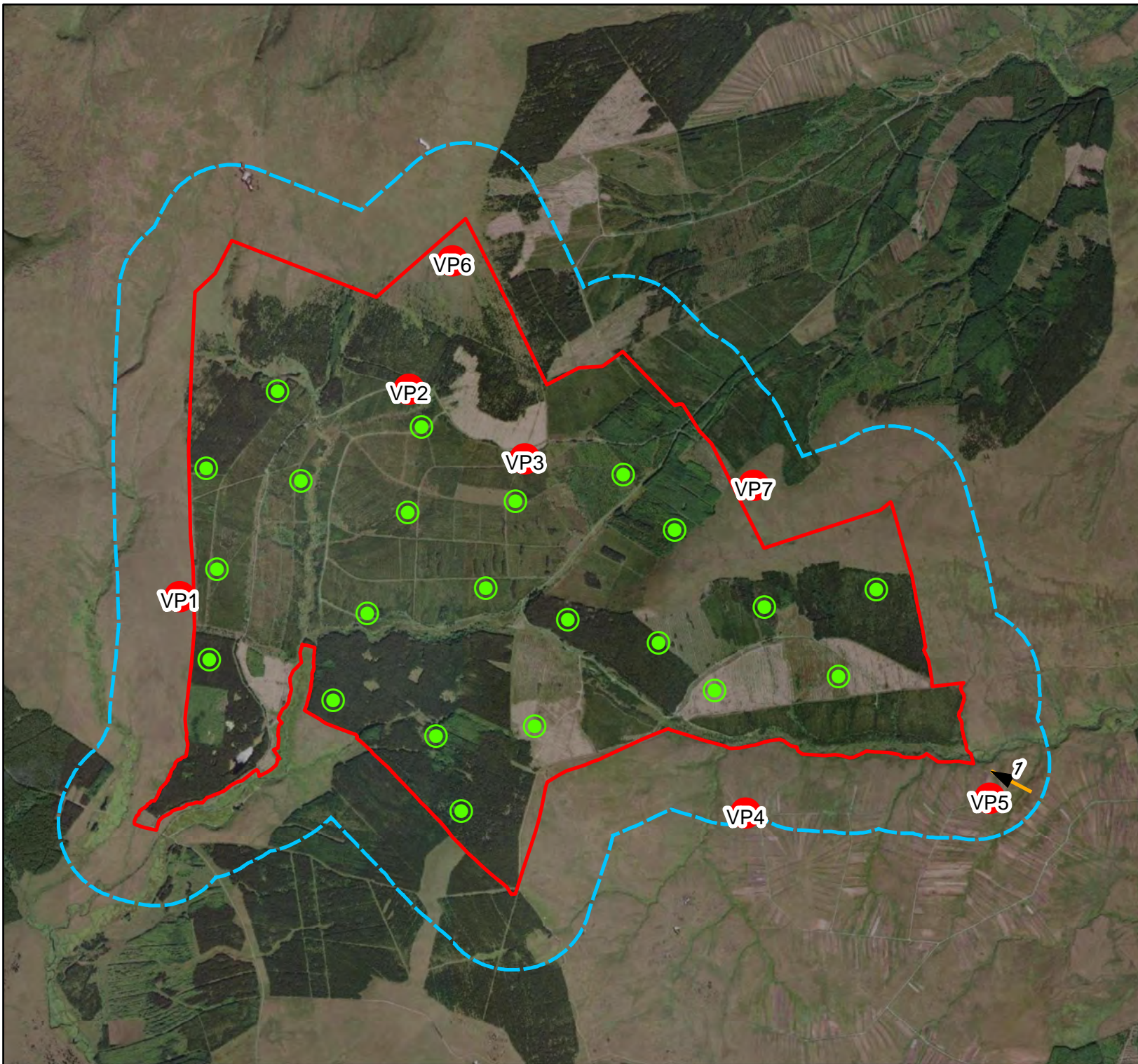
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Drawing Title:
Map 6-2 Kestrel

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Red Grouse Flight Path

- ▶ 1, 05/05/2022

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 CYAL50261645.

0 0.75 1.5 km

Project Title: 21424 -
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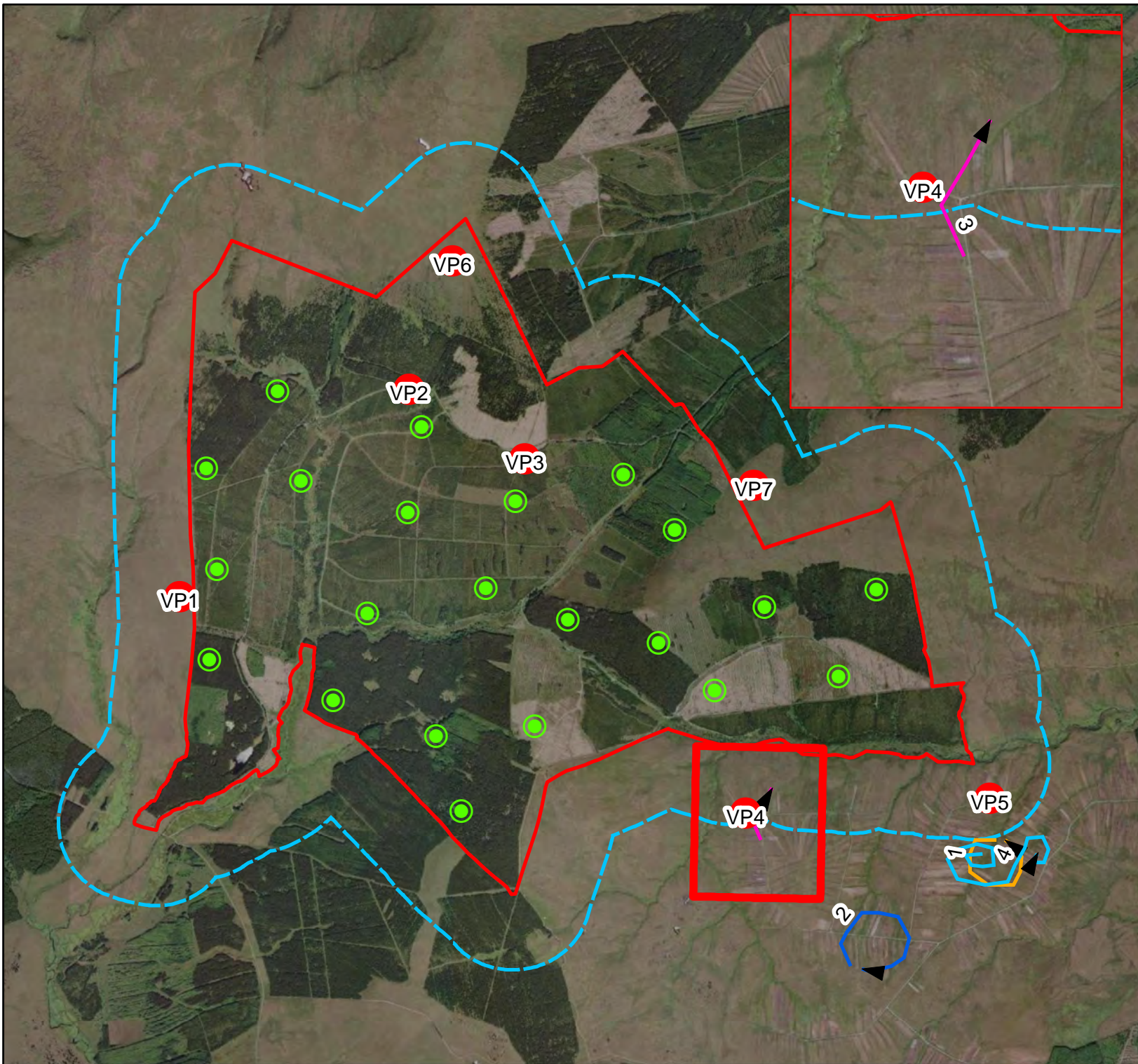
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Drawing Title:
 Map 7-1 Red Grouse

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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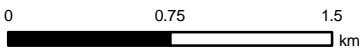
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe Flight Path

- ▶ 1, 05/05/2022
- ▶ 2, 05/05/2022
- ▶ 3, 01/07/2022
- ▶ 4, 02/09/2022

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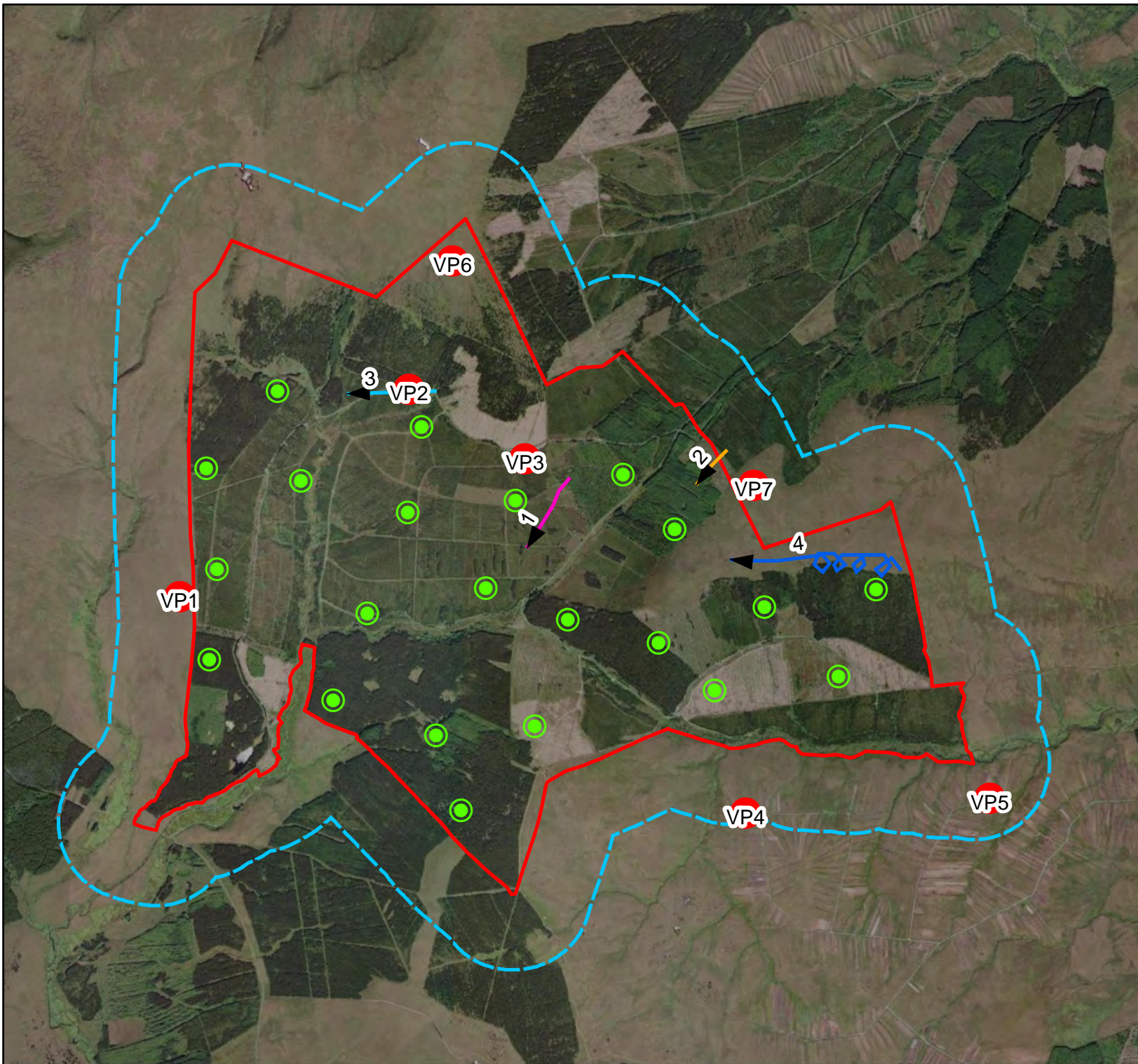
Project Title: 21424 -
Glenora WF - 2022 Breeding bird surveys

Client: SSE Renewables

Drawing Title:
Map 8-1 Snipe

Drawn: VH	Checked: DoB
Date: 24/05/2023	Scale (A4): 1:35,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Sparrowhawk Flight Path

- ▶ 1, 14/04/2022
- ▶ 2, 17/08/2022
- ▶ 3, 22/08/2022
- ▶ 4, 01/09/2022

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0 0.75 1.5 km

Project Title: 21424 -
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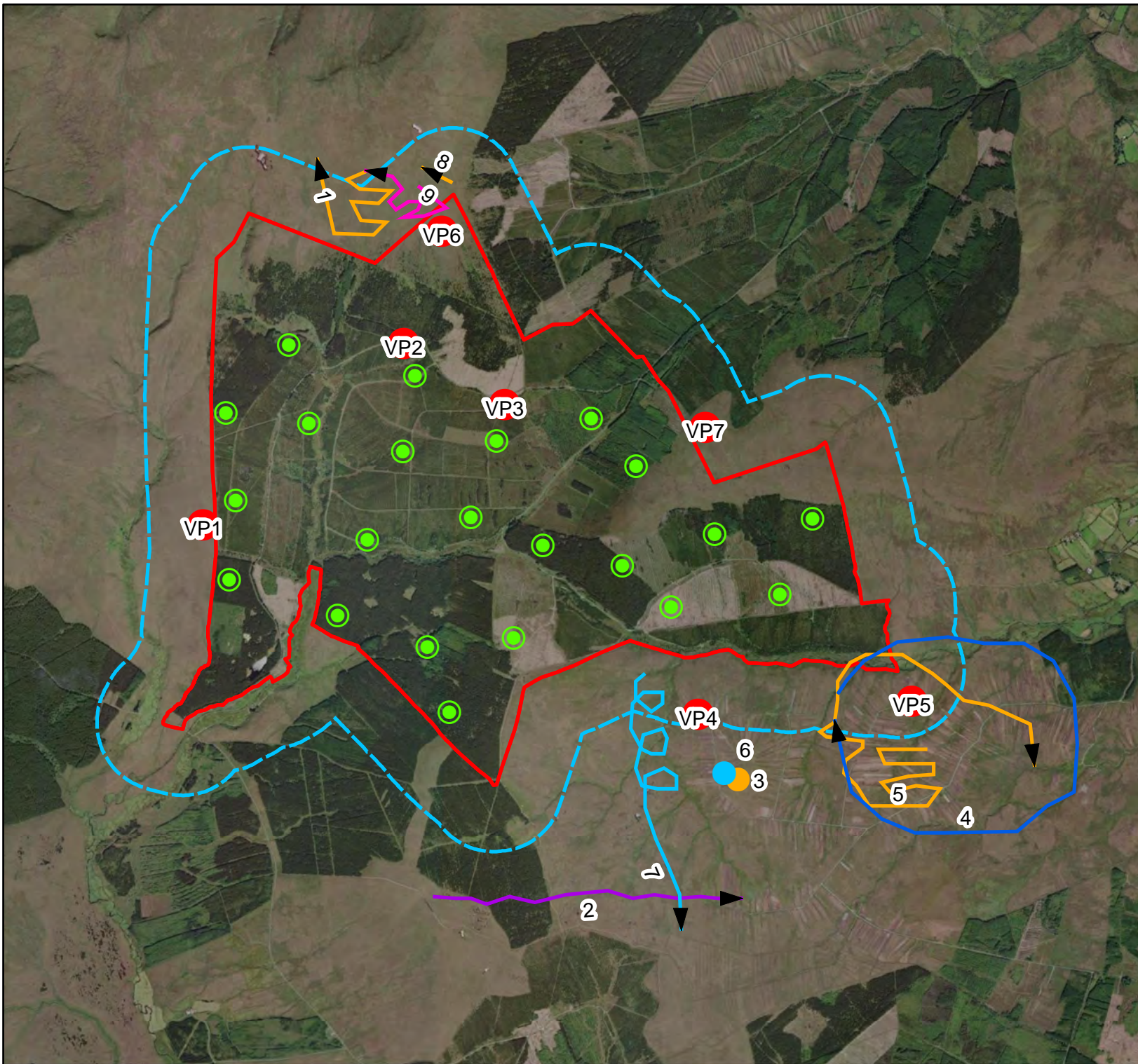
Client: SSE Renewables

Drawing Title:
 Map 9-1 Sparrowhawk

Drawn: VH	Checked: DoB
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Date: 24/05/2023	Scale (A4): 1:35,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Golden Plover Perched

- 3, 01/11/2022 (incidental)
- 6, 03/11/2022

Golden Plover Flight Path

- ▶ 1, 06/10/2022
- ▶ 2, 24/10/2022
- ▶ 4, 03/11/2022
- ▶ 5, 03/11/2022
- ▶ 7, 03/11/2022
- ▶ 8, 10/11/2022
- ▶ 9, 10/11/2022

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0 0.75 1.5 km

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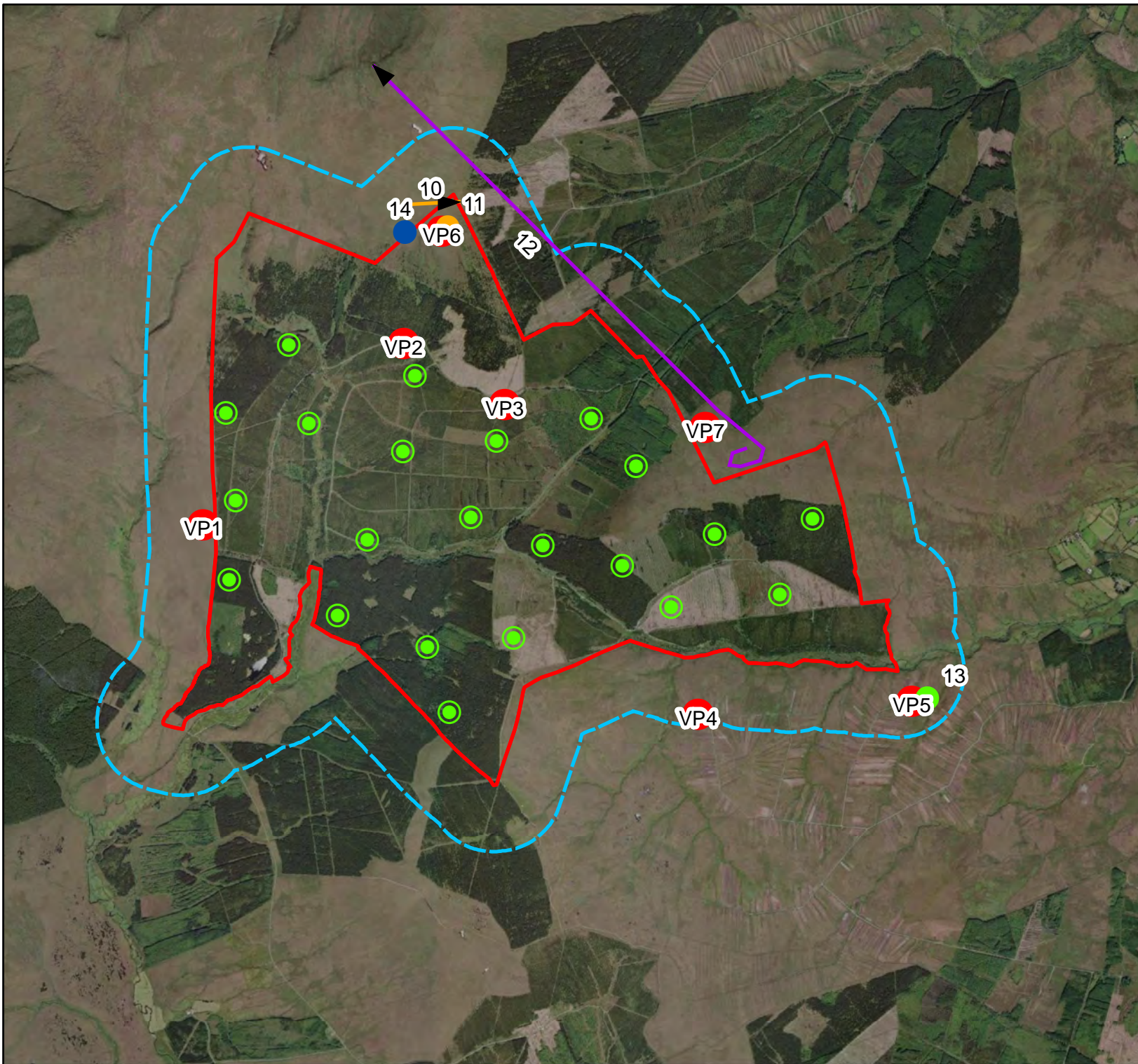
Client: SSE Renewables

Drawing Title:
 Map 1-1 Golden Plover

Drawn: VH	Checked: DoB
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Date: 20/06/2023	Scale (A4): 1:40,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

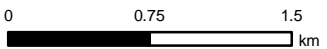
Golden Plover Flight Path

- ▶ 10, 12/12/2022
- ▶ 12, 15/02/2023

Golden Plover Perched

- 11, 14/02/2023 (incidental)
- 13, 17/02/2023 (incidental)
- 14, 17/02/2023 (incidental)

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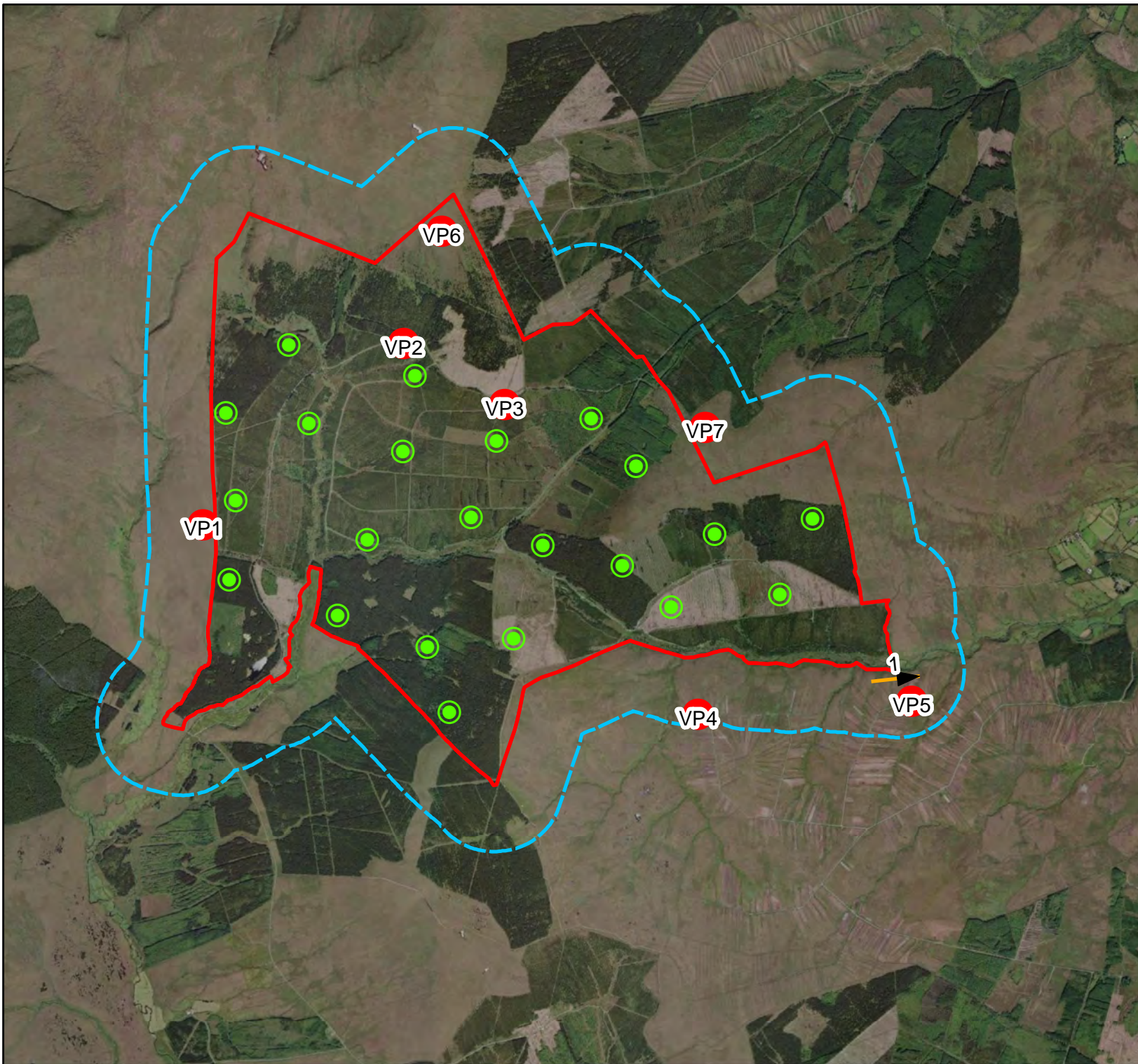
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 1-2 Golden Plover

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Grey Heron Flight Path

- ▶ 1, 17/02/2023

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0 0.75 1.5
km

Project Title: 21424 -
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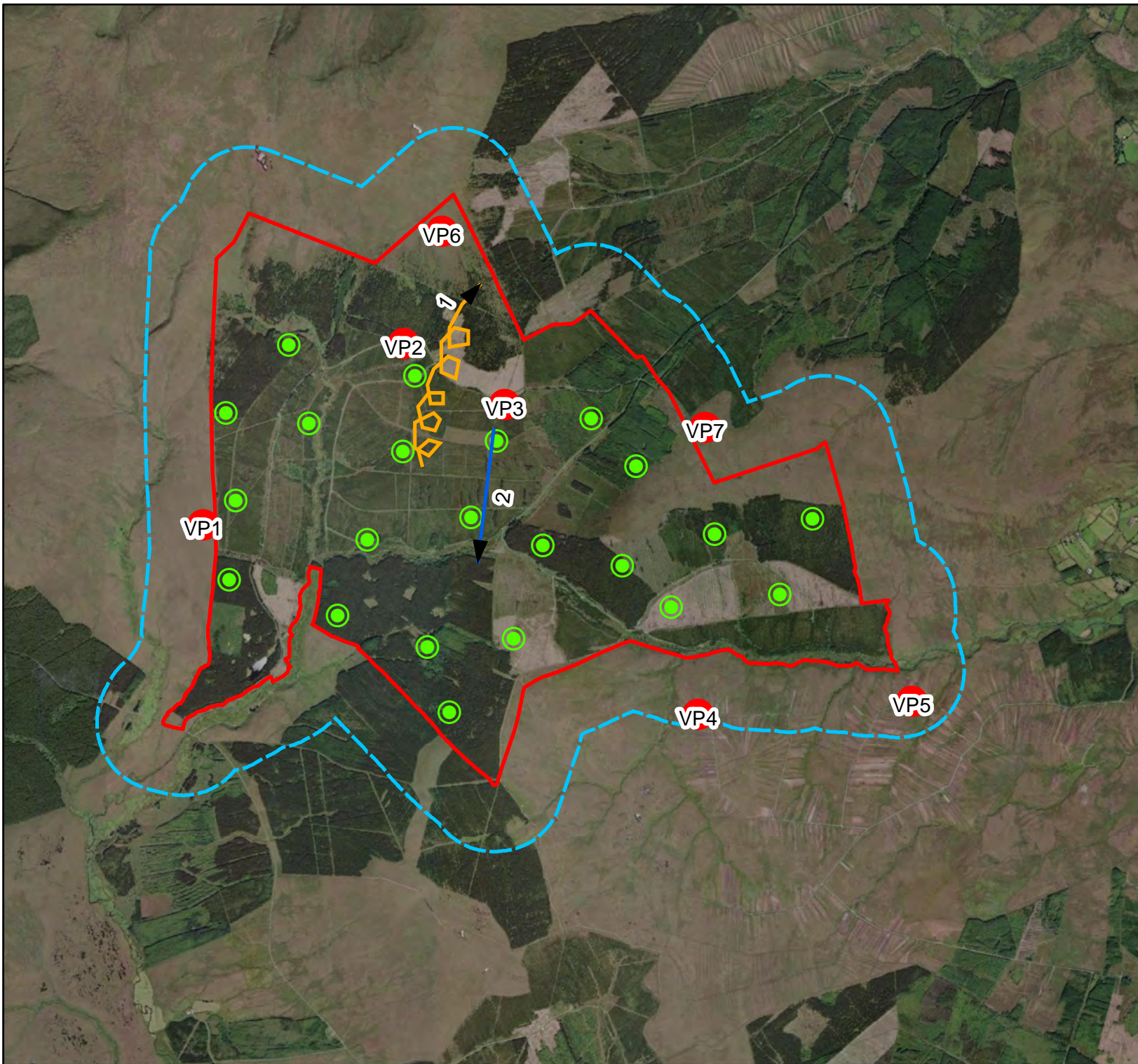
Client: SSE Renewables

Drawing Title:
Map 2-1 Grey Heron

Drawn: VH Checked: DoB

Date: 16/06/2023 Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Hen Harrier Flight Path

- ▶ 1, 24/10/2022
- ▶ 2, 28/02/2023

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 CYAL50261645.

0 0.75 1.5 km

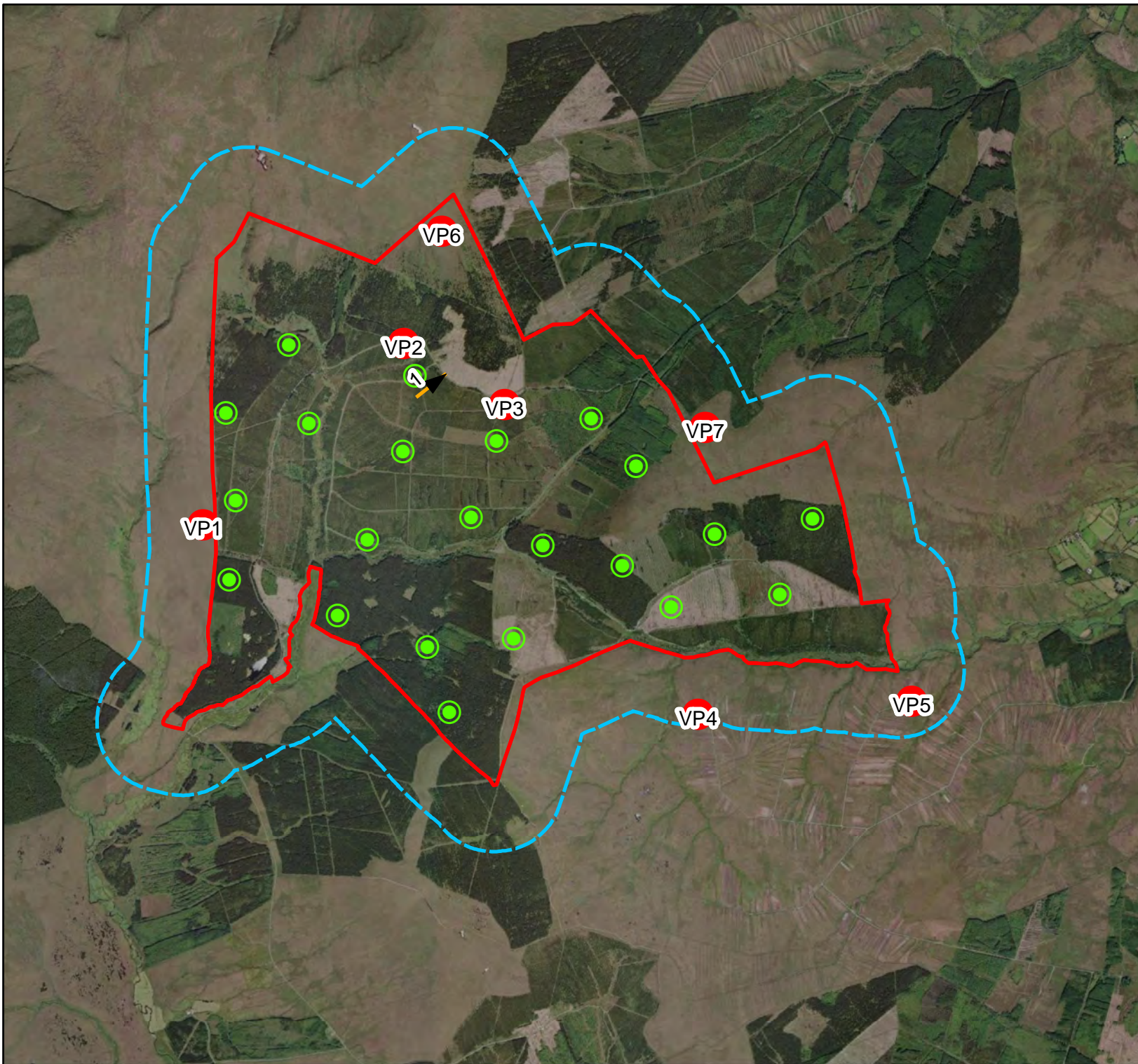
Project Title: 21424 -
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Client: SSE Renewables

Drawing Title:
 Map 3-1 Hen Harrier

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Jack Snipe Flight Path

- ▶ 1, 02/11/2022 *Incidental Observation

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0 0.75 1.5 km

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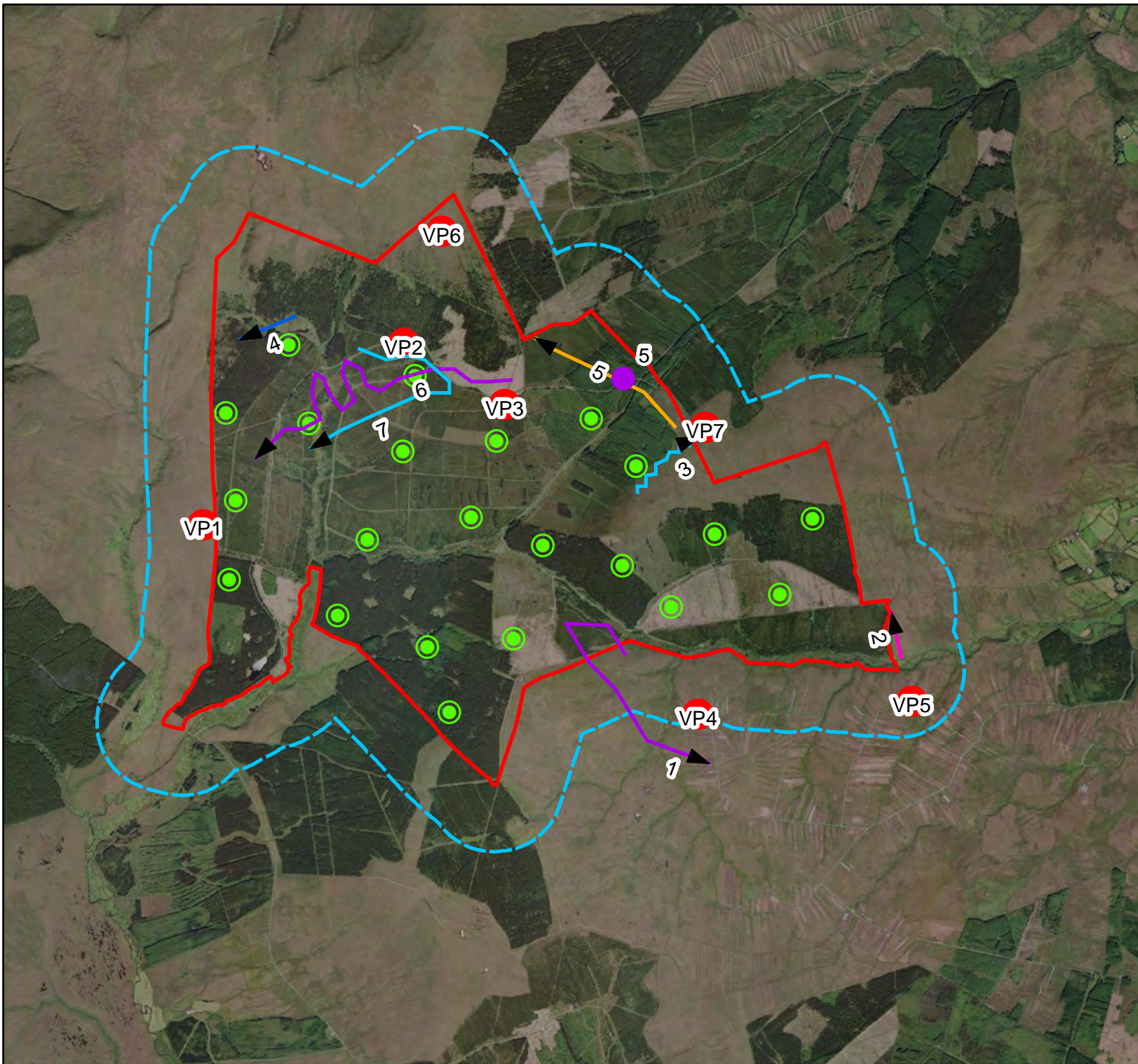
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Drawing Title:
 Map 4-1 Jack Snipe

Drawn: VH	Checked: DoB
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Date: 16/06/2023	Scale (A4): 1:40,000
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Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

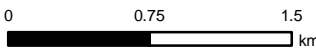
Kestrel Flight Path

- ▶ 1, 05/10/2022
- ▶ 2, 05/10/2022
- ▶ 3, 17/10/2022
- ▶ 4, 18/10/2022
- ▶ 5, 24/10/2022
- ▶ 6, 02/11/2022
- ▶ 7, 02/11/2022

Kestrel Perched

- 5, 24/10/2022

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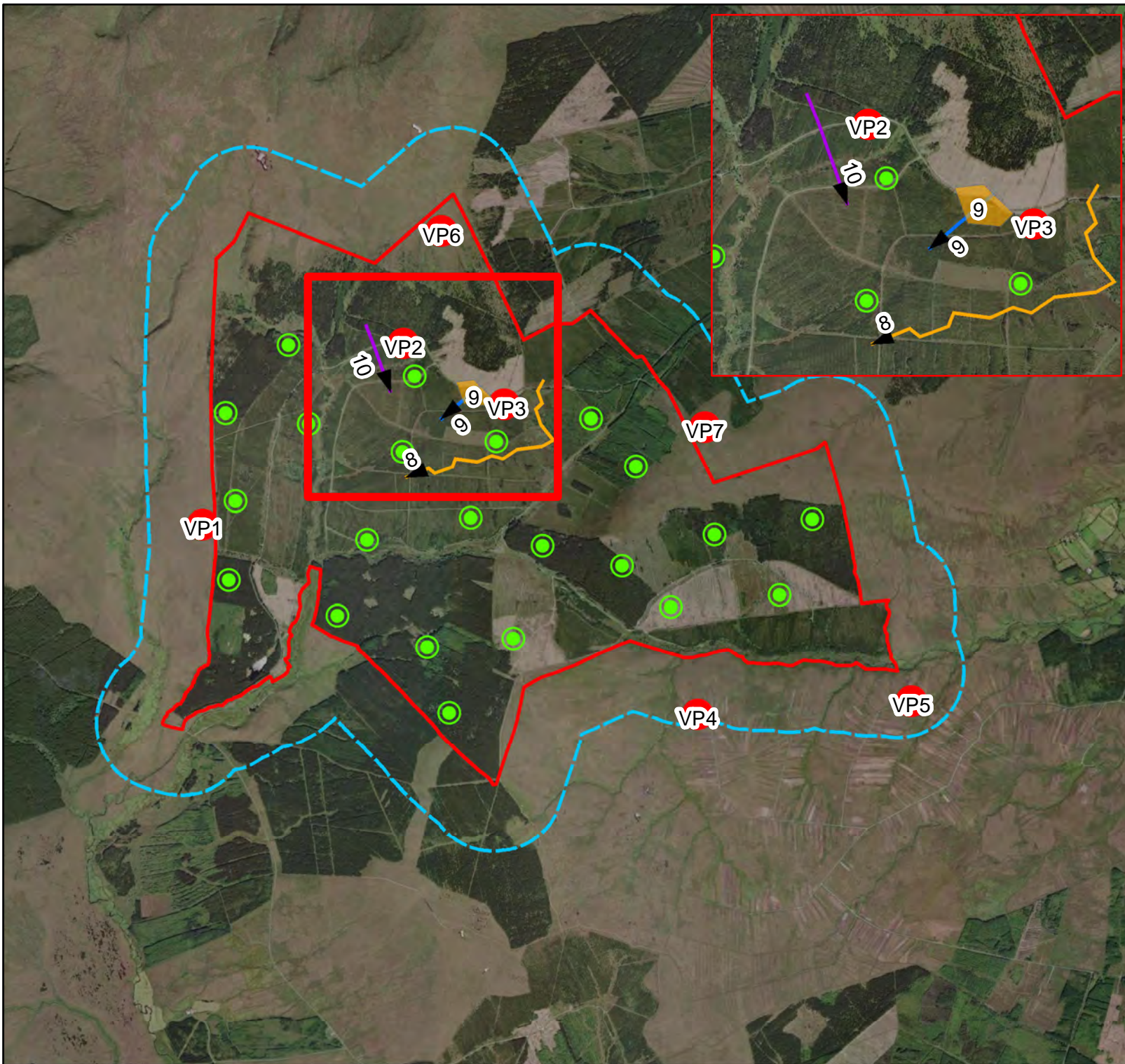
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 5-1 Kestrel

Drawn: VH	Checked: DoB
Date: 19/06/2023	Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

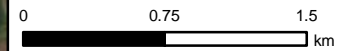
Kestrel Flight Path

- ▶ 8, 09/11/2022
- ▶ 9, 15/11/2022
- ▶ 10, 18/11/2022

Kestrel Activity

- 9, 15/11/2022

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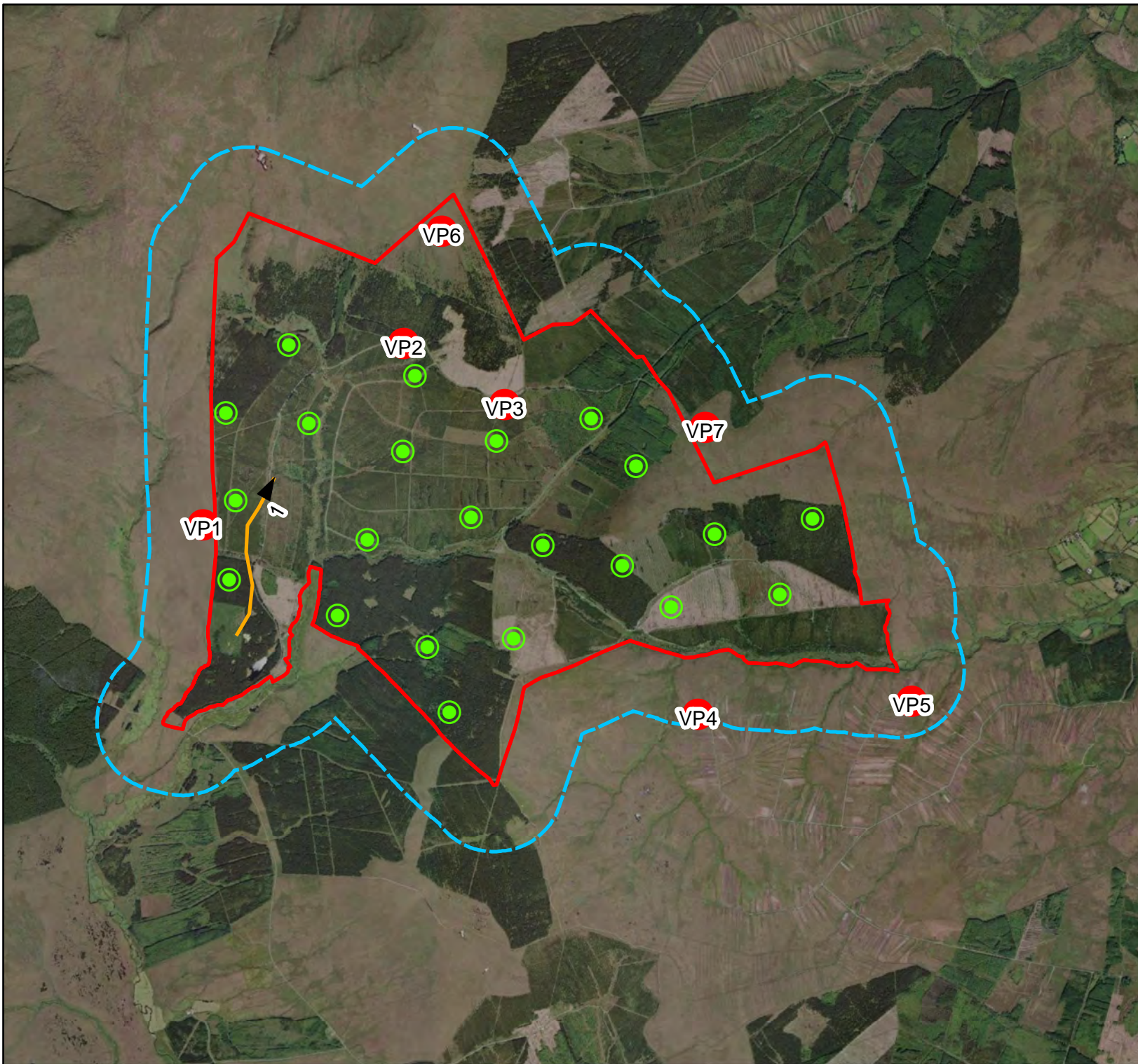
Client: SSE Renewables

Drawing Title:
Map 5-2 Kestrel

Drawn: VH Checked: DoB

Date: 19/06/2023 Scale (A4): 1:40,000





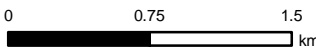
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Mallard Flight Path

➤ 1, 26/03/2023

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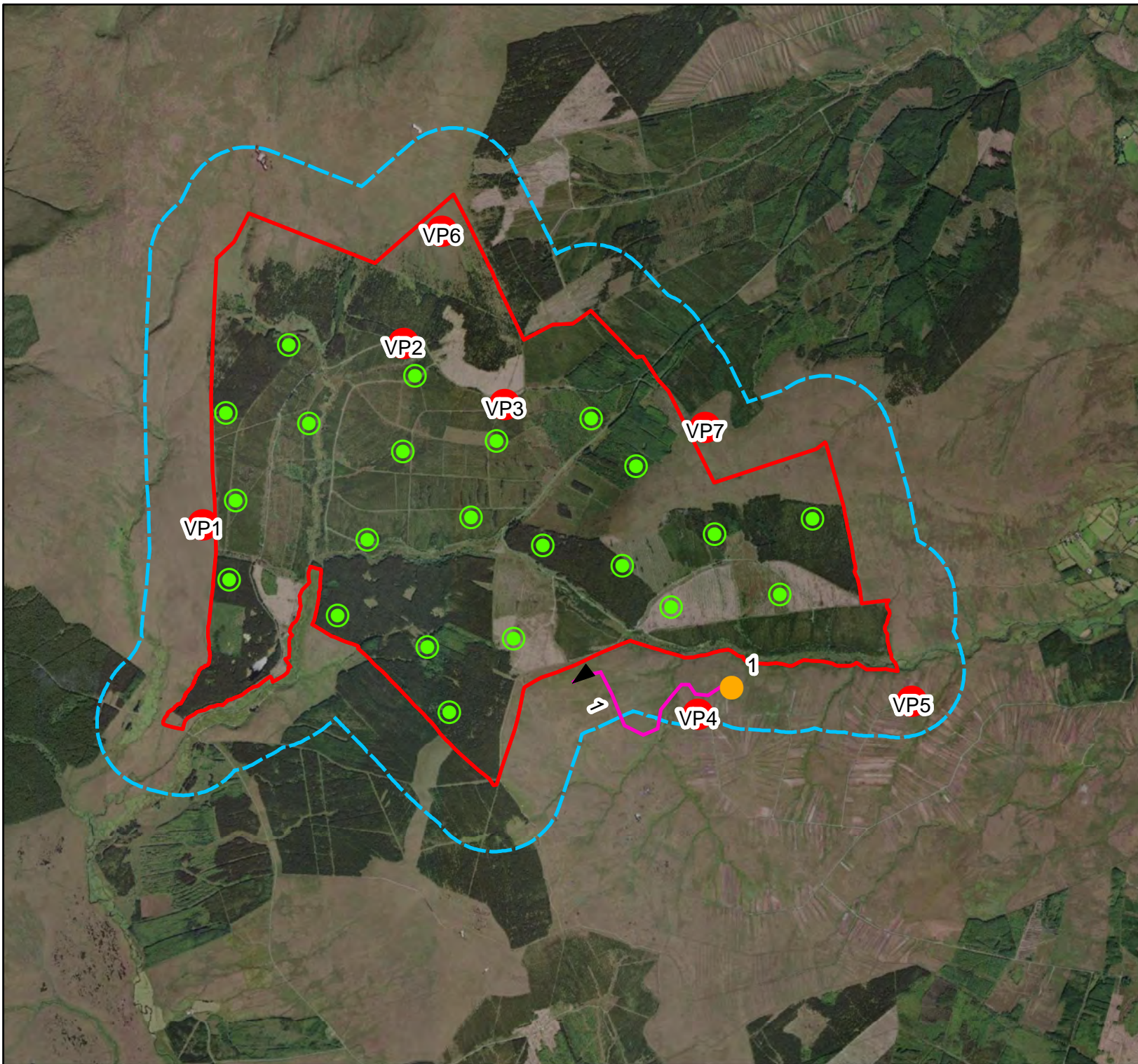
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 6-1 Mallard

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

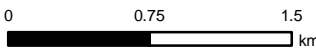
Merlin Flight Path

▶ 1, 29/03/2023

Merlin Perched

● 1, 29/03/2023

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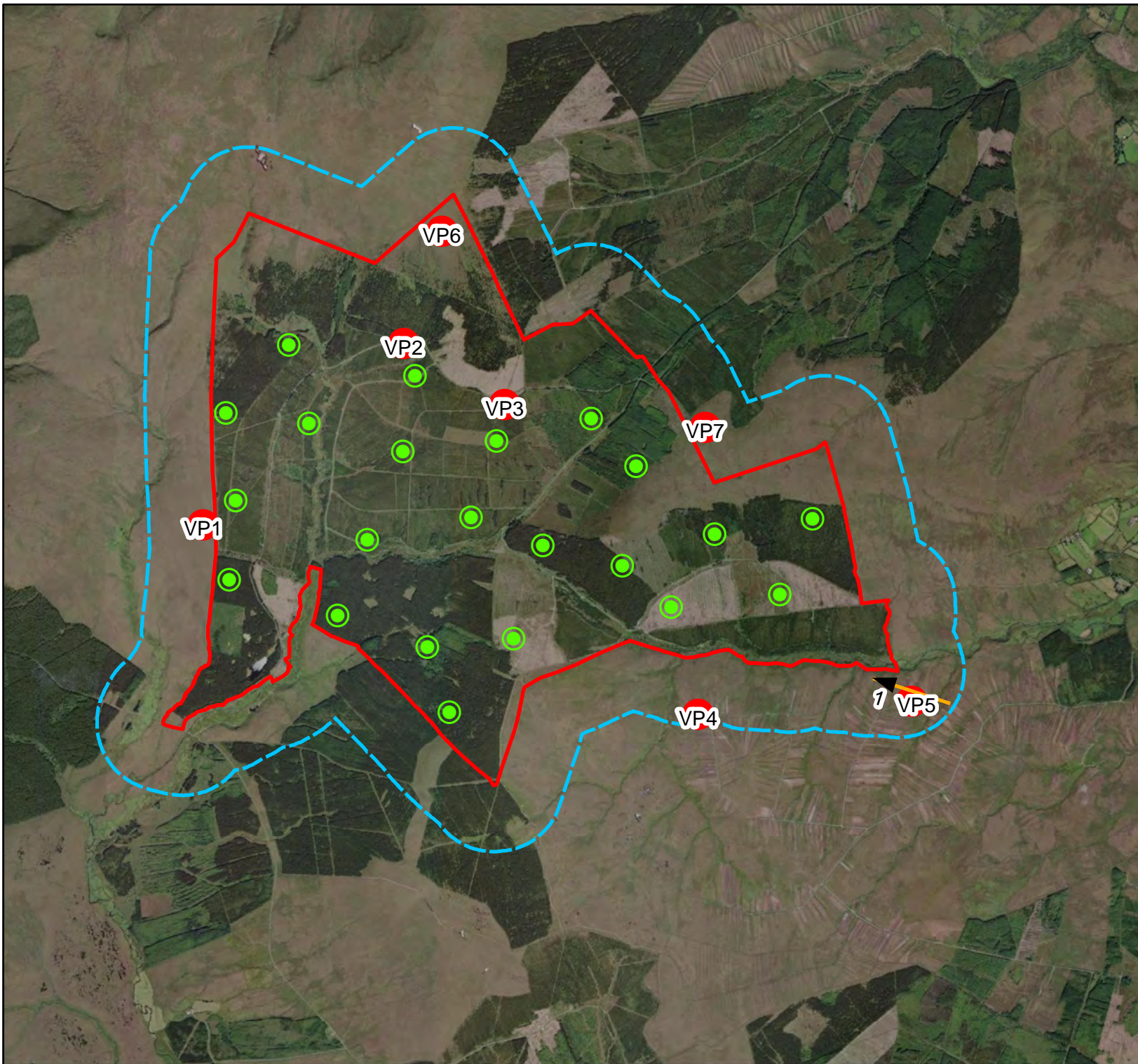
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 7-1 Merlin

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





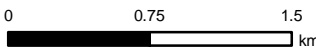
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Northern Diver Flight Path

▶ 1, 03/11/2022

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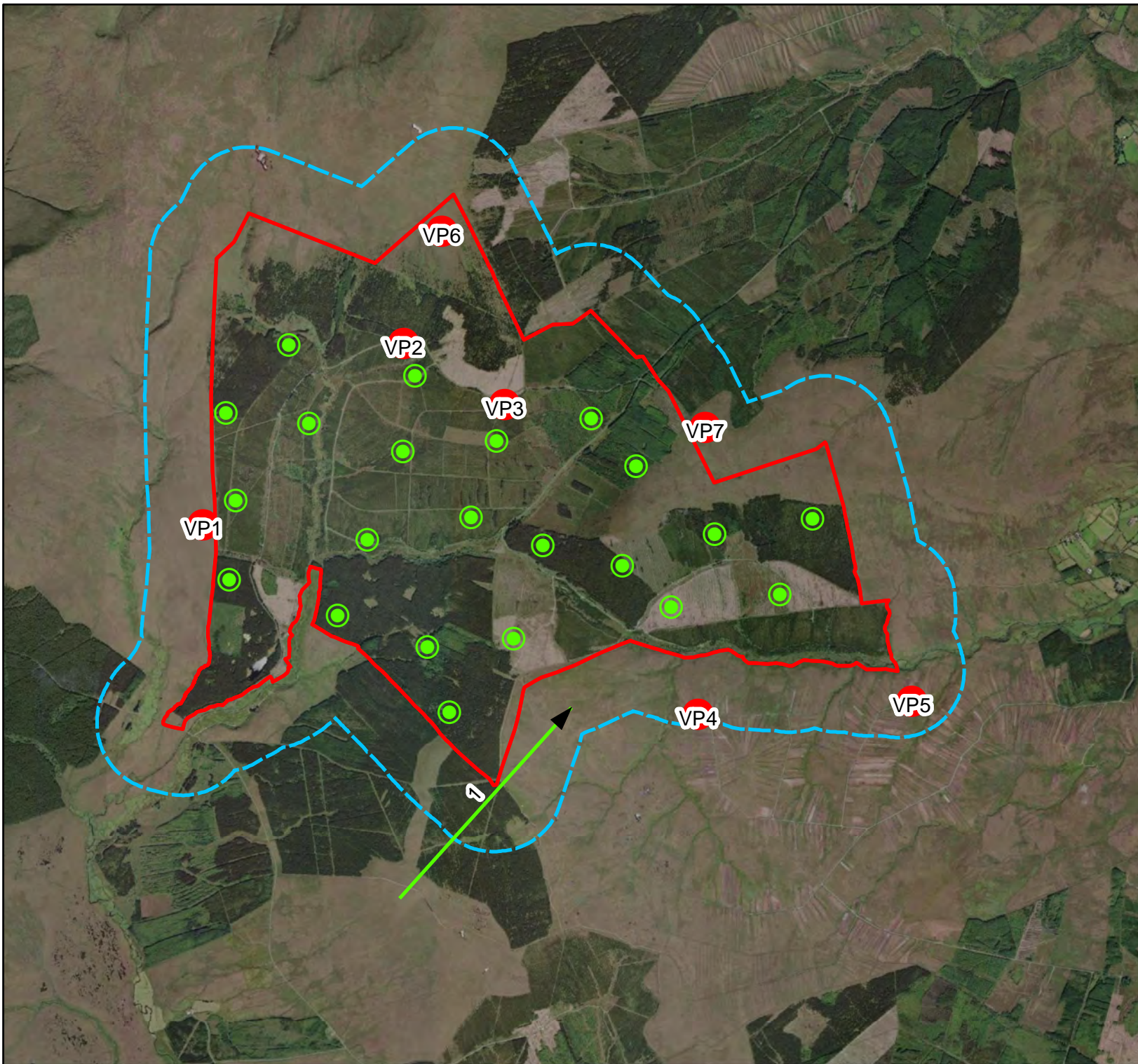
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 8-1 Northern Diver

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





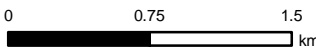
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Peregrine Flight Path

▶ 1, 24/10/2022

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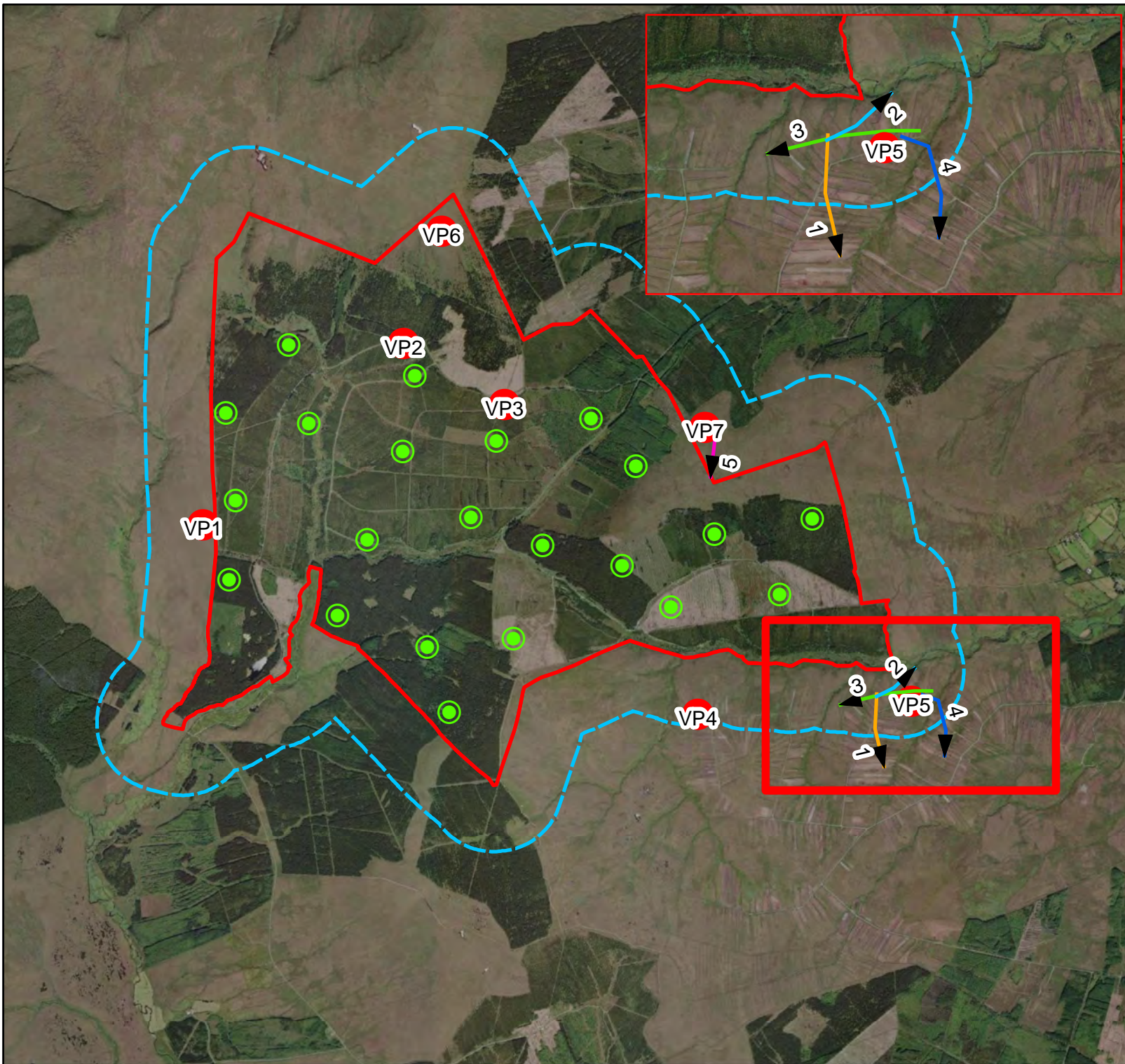
Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
Map 9-1 Peregrine

Drawn: VH	Checked: DoB
Date: 13/06/2023	Scale (A4): 1:40,000





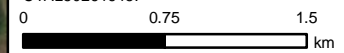
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Red Grouse Flight Path

- ▶ 1, 04/10/2022
- ▶ 2, 04/10/2022
- ▶ 3, 05/10/2022
- ▶ 4, 05/10/2022
- ▶ 5, 15/02/2023

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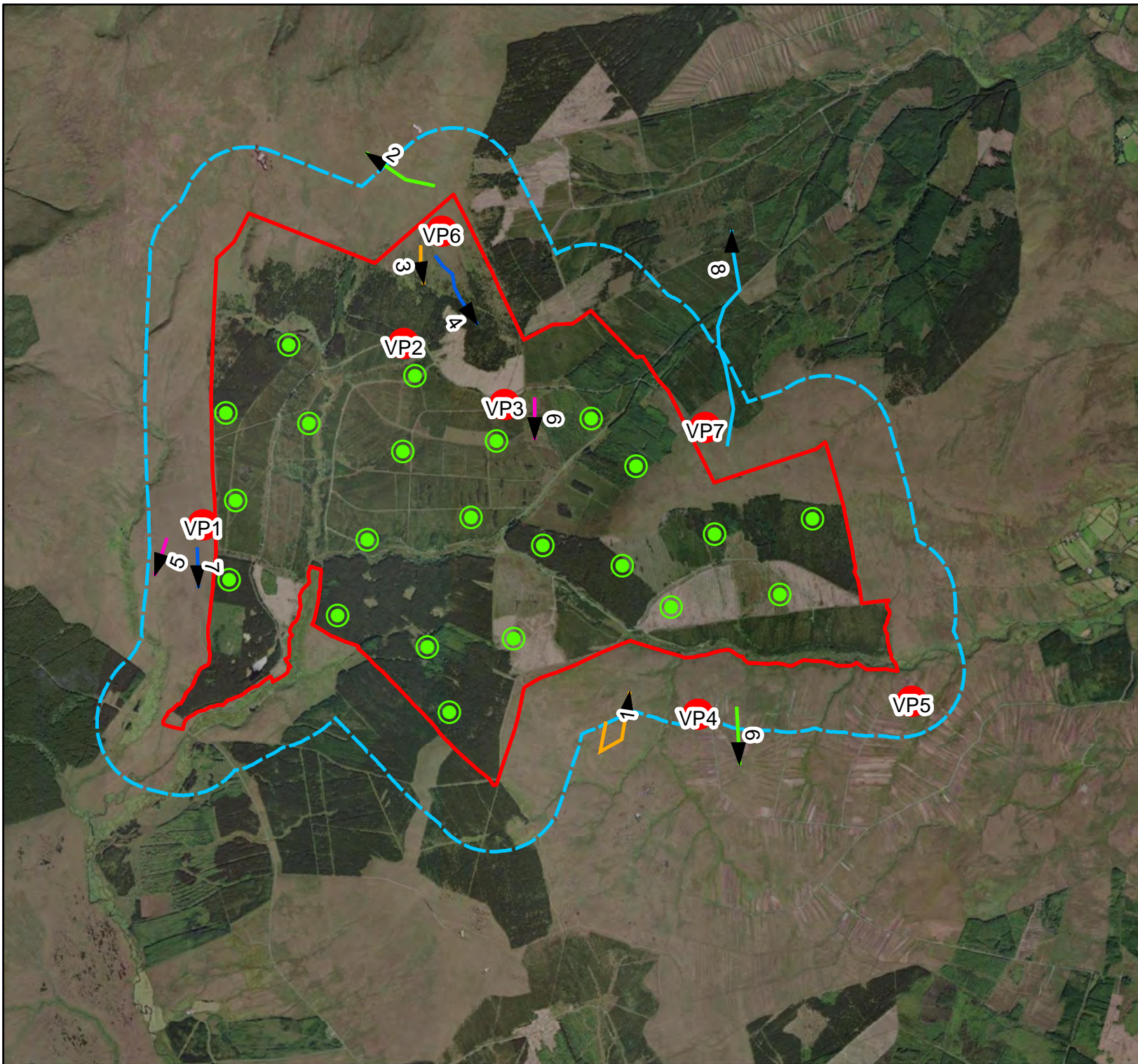
Client: SSE Renewables

Drawing Title:
Map 10-1 Red Grouse

Drawn: VH Checked: DoB

Date: 16/06/2023 Scale (A4): 1:40,000





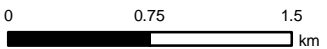
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe Flight Path

- ▶ 1, 04/10/2022
- ▶ 2, 06/10/2022
- ▶ 3, 24/10/2022
- ▶ 4, 09/11/2022
- ▶ 5, 16/11/2022
- ▶ 6, 01/12/2022
- ▶ 7, 06/12/2022
- ▶ 8, 08/12/2022
- ▶ 9, 13/12/2022

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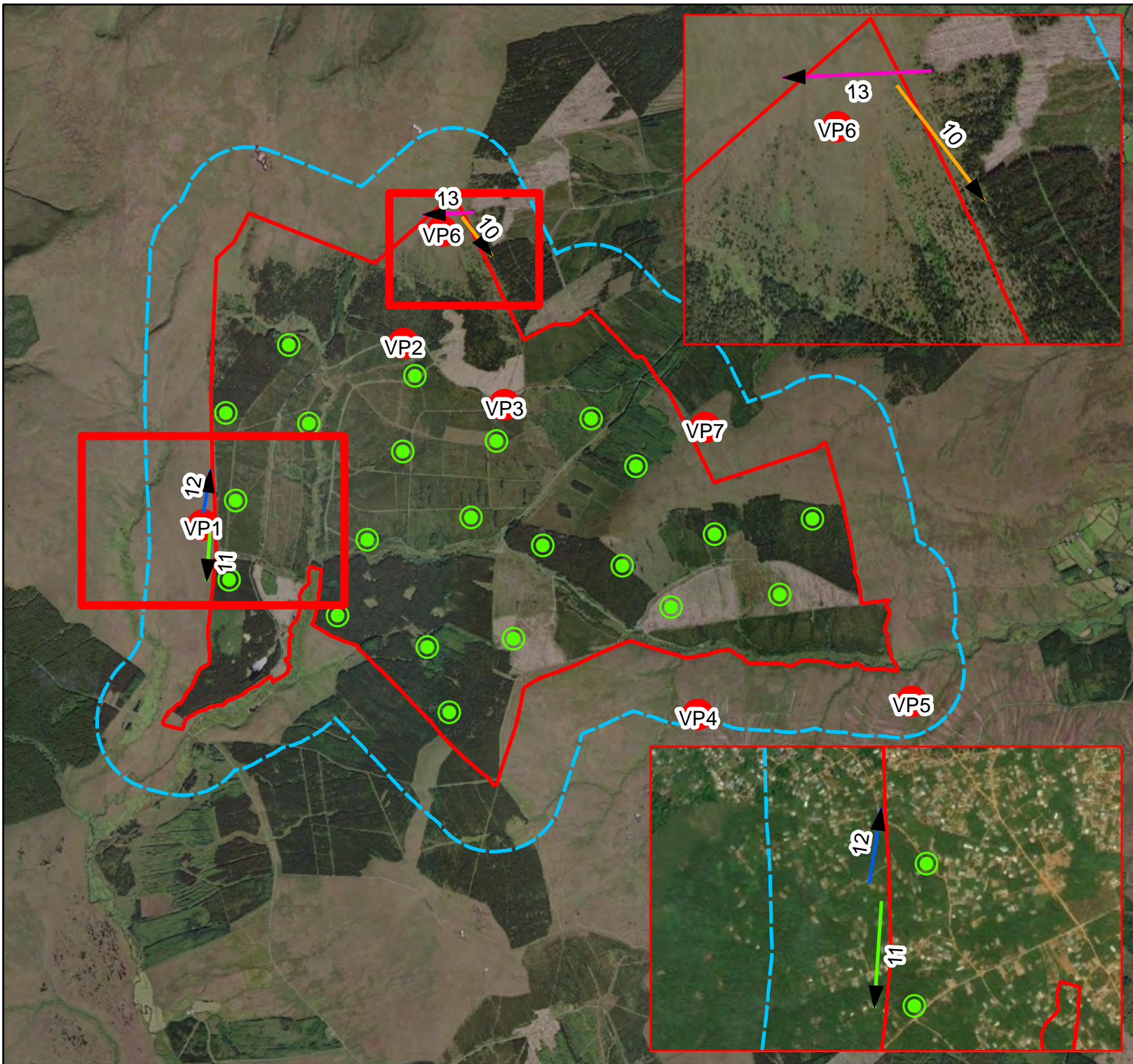
Client: SSE Renewables

Drawing Title:
Map 11-1 Snipe

Drawn: VH Checked: DoB

Date: 19/06/2023 Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Snipe Flight Path

- 10, 13/12/2022
- 11, 10/01/2023 (incidental)
- 12, 10/01/2023 (incidental)
- 13, 10/01/2023 (incidental)

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0 0.75 1.5 km

Project Title: 21424 -
Glenora WF - 2022/23 Winter bird surveys

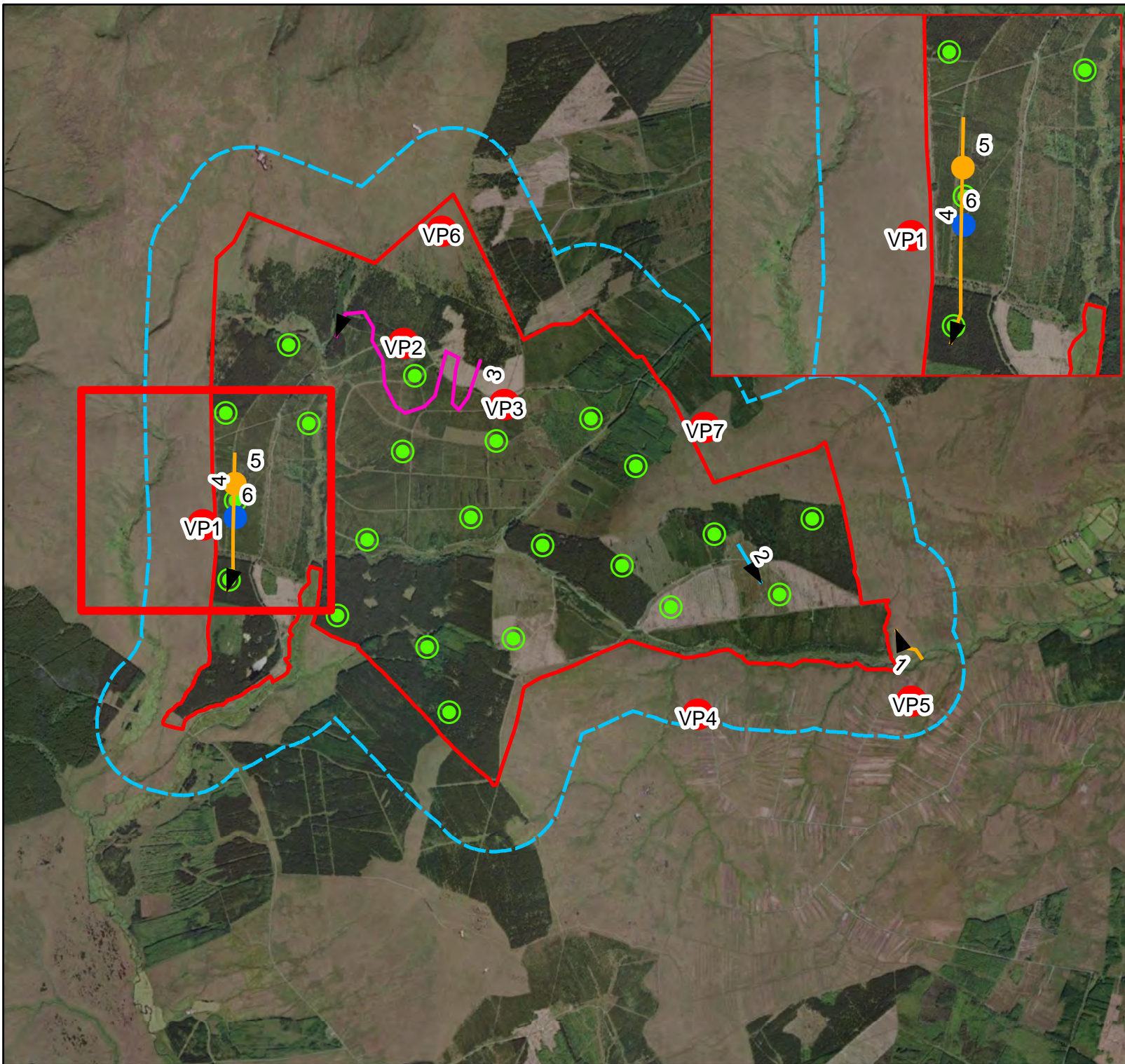
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Drawing Title:
Map 11-2 Snipe

Drawn: VH Checked: DoB

Date: 13/06/2023 Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

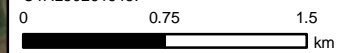
Sparrowhawk Perched

- 5, 07/12/2022
- 6, 07/12/2022

Map 12-1 Sparrowhawk

- ▶ 1, 03/11/2022
- ▶ 2, 02/12/2022
- ▶ 3, 07/12/2022
- ▶ 4, 07/12/2022

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Glenora WF - 2022/23 Winter bird surveys

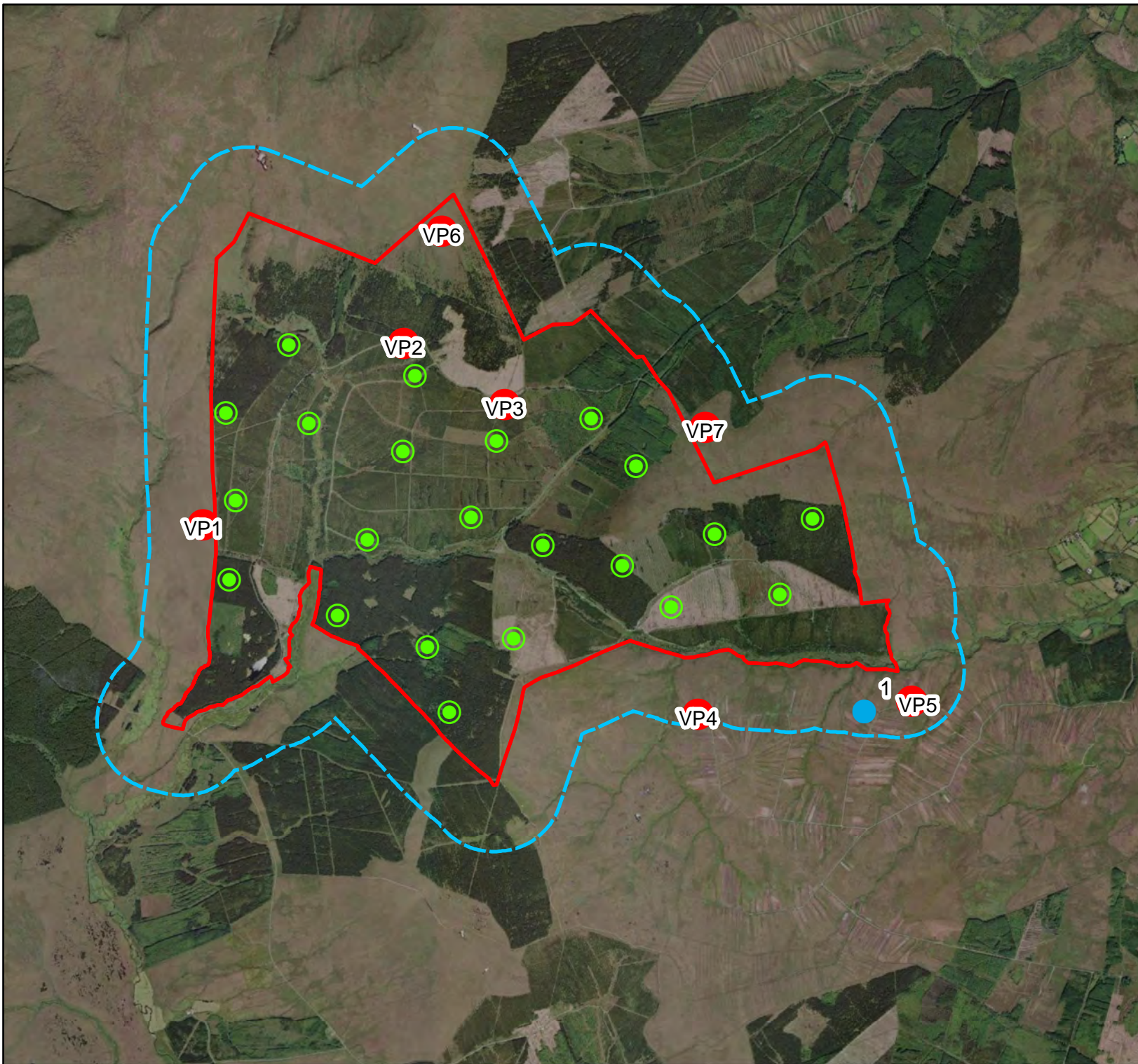
Client: SSE Renewables

Drawing Title:
Map 12-1 Sparrowhawk

Drawn: VH Checked: DoB

Date: 19/06/2023 Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Teal Perched

- 1, 03/11/2022

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2022/23 Winter bird surveys

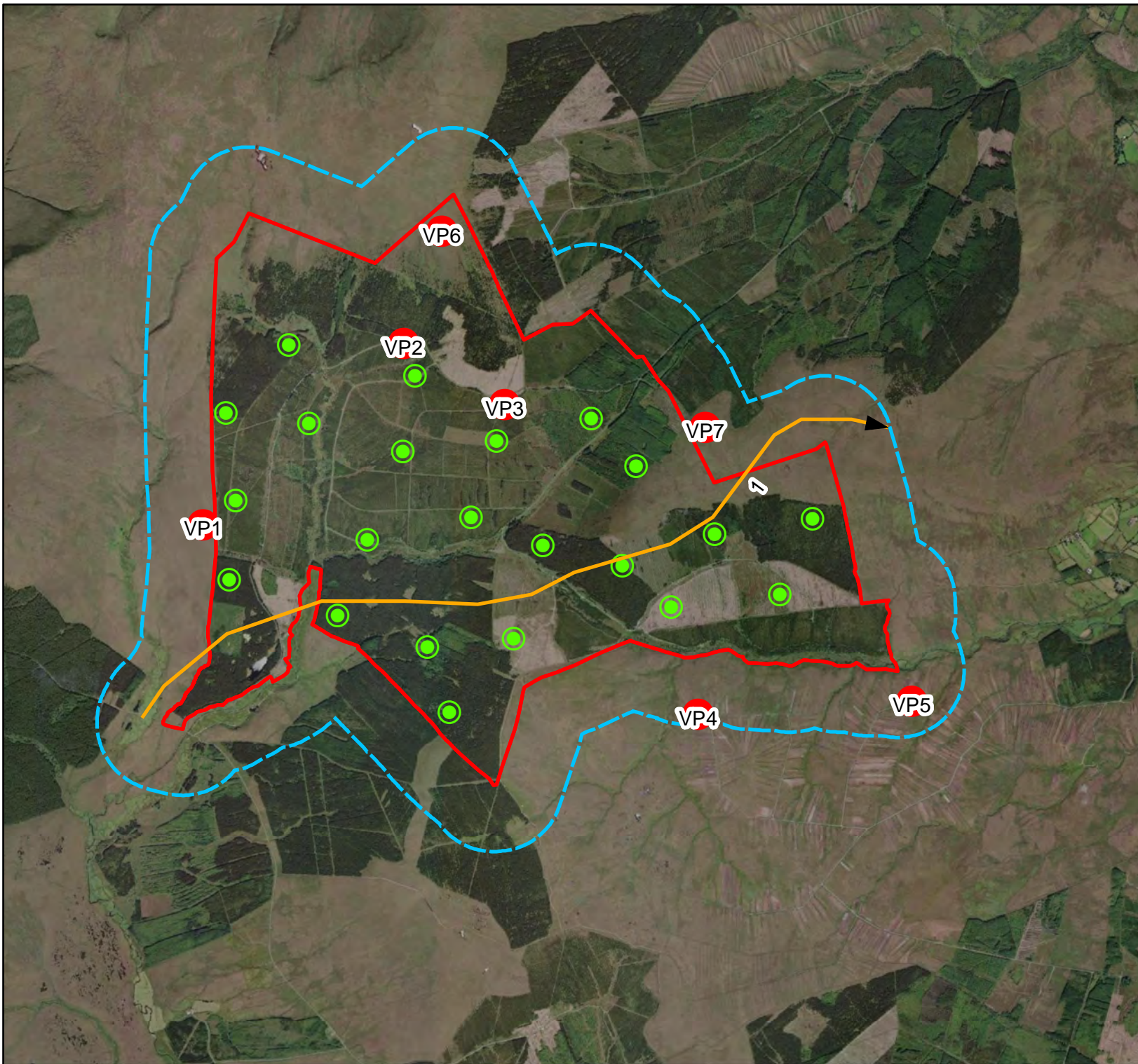
Client: SSE Renewables

Drawing Title:
 Map 13-1 Teal

Drawn: VH Checked: DoB

Date: 13/06/2023 Scale (A4): 1:40,000





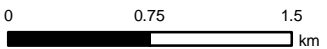
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Whooper Swan Flight Path

▶ 1, 06/12/2023

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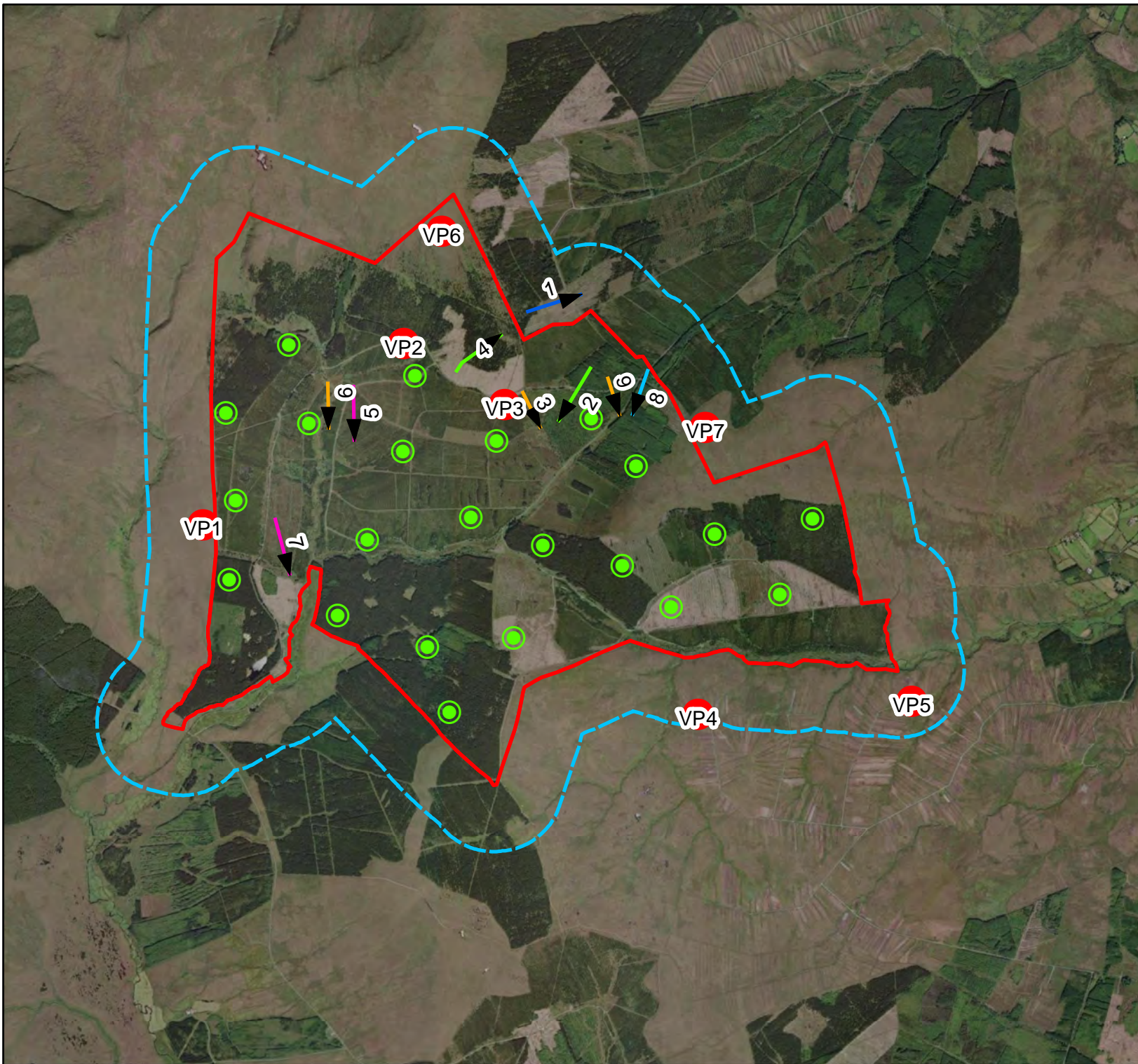
Client: SSE Renewables

Drawing Title:
Map 14-1 Whooper Swan

Drawn: VH Checked: DoB

Date: 13/06/2023 Scale (A4): 1:40,000





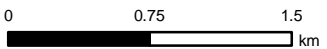
Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Woodcock Flight Path

- ▶ 1, 24/10/2022 (incidental)
- ▶ 2, 06/12/2022 (incidental)
- ▶ 3, 06/12/2022 (incidental)
- ▶ 4, 06/12/2022 (incidental)
- ▶ 5, 06/12/2022 (incidental)
- ▶ 6, 06/12/2022 (incidental)
- ▶ 7, 06/12/2022 (incidental)
- ▶ 8, 08/12/2022 (incidental)
- ▶ 9, 08/12/2022 (incidental)

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Glenora WF - 2022/23 Winter bird surveys

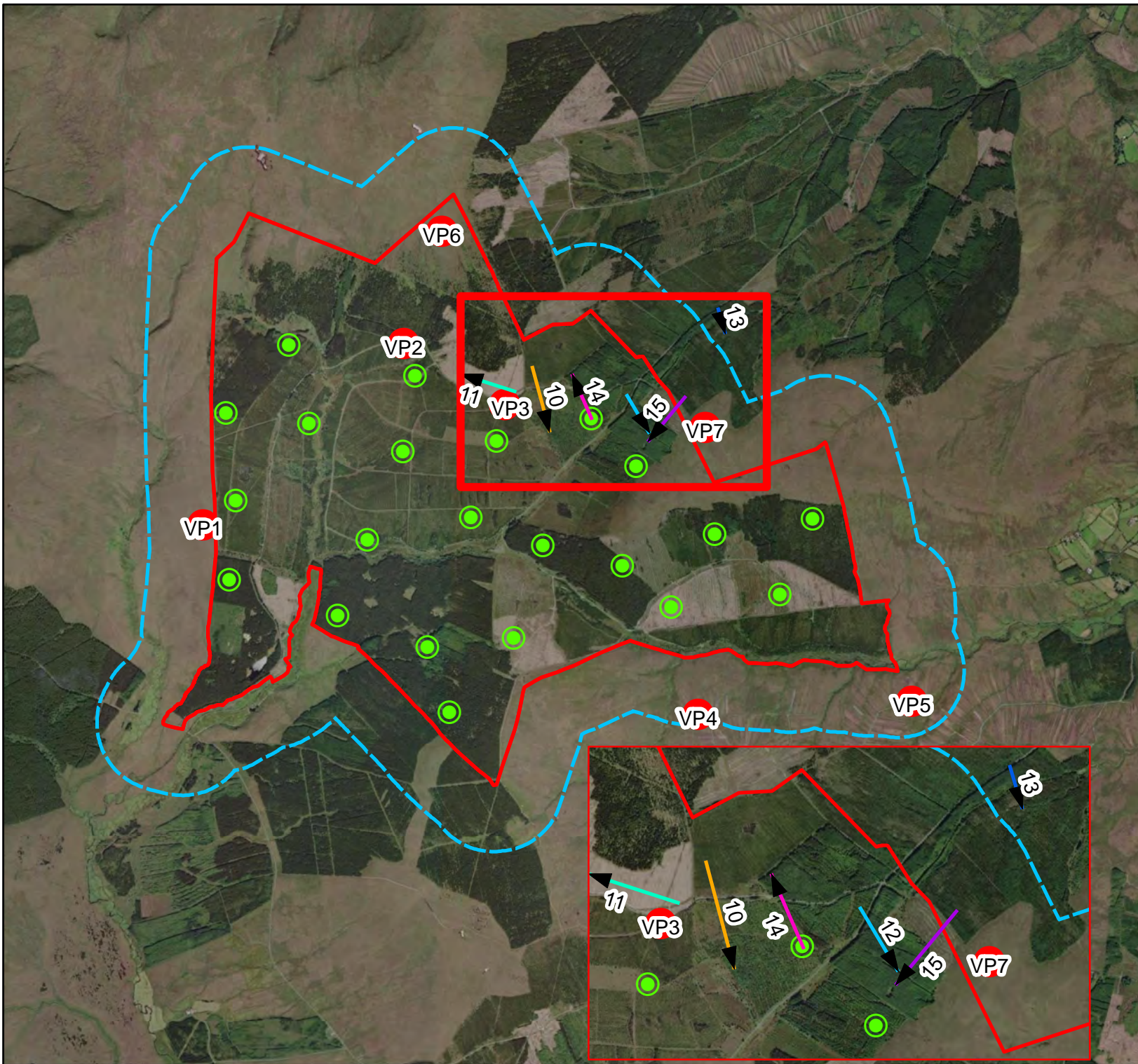
Client: SSE Renewables

Drawing Title:
Map 15-1 Woodcock

Drawn: VH Checked: DoB

Date: 20/06/2023 Scale (A4): 1:40,000





Legend

- Site Boundary
- Vantage Point Locations
- Flight Activity Survey Area 500m
- Turbine Locations

Woodcock Flight Path

- ▶ 10, 08/12/2022 (incidental)
- ▶ 11, 08/12/2022 (incidental)
- ▶ 12, 12/12/2022 (incidental)
- ▶ 13, 13/12/2022 (incidental)
- ▶ 14, 13/12/2022 (incidental)
- ▶ 15, 15/02/2023

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0 0.75 1.5 km

Project Title: 21424 -
 Glenora WF - 2022/23 Winter bird surveys

Client: SSE Renewables

Drawing Title:
 Map 15-2 Woodcock

Drawn: VH	Checked: DoB
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Date: 20/06/2023	Scale (A4): 1:40,000
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Appendix 6

**Non-Target/Secondary Species of Conservation Concern
recorded during VP Surveys**

Breeding 2019

The following summary outlines all non-target species of conservation concern recorded during the breeding 2019 VP surveys.

Meadow pipit (*Anthus pratensis*), grey wagtail (*Motacilla cinerea*) and swift (*Apus apus*) were the only non-target red-listed species which were recorded. Meadow pipit was recorded in every month throughout the site with numbers peaking in April. One grey wagtail was recorded in September only. Swift was recorded in July only. Amber-listed non-target species which were frequently recorded included goldcrest (*Regulus regulus*) and skylark (*Alauda arvensis*), while other less frequently recorded species comprised swallow (*Hirundo rustica*), starling (*Sturnus vulgaris*), linnet (*Carduelis cannabina*), sand martin (*Riparia riparia*), spotted flycatcher (*Musciapa striata*) and wheatear (*Oenanthe oenanthe*).

In addition to the species listed below, 31 green-listed species were recorded during the breeding vantage point surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area. Most of these species are present throughout the year while some are summer visitors to Ireland.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded during vantage point surveys at Glenora during the breeding 2019 VP surveys.

Common Name	Scientific Name	Breeding Season 2019					
		Apr	May	Jun	Jul	Aug	Sep
Goldcrest	<i>Regulus regulus</i>	2	2	2	1	3	4
Grey Wagtail	<i>Motacilla cinerea</i>	-	-	-	-	-	1
House Martin	<i>Delichon urbicum</i>	1	-	-	-	-	39
Linnet	<i>Carduelis cannabina</i>	2	2	-	-	-	-
Meadow Pipit	<i>Anthus pratensis</i>	17	12	11	20	10	20
Sand Martin	<i>Riparia riparia</i>	1	-	-	-	-	-
Skylark	<i>Alauda arvensis</i>	8	9	8	12	-	5
Spotted flycatcher	<i>Musciapa striata</i>	-	-	-	-	-	1
Starling	<i>Sturnus vulgaris</i>	-	-	-	11	-	40
Swallow	<i>Hirundo rustica</i>	1	-	-	2	4	50
Swift	<i>Apus apus</i>	-	-	-	3	-	-
Wheatear	<i>Oenanthe oenanthe</i>	1	-	-	-	-	1

Winter 2019/2020

The following summary outlines all non-target species of conservation concern recorded during the winter 2019/2020 VP surveys.

Meadow pipit was the only non-target red-listed species which was recorded. Meadow pipit was recorded in every month throughout the site with numbers peaking in October and March. Amber-listed non-target species recorded in every month comprised goldcrest. Amber-listed species which were only recorded in one month comprised skylark and starling.

In addition to the species listed below, 23 green-listed species were recorded during the winter vantage point surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded during vantage point surveys at Glenora during the winter 2019/2020 VP surveys.

Common Name	Scientific Name	Winter season 2019/20					
		Oct	Nov	Dec	Jan	Feb	Mar
Goldcrest	<i>Regulus regulus</i>	4	2	1	2	1	2
Meadow Pipit	<i>Anthus pratensis</i>	10	1	1	8	1	10
Skylark	<i>Alauda arvensis</i>	-	-	-	-	-	8
Starling	<i>Sturnus vulgaris</i>	8	-	-	-	-	-

Breeding 2020

The following summary outlines all non-target species of conservation concern recorded during the breeding 2020 VP surveys.

Grey wagtail and meadow pipit were the only non-target red-listed species which were recorded. One grey wagtail was recorded in August and September only. Meadow pipit was recorded in every month throughout the site, with numbers peaking in September.

Amber-listed non-target species which were frequently recorded included skylark, swallow, willow warbler (*Phylloscopus trochilus*) and goldcrest, while other less frequently recorded species comprised linnet (*Carduelis cannabina*) and wheatear.

In addition to the species listed below, 30 green-listed species were recorded during the breeding VP surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area. Most of these species are present throughout the year while some are summer visitors to Ireland.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded during vantage point surveys at Glenora during the breeding 2020 VP surveys.

Common Name	Scientific Name	Breeding Season 2020					
		April	May	June	July	Aug	Sep
Goldcrest	<i>Regulus regulus</i>	1	1	2	5	3	8
Grey Wagtail	<i>Motacilla cinerea</i>	-	-	-	-	1	1
Linnet	<i>Carduelis cannabina</i>	-	-	-	-	-	1
Meadow Pipit	<i>Anthus pratensis</i>	12	17	12	16	32	72
Skylark	<i>Alauda arvensis</i>	8	8	12	10	4	4
Swallow	<i>Hirundo rustica</i>	2	2	-	17	5	1
Willow Warbler	<i>Phylloscopus trochilus</i>	6	5	4	3	1	-
Wheatear	<i>Oenanthe oenanthe</i>	1	1	-	-	-	1

Winter 2020/21

The following summary outlines all non-target species of conservation concern recorded during the winter 2020/2021 VP surveys.

Grey wagtail and meadow pipit were the only non-target red-listed species which were recorded. Grey wagtail was recorded in December and March only. Meadow pipit was recorded in every month throughout the site with numbers peaking in March.

Amber-listed non-target species recorded in every month included goldcrest. Amber-listed species which were less frequently recorded included skylark and starling.

In addition to the species listed below, 29 green-listed species were recorded during the winter VP surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area.

Common Name	Scientific Name	Winter Season 2020/21					
		Oct	Nov	Dec	Jan	Feb	Mar
Goldcrest	<i>Regulus regulus</i>	2	3	2	1	2	3
Grey Wagtail	<i>Motacilla cinerea</i>	-	-	1	-	-	2
Meadow Pipit	<i>Anthus pratensis</i>	10	3	2	3	16	31
Skylark	<i>Alauda arvensis</i>	-	-	-	-	3	4
Starling	<i>Sturnus vulgaris</i>	-	-	20	-	-	-

Breeding 2021

The following summary outlines all non-target species of conservation concern recorded during the breeding 2021 VP surveys.

Grey wagtail, meadow pipit and swift (*Apus apus*) were the non-target red-listed species which were recorded. Meadow pipit was the most frequent and abundant red listed species, recorded in every month with numbers peaking (110) in September. Grey wagtail was also recorded every month and numbers peaked in May (4). Swift was recorded only during July. Goldcrest was the only amber-listed non-target species recorded in every month. Other amber-listed species which were frequently recorded included skylark and willow warbler, while other less frequently recorded species comprised linnet, sand martin, swallow and wheatear (*Oenanthe oenanthe*).

In addition to those listed below, 29 green-listed species were recorded during the summer vantage point surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area. Most of these species are present throughout the year while some are summer visitors to Ireland.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded at Glenora during the breeding 2021 VP surveys.

Common Name	Scientific Name	Breeding Season 2021					
		April	May	June	July	Aug	Sep
Goldcrest	<i>Regulus regulus</i>	3	2	3	3	2	4
Grey Wagtail	<i>Motacilla cinerea</i>	1	4	2	1	2	1
Linnet	<i>Carduelis cannabina</i>	1	-	-	-	-	4
Meadow Pipit	<i>Anthus pratensis</i>	34	8	10	18	6	110
Sand Martin	<i>Riparia riparia</i>	1	1	-	4	-	1
Skylark	<i>Alauda arvensis</i>	10	10	10	10	-	3
Swallow	<i>Hirundo rustica</i>	-	-	-	4	12	5
Swift	<i>Apus apus</i>	-	-	-	1	-	-
Wheatear	<i>Oenanthe oenanthe</i>	2	-	-	2	2	1
Willow Warbler	<i>Phylloscopus trochilus</i>	6	6	2	3	1	-

Winter 2021/22

The following summary outlines all non-target species of conservation concern recorded during the winter 2021/22 VP surveys.

Grey wagtail, meadow pipit and redwing comprised the non-target red-listed species which were recorded. Meadow pipit was the most frequent and abundant red listed species, recorded in every month with numbers peaking in October (22). Redwing was the second most abundant, red-listed species, recorded in October (20) and November (1). Grey wagtail was recorded once in October and once in March.

Goldcrest was the only amber-listed non-target species recorded in every month. Less frequently recorded species comprised linnets and skylark. In addition to those listed below, 25 green-listed species were recorded during the 2021/22 VP surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded at Glenora during the winter 2021/22 VP surveys.

Common Name	Scientific Name	Winter Season 2021/22					
		Oct	Nov	Dec	Jan	Feb	Mar
Goldcrest	<i>Regulus regulus</i>	2	2	1	2	3	4
Grey Wagtail	<i>Motacilla cinerea</i>	1	-	-	-	-	1
Linnet	<i>Carduelis cannabina</i>	1	-	-	-	-	-
Meadow Pipit	<i>Anthus pratensis</i>	22	13	3	16	6	10
Redwing	<i>Turdus iliacus</i>	20	1	-	-	-	-
Skylark	<i>Alauda arvensis</i>	4	-	-	-	-	4

Breeding 2022

The following summary outlines all non-target species of conservation concern recorded during the breeding 2022 VP surveys.

Grey wagtail, meadow pipit and swift were the non-target red-listed species which were recorded. Meadow pipit was the most frequent and abundant red listed species, recorded in every month with numbers peaking in August (25). Grey wagtail was recorded in every month, with numbers peaking in June (3) and August (3). Swift was only recorded in July (2).

Goldcrest and skylark were the only amber-listed non-target species recorded in every month. Swallow was the most abundantly recorded species in any month, with a peak count in August (26). Less frequently recorded species comprised wheatear, house martin and linnet, among others.

In addition to those listed below, 25 green-listed non-target species were recorded during the breeding 2022 VP surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded at Glenora during the breeding 2022 VP surveys.

Common Name	Scientific Name	Breeding Season 2022					
		April	May	June	July	Aug	Sep
Goldcrest	<i>Regulus regulus</i>	3	2	2	5	3	3
Grey Wagtail	<i>Motacilla cinerea</i>	1	2	3	2	3	1
House Martin	<i>Delichon urbicum</i>	-	1	-	-	5	4
Linnet	<i>Carduelis cannabina</i>	-	-	-	-	-	1
Meadow Pipit	<i>Anthus pratensis</i>	9	8	10	12	25	37
Sand Martin	<i>Riparia riparia</i>	-	-	-	-	1	-
Skylark	<i>Alauda arvensis</i>	3	4	6	5	3	4
Swallow	<i>Hirundo rustica</i>	-	2	-	2	26	12
Swift	<i>Apus apus</i>	-	-	1	2	-	-
Wheatear	<i>Oenanthe oenanthe</i>	-	2	2	-	1	-
Willow Warbler	<i>Phylloscopus trochilus</i>	3	4	2	3	3	-

Winter 2022/23

The following summary outlines all non-target species of conservation concern recorded during the winter 2022/23 VP surveys.

Grey wagtail, meadow pipit and redwing comprised the red-listed species which were recorded. Meadow pipit was the most frequent and abundant, red-listed species. It was recorded in every month, with numbers peaking in October and February (12). Redwing was the second most abundant, red-listed species, recorded in October (1), November (8) and December (2). Grey wagtail was recorded once in October 2022.

Goldcrest and skylark were the only amber-listed non-target species recorded. Goldcrest was recorded in every month, while skylark was recorded in October 2022 and February and March 2023.

In addition to those listed below, 22 green-listed species were recorded during the winter 2022/23 VP surveys. Most of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded at Glenora during the winter 2022/23 VP surveys.

Common Name	Scientific Name	Winter Season 2022/23					
		Oct	Nov	Dec	Jan	Feb	Mar
Goldcrest	<i>Regulus regulus</i>	2	2	3	1	3	-
Grey Wagtail	<i>Motacilla cinerea</i>	1	-	-	-	-	-
Meadow Pipit	<i>Anthus pratensis</i>	12	5	4	2	12	6
Redwing	<i>Turdus iliacus</i>	1	8	2	-	-	-
Skylark	<i>Alauda arvensis</i>	3	-	-	-	2	6

Appendix 7

Transect Survey Summary

Glenora Transect Survey Summary

Breeding 2019

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	April	16.04.19	SC & JC	19:00	21:05	Cloud cover 5/8, intermediate sunshine and cloud. Wind SE F1-3, temp 11°C	Good
B	April	17.04.19	SC & JC	18:45	19:40	Cloud cover 3/8, mostly sunny. Wind SE F2-4, temp 14-15°C	Good
A	May	23.05.19	SC & AC	13:55	16:15	Cloud cover 8/8, mostly overcast and warm. Wind ENE-NE F1-2, temp 16-15°C	Good
B	May	23.05.19	SC & AC	16:30	18:15	Cloud cover 8/8, overcast with some spitting rain. Wind NE F0-1 Temp 15-14°C	Good
A	June	19.06.19	SC	20:12	22:10	Cloud cover 6/8 – 5/8, mostly sunny spells with odd shower. Wind W F2-4, temp 10-9°C	Good
B	June	20.06.19	SC & JC	14:15	16:06	Cloud cover 6/8, sunshine and showers. Wind W F1-3, temp 14°C	Good
A	August	17.08.19	SC & JC	09:40	11:10	Cloud cover 8/8 dense fog, persistent misty rain at times. Wind SW F2-4, temp 15°C	Poor
B	July	17.07.19	AC	12:35	13:52	Cloud cover 8/8, rain and mist. Wind W F3-5, temp 16°C	Poor
A	August	22.08.19	SC	11:05	12:46	Cloud cover 8/8 continuously misty. Wind S F4, temp 14°C	Poor
B	August	22.08.19	AC	14:05	16:00	Cloud cover 8/8, rain and mist. Wind S F4-5, temp 16-17°C.	Moderate
A	September	20.09.19	SC	13:00	14:47	Cloud cover 0/8, clear blue skies, sunshine and windy. Wind SE F3-5 gusts F6, temp 16-19°C	Good
B	September	20.09.19	JC	13:00	14:30	Cloud cover 2/8, sunny. Wind SE F5, temp 17-19°C	Good

Winter 2019/2020

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	October	15.10.19	JC	14:00	16:30	Light rain and fog, wind SW F3-5, temp 9-12°C	Good-Moderate.
B	October	15.10.19	SC	11:00	12:37	Cloud cover 8/8, overcast but bright. Wind SSE F3-4, temp 10-12 °C	Good
A	November	19.11.19	JC	13:45	16:15	Cloud cover 5/8, dry. Wind NF2-3, temp 8°C	Good
B	November	19.11.19	SC	10:40	12:19	Cloud cover 6/8 – 2/8, cloudy with sunny spells to mostly sunny. Wind SE F0-1 Temp 7-8°C	Good
A	December	19.12.19	JC	10:00	12:30	Cloud cover 6/8, dry with sunshine. Wind SE F2-4, temp 4-6°C	Good
B	December	19.12.19	SC	13:30	15:00	Cloud cover 3/8, mostly sunny. Wind S F2-3, temp 8°C a	Good
A	January	21.01.20	JC	09:20	12:00	Cloud cover 7/8. Wind SW F3-5, temp 7-9°C	Good-Moderate.
B	January	21.01.20	SC	13:20	15:00	Cloud cover 8/8, rain and mist, overcast with low cloud. Wind WSW F2--3 temp 10°C	Poor
A	February	18.02.20	JC	11:30	14:00	Cloud cover 8/8 intermittent heavy hail. Wind SW F5-8, temp 2°C	Poor- Moderate.
B	February	18.02.20	SC	10:10	16:36	Cloud cover 4/8, intermittent heavy hail/sleet showers. Wind W F5-7, temp 5°C	Good
A	March	27.03.20	JM	09:00	10:00	A fine dry sunny morning. Wind N-E F2-4, temp 8-10°C	Good
B	March	27.03.20	AC	09:10	11:20	Cloud cover 0/8 and sunshine. Wind NE F3-4, temp 7-9°C	Good

Breeding 2020

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	May	11.05.20	AC	12:25	14:35	Cloud cover 7/8 - 5/8, sunshine. Wind NE F4-5, temp 8-10°C	Good
B	May	11.05.20	AC	09:50	12:05	Cloud cover 8/8- 7/8, intermittent sunshine. Wind NE F3-4, temp 7-10°C	Good
A	May	27.05.20	AC	09:15	11:40	Cloud cover 8/8, hazy sunshine. Wind SE F2-3, temp 12-16 °C	Good
B	May	25.05.20	AC	13:00	15:15	Cloud cover 8/8, continuous light rain. Wind S F4-6, Temp 13°C	Good
A	June	22.06.20	AC	09:00	11:30	Cloud cover 8/8, mist. Wind SW F4-5, temp 13 °C	Poor
B	June	19.06.20	AC	12:45	14:45	Cloud cover 8/8, rain showers. Wind SW F3-4, temp 14-15 °C	Good
A	July	29.07.20	AC	08:45	11:45	Cloud cover 8/8, intermittent hazy sunshine. Wind SE F3-4, temp 12-13 °C	Good
B	July	29.07.20	AC	12:00	14:00	Cloud cover 8/8, intermittent hazy sunshine. Wind SE F3-4, temp 14-16 °C	Poor
A	August	03.09.20	AC	09:30	12:20	Cloud cover 7/8- 8/8, intermittent sunshine and rain showers. Wind SW F5-6, temp 14 °C	Good
B	August	03.09.20	AC	12:35	14:06	Cloud cover 8/8, intermittent sunshine. Wind SW F5-6, temp 14°C	Good
A	September	25.09.20	PC	09:00	11:30	Dry, dull. Wind NW, F2-3, temp 12°C	Moderate
B	September	25.09.20	AC	13:00	15:00	Cloud cover 6/8, sunshine. Wind N F4-5, temp 13-14°C	Good

Winter 2020/21

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	October	28.10.20	PC	12:00	15:00	Persistent showers, cloudy, hail stone, sunshine. Wind WSW and F4-6.	
B	October	28.10.20	AC	12:10	13:55	Cloud cover 6/8- 8/8, rain showers, hail showers from 13:00- 13:55, intermittent sunshine. Wind SW F4-5, temp 10-8°C	Moderate - Poor
A	November	27.11.20	PC	08:30	11:00	Dry, dull, foggy and cloudy. Wind SE F2-3, temp 6°C	Moderate - Poor
B	November	27.11.20	PC	12:20	14:10	Cloud cover 8/8. Wind SSE, F3-4, Temp 7-8°C	Good
A	December	18.12.20	PC	12:15	15:00	Dull, cloudy, consistent showers. Wind SW F4-5, temp 8°C and visibility moderate.	Moderate
B	December	18.12.20	AC	09:10	11:10	Cloud cover 8/8 – 7/8, intermittent sunshine, rain showers. Wind SSW F4-5, temp 8°C	Moderate - Poor
A	January	21.01.21	PC	09:00	11:30	Dry, dull and cloudy. Wind SW F1-2, temp 2°C.	Good
B	January	25/01/2021	AC	13:00	14:55	Cloud cover 8/8 – 6/8, intermittent sunshine and sleet showers. Wind S F1-2, temp 2-3°C	Good
A	February	24/02/2021	PC	14:00	16:30	Dry, sunny and cloudy. Wind SW F6-8	Good
B	February	24.02.21	LOD	14:30	16:00	Dry and windy. Wind SW F6	Moderate
A	March	13.03.21	PC	08:30	11:30	Dry, dull, intermittent heavy showers (towards end of transect) and cloudy. Wind N, F2, temp 7°C	Moderate
B	March	31.03.21	AC	11:50	13:35	Cloud cover 8/8, mist and rain. Wind NNE F3-4, temp 7°C	Poor - Moderate

Breeding 2021

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	April	27.04.21	PC	06.15	09.15	Dry with 80% cloud cover, wind direction northwest, wind F4-6, temp 9°C.	Good.
B	April	27.04.21	AC	14.45	16.35	Cloud cover 8/8 with intermittent sunshine, wind direction north-northeast, wind F4-6, temp 9°C.	Good.
A	June	21.06.21	PC	08.45	11.45	Dry and sunny, wind direction north, wind F3-4 but F4-6 at some exposed VP's, temp 11°C.	Good.
B	June	21.06.21	PC	12.15	14.15	Dry and sunny, wind direction north, wind F-5, temp 15°C.	Good.
A	August	18.08.21	PC	10.30	13.30	Dull and overcast with consistent light rain, wind direction west, wind F2, temp 13°C.	Moderate
B	August	30.08.21	PC	12.30	14.30	Dry, overcast and dull, wind direction northeast, wind F1-2, temp 18°C.	Good.

Winter 2021/22

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	October	22.10.21	SC	15.20	17.05	An overcast day with heavy cloud, 8/8, and West/South-west to South-west winds F3-4. Temperature 12-11°C.	Good
B	October	22.10.21	SC	17.10	18.30	An overcast evening with light mist, heavy cloud, 8/8 and South-westerly winds F2-3. Temperature 10°C	Good
A	December	06.12.21	SC	15.00	16.40	A cloudy evening with heavy hail and sleet, intermittent sunshine and strong South-westerly winds F7. Temperature 3-4°C.	Good
B	December	06.12.21	SC	13.30	14.50	A cloudy afternoon with heavy prolonged hail and sleet, intermittent sunshine and strong South-westerly winds F7. Temperature 3-4°C.	Moderate
A	January	19.01.22	PC	08.15	10.20	A dull cloudy morning with some rain (0.1 mm). Cloud cover 8/8. South-easterly winds F4-6. Temperature 7°C.	Good
B	January	12.01.22	PC	15.00	16.45	Nice bright evening. Cloud cover 7/8. Westerly winds F1-3. Temperature 7°C.	Good

Breeding 2022

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	June	02.06.22	SC	11.50	13.50	Mostly overcast with some sunny spells with the occasional shower. Cloud cover 7/8. West winds F3-4. Temperature 14-15°C.	Good
B	June	02.06.22	SC	14.00	15.25	Mostly cloudy, warm with occasional showers. Cloud cover 8/8. Westerly winds F3-4. Temperature 16°C	Good
A	July	19.07.22	SC	10.10	13.30	An overcast dull day with light rain. Cloud cover 8/8. North-westerly winds F3-4. Temperature 16-15°C.	Good
B	July	19.07.22	SC	14.00	15.45	An overcast day with some light rain. Cloud cover 8/8. North-westerly winds F3. Temperature 15°C.	Good
A	September	07.09.22	PC	09.00	11.00	Cloud cover 7/8. Easterly winds F 1-2. 0.1 mm rain. Temperature 17°C.	Good
B	September	08.09.22	PC	08.00	11.00	Cloud cover 6/8. Easterly winds F 2-3. 0.1 mm rain. Temperature 16°C.	Good

Winter 2022/23

Transects	Month	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	November	16.11.22	PC	09.00	11.00	Dry day, cloud 66-100, and southeast winds F1. Temperature 4°C.	Poor
B	November	15.11.22	PC	09.00	10.40	Dry day, cloud 66-100 and southeast winds F1. Temperature 4°C.	Good
A	February	09.02.23	PC	11.00	12.50	Light showers, cloud 0-33, westerly winds F2. Temperature 3-4°C.	Good
B	February	14.02.23	PC	10.40	12.10	Light showers, cloud 66-100 and south- winds F5-6. Temperature 10°C.	Moderate
A	March	02.03.23	SC	13.50	15.15	Dry overcast day, cloud 66-100 and easterly winds F2-4. Temperature 6°C.	Good
B	March	24.03.23	SC	16.30	18.00	Damp day. Cloud cover 8/8. West north-westerly winds F4-5. Temperature 7°C.	Good

Appendix 8
Transect Survey Results

TRANSECT/POINT COUNT SURVEY RESULTS

The following tables outline peak counts of all species recorded during the Transect A or Transect B surveys (TA or TB) and Point Count surveys undertaken within the proposed wind farm site between April 2019 and March 2023. The names of species are colour-coded to indicate conservation status as determined in the most recent assessment of all regularly occurring birds in Ireland.

Breeding 2019

Common Name	Latin Name	Breeding Season 2019											
		April TA	April TB	May TA	May TB	June TA	June TB	July TA	July TB	Aug TA	Aug TB	Sept TA	Sept TB
Blackbird	<i>Turdus merula</i>	2	2	3	-	1	-	-	2	-	-	-	-
Blackcap	<i>Sylvia atricapilla</i>	-	-	2	-	1	1	-	-	-	-	-	-
Blue tit	<i>Parus caeruleus</i>	2	1	-	1	-	-	-	1	-	1	2	-
Bullfinch	<i>Pyrrhula pyrrhula</i>	-	-	-	-	-	-	2	-	1	2	-	-
Buzzard	<i>Buteo buteo</i>	-	-	-	-	1	-	-	-	-	-	-	-
Chaffinch	<i>Fringilla coelebs</i>	5	3	4	2	6	4	3	3	-	3	-	-
Chiffchaff	<i>Phylloscopus collybita</i>	-	-	3	-	-	-	-	-	-	-	-	-
Coal tit	<i>Periparus ater</i>	1	2	1	1	1	3	1	2	4	1	5	5
Crossbill	<i>Loxia curvirostra</i>	4	-	-	-	-	-	-	-	-	-	-	-
Cuckoo	<i>Cuculus canorus</i>	-	-	1	1	-	-	-	-	-	-	-	-
Dunnock	<i>Prunella modularis</i>	1	-	1	1	1	-	1	-	1	1	-	-
Goldcrest	<i>Regulus regulus</i>	3	3	2	5	3	4	3	2	3	3	5	-

Common Name	Latin Name	Breeding Season 2019											
		April TA	April TB	May TA	May TB	June TA	June TB	July TA	July TB	Aug TA	Aug TB	Sept TA	Sept TB
Goldfinch	<i>Carduelis carduelis</i>	-	-	-	-	-	-	-	2	-	-	-	-
Grasshopper Warbler	<i>Locustella naevia</i>	-	-	-	-	-	-	1	1	1	-	-	-
Great tit	<i>Parus major</i>	-	-	-	1	-	-	-	-	-	-	1	-
Grey wagtail	<i>Motacilla cinerea</i>	-	1	1	1	-	-	-	-	-	-	-	-
Hooded crow	<i>Corvus cornix</i>	-	-	1	-	-	-	-	-	-	-	-	-
House martin	<i>Delichon urbicum</i>	-	-	-	-	-	-	-	-	-	-	25	-
Mallard	<i>Anas platyrhynchos</i>	1	-	-	-	-	-	-	-	-	-	-	-
Meadow pipit	<i>Anthus pratensis</i>	2	1	3	2	4	1	2	4	-	-	2	3
Mistle thrush	<i>Turdus viscivorus</i>	-	-	-	-	-	-	-	1	-	1	-	-
Raven	<i>Corvus corax</i>	1	-	-	-	-	-	1	-	-	-	1	1
Redpoll	<i>Carduelis flammea cabaret</i>	6	4	1	-	-	-	-	4	-	-	-	-
Robin	<i>Erithacus rubecula</i>	4	2	4	3	4	3	2	-	1	2	2	1
Rook	<i>Corvus frugilegus</i>	-	-	-	-	-	-	-	-	1	-	-	-
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	-	-	2	-	2	-	-	-	-	-	-	-
Siskin	<i>Carduelis spinus</i>	2	2	3	3	2	1	2	2	-	-	3	2
Snipe	<i>Gallinago gallinago</i>	-	1	-	-	-	-	-	-	-	-	-	-
Song thrush	<i>Turdus philomelos</i>	2	1	1	-	1	-	-	-	-	-	-	-
Sparrowhawk	<i>Accipiter nisus</i>	1	-	-	-	-	1	-	-	-	-	2	-

Common Name	Latin Name	Breeding Season 2019											
		April TA	April TB	May TA	May TB	June TA	June TB	July TA	July TB	Aug TA	Aug TB	Sept TA	Sept TB
Swallow	<i>Hirundo rustica</i>	-	-	1	1	-	-	-	-	-	-	5	-
Willow Warbler	<i>Phylloscopus trochilus</i>	4	4	8	5	5	3	2	-	1	1	-	-
Woodpigeon	<i>Columba palumbus</i>	1	2	-	7	2	1	1	-	-	-	-	-
Wren	<i>Troglodytes troglodytes</i>	4	2	3	3	3	3	4	1	3	5	2	2

Winter 2019/2020

Common Name	Latin Name	Winter Season 2019/2020											
		Oct TA	Oct TB	Nov TA	Nov TB	Dec TA	Dec TB	Jan TA	Jan TB	Feb TA	Feb TB	Mar TA	Mar TB
Blackbird	<i>Turdus merula</i>	-	-	1	3	-	-	1	-	-	-	-	1
Blue tit	<i>Parus caeruleus</i>	-	-	-	3	-	-	-	-	-	-	2	2
Bullfinch	<i>Pyrrhula pyrrhula</i>	-	-	1	1	-	1	1	-	-	-	2	2
Chaffinch	<i>Fringilla coelebs</i>	-	-	-	2	-	-	-	-	-	-	5	4
Coal tit	<i>Periparus ater</i>	2	1	4	4	1	6	3	3	1	2	2	3
Crossbill	<i>Loxia curvirostra</i>	2	8	1	-	9	-	6	5	2	1	4	-
Dunnock	<i>Prunella modularis</i>	1	2	-	2	-	1	-	-	-	-	2	-
Goldcrest	<i>Regulus regulus</i>	2	3	5	2	-	3	2	2	1	1	2	2
Goldfinch	<i>Carduelis carduelis</i>	-	-	-	-	-	-	-	1	-	-	-	-
Great tit	<i>Parus major</i>	-	-	-	-	1	-	-	-	-	-	3	-
Grey heron	<i>Ardea cinerea</i>	-	-	-	-	-	-	-	-	-	-	1	-
Jay	<i>Garrulus glandarius</i>	-	1	-	-	-	-	-	-	-	-	-	-
Kestrel	<i>Falco tinnunculus</i>	-	-	2	-	-	-	-	-	-	-	-	-
Meadow pipit	<i>Anthus pratensis</i>	-	2	-	-	-	-	-	-	-	-	3	-
Raven	<i>Corvus corax</i>	1	2	-	1	-	1	-	-	1	-	8	1
Reed bunting	<i>Emberzia schoenichus</i>	-	-	-	-	-	-	-	-	-	-	2	2

Common Name	Latin Name	Winter Season 2019/2020											
		Oct TA	Oct TB	Nov TA	Nov TB	Dec TA	Dec TB	Jan TA	Jan TB	Feb TA	Feb TB	Mar TA	Mar TB
Robin	<i>Erithacus rubecula</i>	1	4	1	3	1	3	1	2	1	1	2	3
Siskin	<i>Carduelis spinus</i>	-	-	-	1	-	1	-	1	-	-	5	4
Snipe	<i>Gallinago galinago</i>	-	-	-	-	-	-	1	-	-	-	1	-
Sparrowhawk	<i>Accipiter nisus</i>	1	-	-	-	-	-	-	-	-	-	-	-
Stonechat	<i>Saxicola torquatus</i>	1	-	-	-	-	-	2	-	-	-	2	-
Woodcock	<i>Scolopax rusticola</i>	-	-	1	1	-	1	1	-	-	-	-	-
Woodpigeon	<i>Columba palumbus</i>	-	-	1	-	-	-	-	-	-	-	1	2
Wren	<i>Troglodytes troglodytes</i>	3	3	3	5	1	3	2	1	1	1	3	4

Breeding 2020

Common Name	Latin Name	Breeding Season 2020											
		May TA	May TB	May TA	May TB	June TA	June TB	July TA	July TB	Aug TA	Aug TB	Sept TA	Sept TB
Blackbird	<i>Turdus merula</i>	2	2	2	2	-	1	2	-	-	-	-	-
Blackcap	<i>Sylvia atricapilla</i>	1	2	1	1	2	1	1	-	-	-	1	-
Blue tit	<i>Parus caeruleus</i>	-	-	-	2	-	-	1	-	-	-	2	-
Bullfinch	<i>Pyrrhula pyrrhula</i>	-	-	-	-	-	-	2	-	2	-	-	-
Buzzard	<i>Buteo buteo</i>	-	-	-	-	-	-	-	1	-	-	-	-
Chaffinch	<i>Fringilla coelebs</i>	4	4	2	2	3	2	5	2	-	2	-	2
Chiffchaff	<i>Phylloscopus collybita</i>	2	-	-	-	-	-	-	-	-	-	-	-
Coal tit	<i>Periparus ater</i>	4	4	2	2	1	1	2	1	3	1	2	1
Crossbill	<i>Loxia curvirostra</i>	8	6	2	2	4	5	2	2	-	-	-	-
Dunnock	<i>Prunella modularis</i>	-	1	1	1	1	-	-	-	-	-	2	-
Goldcrest	<i>Regulus regulus</i>	2	2	1	1	1	1	1	1	-	-	5	1
Grasshopper Warbler	<i>Locustella naevia</i>	-	-	-	-	1	-	-	-	-	-	-	-
Kestrel	<i>Falco tinnunculus</i>	-	-	-	-	-	-	-	-	-	1	-	-
Magpie	<i>Pica pica</i>	-	-	-	-	-	-	-	1	-	-	-	-
Meadow pipit	<i>Anthus pratensis</i>	2	-	2	-	2	-	10	-	2	-	4	-
Mistle thrush	<i>Turdus viscivorus</i>	2	2	-	2	2	-	-	-	1	-	-	-

Common Name	Latin Name	Breeding Season 2020											
		May TA	May TB	May TA	May TB	June TA	June TB	July TA	July TB	Aug TA	Aug TB	Sept TA	Sept TB
Raven	<i>Corvus corax</i>	-	-	-	-	-	-	9	-	3	2	1	-
Redpoll	<i>Carduelis flammea cabaret</i>	3	-	-	-	-	-	-	-	-	-	1	-
Reed bunting	<i>Emberzia schoenichus</i>	-	-	1	-	-	-	-	-	-	-	-	-
Reed warbler	<i>Acrocephalus scirpaceus</i>	-	1	-	-	-	-	-	-	-	-	-	-
Robin	<i>Erithacus rubecula</i>	2	2	4	1	1	-	1	-	1	1	3	1
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	2	-	1	-	1	-	-	-	1	-	-	-
Siskin	<i>Carduelis spinus</i>	2	7	4	4	4	3	-	-	1	2	-	-
Skylark	<i>Alauda arvensis</i>	-	2	-	-	-	-	-	-	-	-	-	-
Snipe	<i>Gallinago gallinago</i>	-	1	2	-	-	-	-	-	-	-	-	-
Song thrush	<i>Turdus philomelos</i>	-	-	-	-	1	-	-	-	-	-	-	-
Stonechat	<i>Saxicola torquatus</i>	-	-	-	-	-	-	-	-	-	3	1	2
Swift	<i>Apus apus</i>	-	-	-	-	-	-	2	-	-	-	-	-
Wheatear	<i>Oenanthe oenanthe</i>	1	-	-	-	-	-	-	-	1	-	-	-
Whitethroat	<i>Sylvia communis</i>	1	1	1	-	3	-	-	-	-	-	-	-
Willow Warbler	<i>Phylloscopus trochilus</i>	3	4	4	3	3	3	3	2	2	-	-	-
Woodpigeon	<i>Columba palumbus</i>	2	2	2	-	-	2	-	-	-	-	-	-
Wren	<i>Troglodytes troglodytes</i>	2	2	3	2	2	3	3	1	2	3	4	3

Winter 2020/21

Common Name	Latin Name	Winter Season 2020/2021											
		Oct TA	Oct TB	Nov TA	Nov TB	Dec TA	Dec TB	Jan TA	Jan TB	Feb TA	Feb TB	Mar TA	Mar TB
Blackbird	<i>Turdus merula</i>	-	-	-	-	1	-	-	-	-	-	1	-
Blue tit	<i>Parus caeruleus</i>	1	-	2	-	1	1	3	-	-	-	1	-
Bullfinch	<i>Pyrrhula pyrrhula</i>	-	-	2	-	-	-	1	-	-	-	1	-
Chaffinch	<i>Fringilla coelebs</i>	1	-	1	-	-	-	-	1	-	2	7	3
Coal tit	<i>Periparus ater</i>	4	1	2	1	4	2	7	1	1	5	5	2
Crossbill	<i>Loxia curvirostra</i>	-	-	-	-	-	2	-	-	-	3	6	4
Dunnock	<i>Prunella modularis</i>	1	-	1	-	1	2	1	-	-	-	1	-
Goldcrest	<i>Regulus regulus</i>	2	2	2	1	4	-	2	-	1	1	3	-
Great tit	<i>Parus major</i>	1	-	-	-	-	-	-	-	-	-	2	-
Grey wagtail	<i>Motacilla cinerea</i>	-	-	-	-	-	-	-	-	-	-	2	-
Jay	<i>Garrulus glandarius</i>	1	-	-	-	1	-	-	-	-	-	-	-
Kestrel	<i>Falco tinnunculus</i>	1	-	-	-	-	-	-	-	-	-	-	-
Long-tailed Tit	<i>Aegithalus caudatus</i>	-	-	10	-	6	-	-	-	-	-	-	-
Meadow pipit	<i>Anthus pratensis</i>	1	-	2	-	1	-	-	-	-	-	3	2
Raven	<i>Corvus corax</i>	-	1	1	-	2	2	2	-	-	1	-	1
Redpoll	<i>Carduelis flammea cabaret</i>	3	-	-	-	12	-	-	-	-	-	-	-

Common Name	Latin Name	Winter Season 2020/2021											
		Oct TA	Oct TB	Nov TA	Nov TB	Dec TA	Dec TB	Jan TA	Jan TB	Feb TA	Feb TB	Mar TA	Mar TB
Reed bunting	<i>Emberzia schoenichus</i>	-	-	-	-	-	-	2	2	-	-	-	-
Robin	<i>Erithacus rubecula</i>	2	-	3	-	2	2	1	3	2	2	4	1
Siskin	<i>Carduelis spinus</i>	-	-	-	-	-	-	-	-	-	-	2	-
Song thrush	<i>Turdus philomelos</i>	-	-	-	-	-	-	1	-	-	-	1	-
Sparrowhawk	<i>Accipiter nisus</i>	-	-	-	1	-	-	-	-	-	-	-	-
Stonechat	<i>Saxicola torquatus</i>	-	1	-	-	-	-	-	-	-	-	-	-
Woodcock	<i>Scolopax rusticola</i>	-	1	-	-	-	-	-	-	-	-	1	-
Woodpigeon	<i>Columba palumbus</i>	-	-	-	-	-	-	-	-	-	-	2	-
Wren	<i>Troglodytes troglodytes</i>	2	1	3	3	2	2	3	1	2	-	4	3

Breeding 2021

Common Name	Latin Name	Breeding Season 2021					
		April TA	April TB	June TA	June TB	Aug TA	Aug TB
Blackbird	<i>Turdus merula</i>	1	-	2	1	1	-
Blackcap	<i>Sylvia atricapilla</i>	-	-	4	1	2	-
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	-	-	-	3	1
Chaffinch	<i>Fringilla coelebs</i>	7	4	5	1	3	-
Coal Tit	<i>Parus ater</i>	4	2	6	1	2	3
Crossbill	<i>Loxia curvirostra</i>	-	-	-	1	-	-
Dunnock	<i>Prunella modularis</i>	-	2	1	-	1	3
Goldcrest	<i>Regulus regulus</i>	2	1	3	1	2	2
Grasshopper Warbler	<i>Locustella naevia</i>	-	-	1	-	-	-
Grey Wagtail	<i>Motacilla cinerea</i>	2	2	1	-	-	-
Jay	<i>Garrulus glandarius</i>	-	-	1	-	-	-
Meadow Pipit	<i>Anthus pratensis</i>	23	2	2	4	13	1
Mistle Thrush	<i>Turdus viscivorus</i>	-	-	-	1	-	-
Raven	<i>Corvus corax</i>	-	1	-	-	5	-
Redpoll	<i>Carduelis flammea cabaret</i>	1	-	-	-	-	-
Reed Bunting	<i>Emberzia schoenichus</i>	-	1	-	-	-	-

Common Name	Latin Name	Breeding Season 2021					
		April TA	April TB	June TA	June TB	Aug TA	Aug TB
Robin	<i>Erithacus rubecula</i>	2	1	3	1	2	2
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	-	-	1	-	-	-
Siskin	<i>Carduelis spinus</i>	4	3	3	2	2	-
Skylark	<i>Alauda arvensis</i>	-	-	-	1	-	-
Song Thrush	<i>Turdus philomelos</i>	-	-	1	1	-	-
Stonechat	<i>Saxicola torquatus</i>	2	2	1	-	-	-
Swallow	<i>Hirundo rustica</i>	-	-	-	-	-	1
Willow Warbler	<i>Phylloscopus trochilus</i>	5	3	9	5	2	-
Woodpigeon	<i>Columba palumbus</i>	4	-	1	-	-	-
Wren	<i>Troglodytes troglodytes</i>	3	2	6	3	10	6

Winter 2021/2022

Common Name	Latin Name	Winter Season 2021/2022					
		Oct TA	Oct TB	Dec TA	Dec TB	Jan TA	Jan TB
Blackbird	<i>Turdus merula</i>	-	1	1	-	1	-
Blue Tit	<i>Cyanistes caeruleus</i>	-	2	2	-	1	1
Bullfinch	<i>Pyrrhula pyrrhula</i>	-	-	-	-	1	1
Chaffinch	<i>Fringilla coelebs</i>	-	-	-	-	2	-
Coal Tit	<i>Periparus ater</i>	2	2	1	2	4	1
Dunnock	<i>Prunella modularis</i>	-	1	1	-	1	1
Goldcrest	<i>Regulus regulus</i>	2	3	1	2	5	1
Golden Plover	<i>Pluvialis apricaria</i>	-	-	-	-	-	1
Goldfinch	<i>Carduelis carduelis</i>	-	-	-	1	-	-
Great Tit	<i>Parus major</i>	-	-	-	-	1	-
Grey Wagtail	<i>Motacilla cinerea</i>	-	-	-	-	-	1
Hooded Crow	<i>Corvus cornix</i>	-	-	-	-	1	-
Jay	<i>Garrulus glandarius</i>	-	-	-	-	1	-
Meadow Pipit	<i>Anthus pratensis</i>	1	1	3	1	1	1
Mistle Thrush	<i>Turdus viscivorus</i>	-	-	6	-	-	-
Raven	<i>Corvus corax</i>	5	1	3	2	2	2
Redwing	<i>Turdus iliacus</i>	1	-	2	-	-	-
Reed Bunting	<i>Emberiza schoenicus</i>	-	-	-	-	1	1
Robin	<i>Erithacus rubecula</i>	3	4	2	1	4	2
Siskin	<i>Carduelis spinus</i>	11	1	5	1	-	-
Snipe	<i>Gallinago gallinago</i>	-	1	-	-	-	-
Song Thrush	<i>Turdus philomelos</i>	-	-	-	-	1	-

Common Name	Latin Name	Winter Season 2021/2022					
		Oct TA	Oct TB	Dec TA	Dec TB	Jan TA	Jan TB
Stonechat	<i>Saxicola torquatus</i>	-	-	-	1	-	-
Woodcock	<i>Scolopax rusticola</i>	-	-	1	-	1	1
Wren	<i>Troglodytes troglodytes</i>	5	6	2	1	3	4

Breeding 2022

Common Name	Latin Name	Breeding Season 2022					
		June TA	June TB	July TA	July TB	Sept TA	Sept TB
Blackbird	<i>Turdus merula</i>	2	-	1	1	1	1
Blackcap	<i>Sylvia atricapilla</i>	2	-	-	2	-	1
Blue Tit	<i>Parus caeruleus</i>	-	-	-	2	-	1
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	-	2	-	-	-
Chaffinch	<i>Fringilla coelebs</i>	3	2	12	2	-	1
Coal Tit	<i>Parus ater</i>	2	2	3	3	4	4
Crossbill	<i>Loxia curvirostra</i>	-	-	3	2	-	5
Dunnock	<i>Prunella modularis</i>	1	1	1	1	2	3
Goldcrest	<i>Regulus regulus</i>	2	4	4	6	5	6
Grasshopper Warbler	<i>Locustella naevia</i>	-	-	1	-	-	-
Great Tit	<i>Parus major</i>	-	-	-	1	-	-
Grey Wagtail	<i>Motacilla cinerea</i>	1	1	1	1	-	-
Jay	<i>Garrulus glandarius</i>	-	-	2	-	1	-
Long-tailed Tit	<i>Aegithalus caudatus</i>	-	-	-	-	8	-
Meadow Pipit	<i>Anthus pratensis</i>	4	2	4	4	12	3
Raven	<i>Corvus corax</i>	-	2	-	-	1	1

Common Name	Latin Name	Breeding Season 2022					
		June TA	June TB	July TA	July TB	Sept TA	Sept TB
Robin	<i>Erithacus rubecula</i>	4	2	5	3	3	6
Rook	<i>Corvus frugilegus</i>	1	-	-	-	-	-
Siskin	<i>Carduelis spinus</i>	3	1	2	2	2	-
Song Thrush	<i>Turdus philomelos</i>	-	-	-	-	-	1
Sparrowhawk	<i>Accipiter nisus</i>	-	-	2	-	1	1
Stonechat	<i>Saxicola torquatus</i>	-	-	1	-	-	-
Swallow	<i>Hirundo rustica</i>	-	-	-	-	1	3
Whitethroat	<i>Sylvia communis</i>	1	-	-	-	-	-
Willow Warbler	<i>Phylloscopus trochilus</i>	4	3	4	3	-	-
Woodpigeon	<i>Columba palumbus</i>	2	2	2	-	-	-
Wren	<i>Troglodytes troglodytes</i>	4	3	5	4	6	8

Winter 2022/2023

Common Name	Latin Name	Winter Season 2022/2023					
		Nov TA	Nov TB	Feb TA	Feb TB	March TA	March TB
Blackbird	<i>Turdus merula</i>	2	1	-	2	-	-
Blue Tit	<i>Parus caeruleus</i>	4	-	-	-	-	-
Chaffinch	<i>Fringilla coelebs</i>	1	1	1	-	1	-
Coal Tit	<i>Parus ater</i>	3	4	2	4	3	1
Crossbill	<i>Laxia curvirostra</i>	-	3	-	-	4	-
Dunnock	<i>Prunella modularis</i>	2	3	1	-	-	-
Goldcrest	<i>Regulus regulus</i>	4	2	2	2	1	2
Great Tit	<i>Parus major</i>	2	-	1	-	-	-
Hooded Crow	<i>Corvus cornix</i>	-	3	-	-	-	-
Jay	<i>Garrulus glandarius</i>	2	1	-	-	-	-
Kestrel	<i>Falco tinnunculus</i>	1	-	-	-	-	-
Meadow Pipit	<i>Anthus pratensis</i>	2	1	1	1	-	-
Raven	<i>Corvus corax</i>	1	1	-	1	1	1
Redpoll	<i>Carduelis flammea</i>	-	-	2	-	-	-
Redwing	<i>Turdus iliacus</i>	-	47	-	-	-	-
Reed Bunting	<i>Emberzia schoenichus</i>	2	2	-	-	-	-
Robin	<i>Erithacus rubecula</i>	4	5	1	2	1	1
Siskin	<i>Carduelis spinus</i>	6	-	-	-	3	-
Song Thrush	<i>Turdus philomelos</i>	3	-	-	-	-	-
Woodcock	<i>Scolopax rusticola</i>	1	-	-	1	-	-
Woodpigeon	<i>Columba palumbus</i>	-	-	-	-	1	1
Wren	<i>Troglodytes troglodytes</i>	5	4	4	2	1	2

Appendix 9

**Winter Walkover Survey Summaries
and Results**

Winter Walkover Survey Summaries and Results

Winter 2019/20

Survey Summary & Results

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility	Results
A	21.02.20	JC	10:00	12:00	Intermittent hail and snow. W wind f5-f7. Moderate visibility with no rain but with snow and hail. Temperature 4-5°.	Moderate	No target species observed.
B	21.02.20	SC	10:00	13:30	Intermittent hail and snow. W wind f5-f7. Moderate visibility with no rain but with snow and hail. Temperature 4-5°.	Moderate	No target species observed.

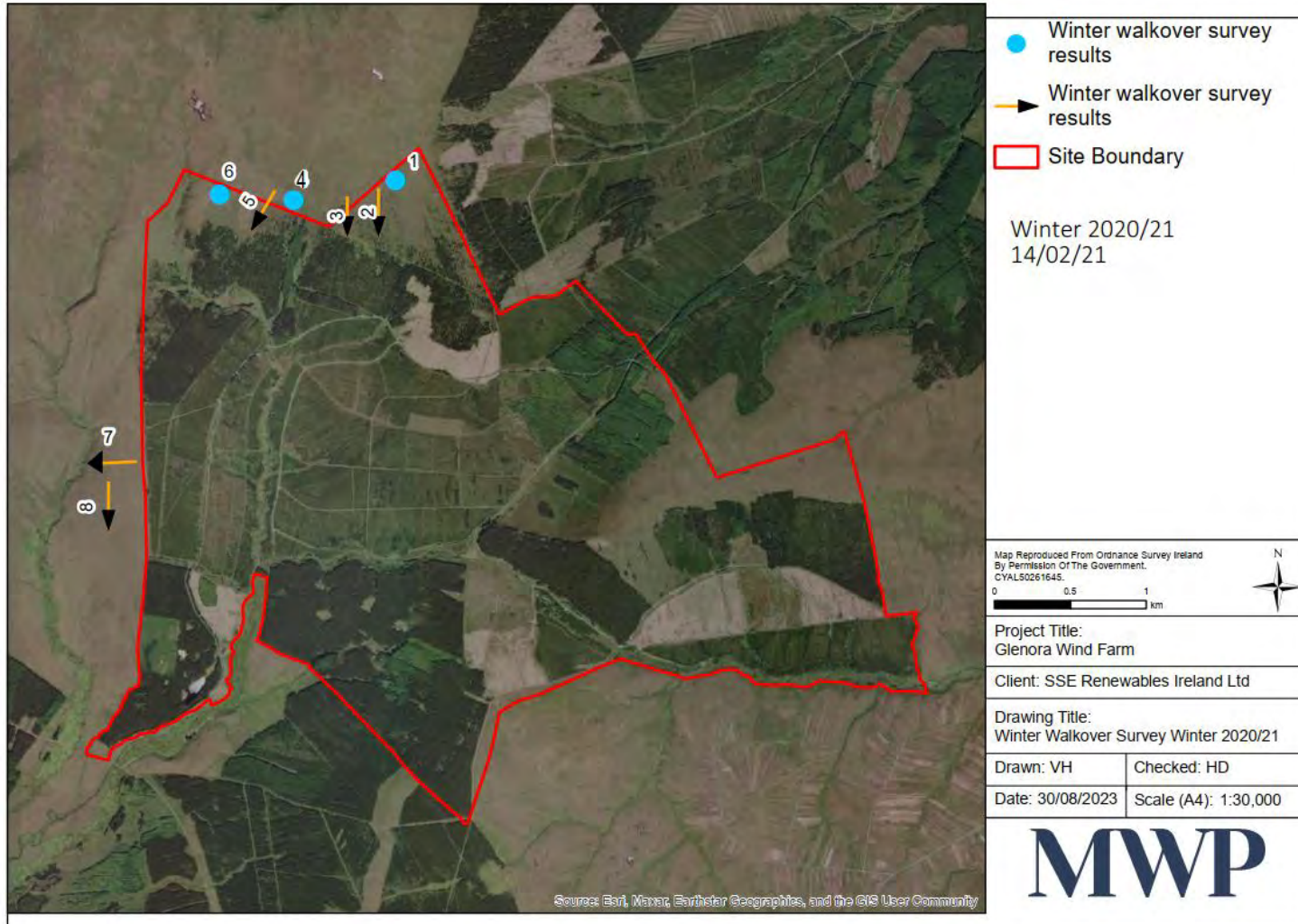
Winter 2020/21

Survey Summary

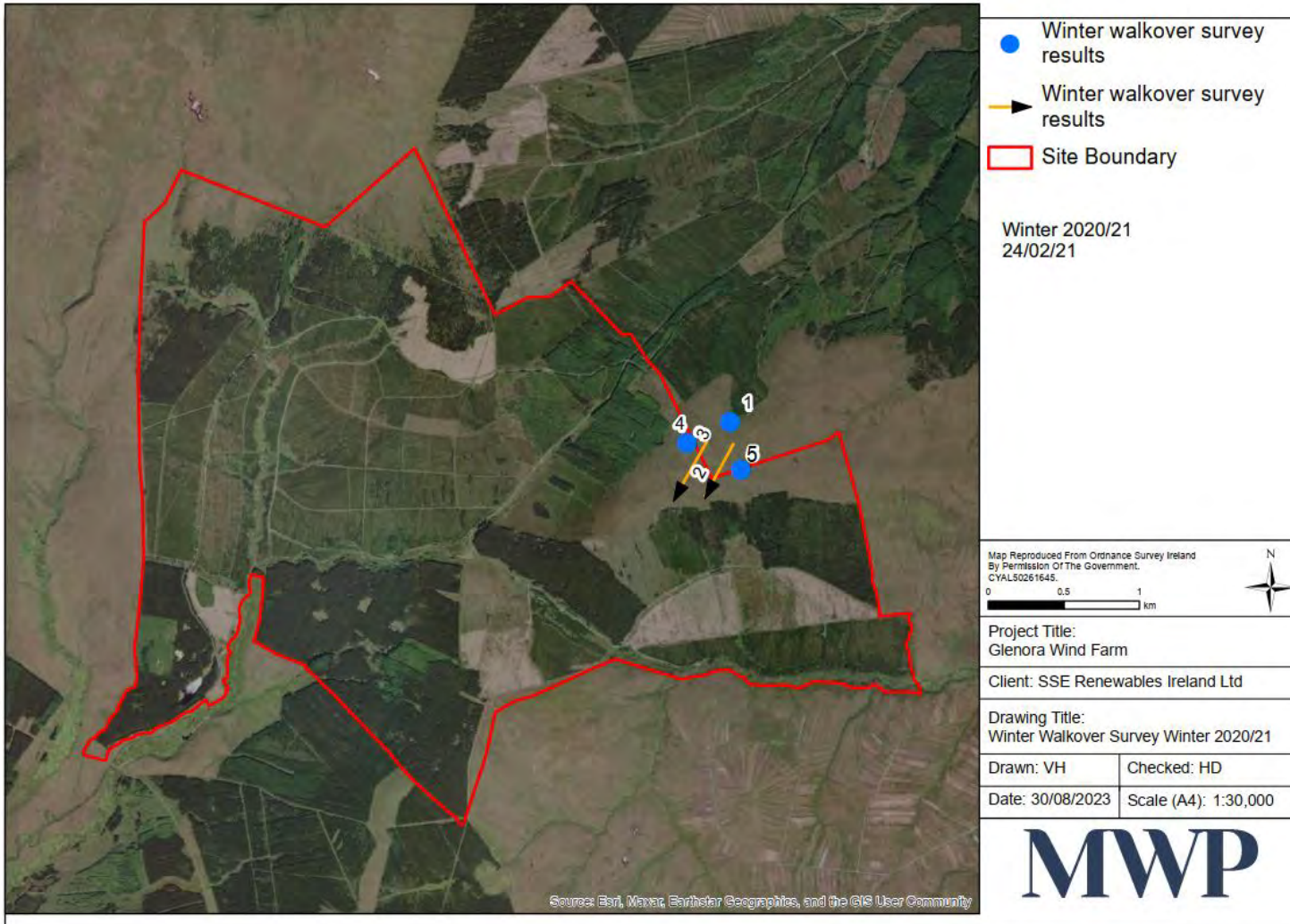
Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	14.02.21	PC	09:00	12:00	Mostly dry with showers and fog. SW winds f3-f4. Moderate visibility with showers. Temperature 9°	Moderate
B	24.02.21	PC	12:30	14:00	Dry, sunny and cloudy. SW wind f5-f7. Good visibility with no rain. Temperature 11°.	Good

Survey Results

Date	Observer	Start Time	Finish Time	Target Species Results
14.02.21 See Map 1 below	PC	09:00	12:00	<ol style="list-style-type: none"> 1. A Golden Plover flew over. 2. At 09:55 2 snipe flew S at 1m height for 6 seconds. 3. At 09:58 a Snipe flew S at 2m height for 5 seconds. 4. Red Grouse droppings were observed and recorded 5. At 10:06 a Snipe flew SW at 1m height for 10 seconds. 6. Red Grouse droppings were observed and recorded 7. 1 snipe at 11:25 flew W at 10 m height for 8 seconds. 8. 3 snipe at 11:29 flew S at 5 m height for 12 seconds.
24.02.21 See Map 2 below	PC	12:30	14:00	<ol style="list-style-type: none"> 1. Red grouse droppings 2. At 12:55 4x Golden Plover flew SSW at 2 m height for 5 seconds 3. 22x Golden Plover flew SW at 4 m height for 20 seconds. 4. Red Grouse droppings 5. Red grouse droppings



MAP 1



MAP 2



Winter 2021/22

Survey Summary

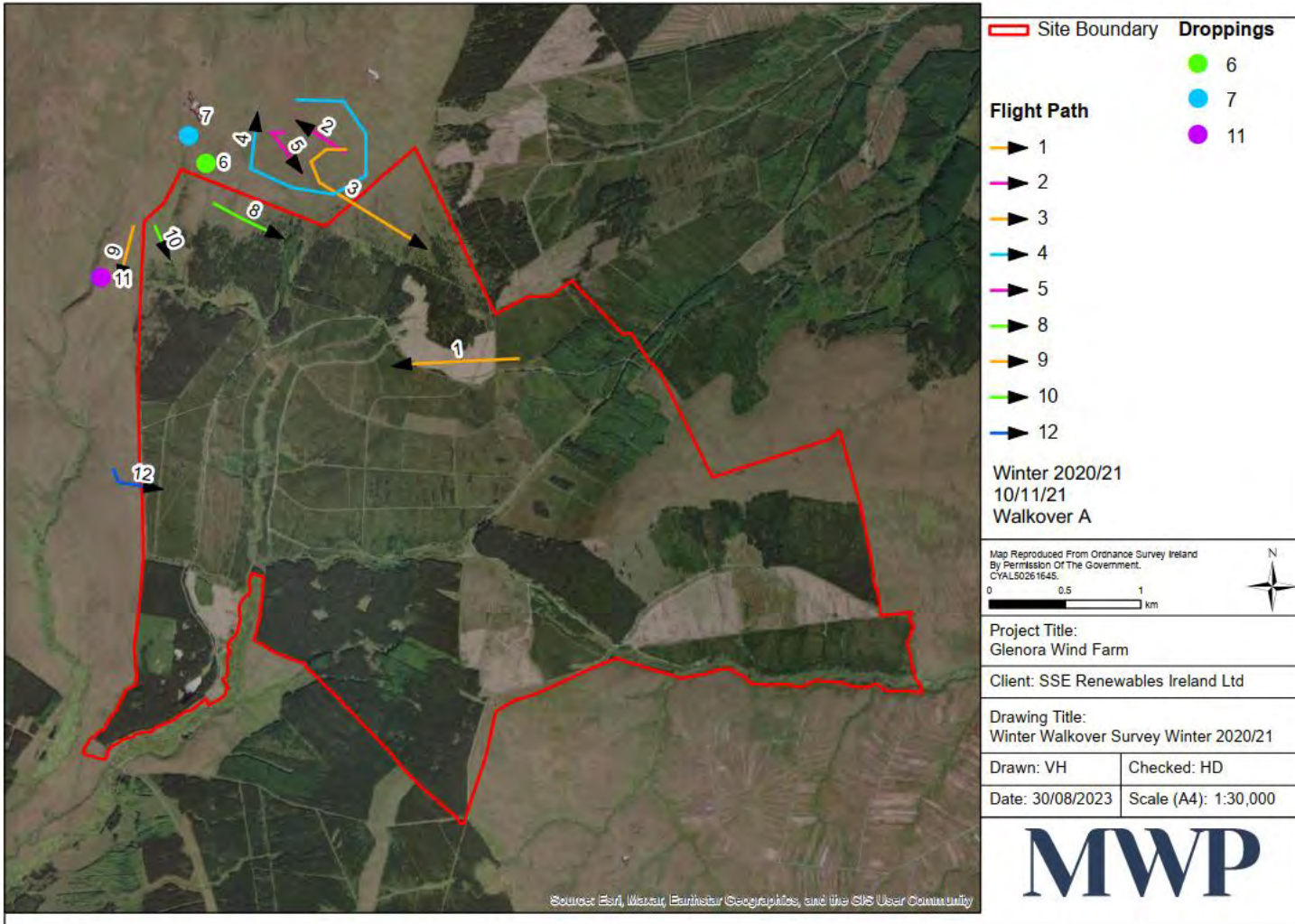
Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	10.11.21	SC & PC	09.40	12.45	A very cloudy but bright day with South to South/South-west winds F2-4. Temperature 9-10°C.	Good
B	10.11.21	SC & PC	13.05	15.25	Mostly cloudy but bright with some sunshine with South-west winds F2-3. Temperature 9-10°C.	Good
A	09.02.22	PC & SC	09.20	11.30	Rain 0.1 mm. Cloud cover 5/8. Westerly winds F6-7. Temperature 3°C.	Good
B	09.02.22	PC & SC	12.00	13.50	Rain 0.1 mm and sporadic hail stone. Cloud cover 8/8. Westerly winds F6-7. Temperature 7°C.	Good
A	14.03.22	SC	12.30	14.50	A warm, sunny afternoon with strong winds. Cloud cover 5/8. West south-westerly winds F4-5. Temperature 9°C.	Good
B	14.03.22	SC	16.00	17.50	A sunny evening with strong winds. Cloud cover 4/8. West south-westerly winds F4-5. Temperature 8°C.	Good

Survey Results

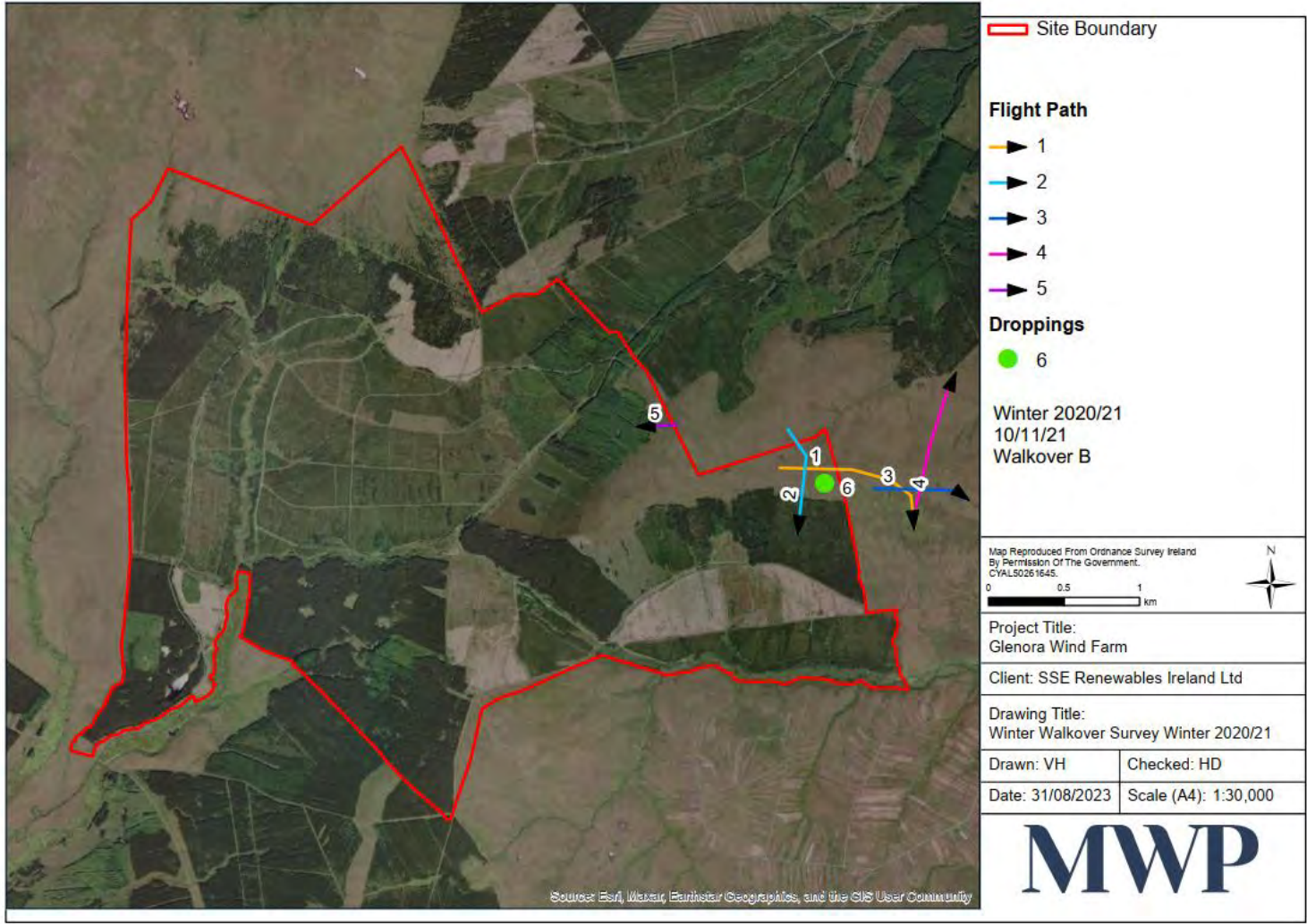
Date	Observer	Start Time	Finish Time	Target Species Results
10.11.21	SC & PC	09.40	12.45	<p>Walkover A</p> <ol style="list-style-type: none"> At 09.51, one great northern diver was observed flying north of VP3. It was flying in a westerly direction over 1st and 2nd rotation forest and clear fell at a height of 100 m for 40 seconds. At 10.29, one snipe was flushed northwest of VP6. It flew west to northwest at a height of 0-10 m for 10 seconds. At 10.29, four golden plover were flushed with the snipe north west of VP6. They flew west to southwest before turning and flying east to southeast at a height of 0-20 m for 20 seconds, 20-50 m for 20 seconds, and 50-100 m for 20 seconds. At 10.43, a flock of seven golden plover were circling overhead northwest of VP6. They circled over bog at heights of 0-20 m for 20 seconds, 20-50 m for 40 seconds and 50-100 m for 100 seconds. At 10.59, a second snipe was observed northwest of VP6. It was flushed and flew north to southeast over bog and 1st rotation forest at a height of 0-20 m for 5 seconds, 20-50 m for 38 seconds and 50-80 m for 52 seconds. Fresh red grouse droppings were observed on the ground.

Date	Observer	Start Time	Finish Time	Target Species Results
				<p>7. Red grouse dropping was recorded.</p> <p>8. At 11.06 a third snipe was observed southwest of VP6. It was flushed and was observed flying over bog east to southeast at a height of 0-20 m for 7 seconds, 20-50 m for 7 seconds, 50-100 m for 18 seconds and 100-120 m for 63 seconds.</p> <p>9. At 11.20 a fourth snipe was observed south of VP6. It was flushed and flying south at a height of 0-20 m for 8 seconds.</p> <p>10. At 11.22 a pair of red grouse were flushed southwest of VP6. They flew south over bog at 0-1 m height and were observed for 12 seconds.</p> <p>11. Red grouse droppings</p> <p>12. At 12.14, a fifth snipe was observed flushed southwest of VP6. It was flying south into 2nd rotation forestry and bog at a height of 0-15 m for 14 seconds.</p>
10.11.21	SC & PC	13.05	15.25	<p>Walkover B</p> <p>1 At 13.43, a flock of 38 golden plover was observed southeast of VP7. They were coming up off the ground and flying east, then south, over bog at a height of 0-20 m for 5 seconds, 20-50 m for 5 seconds, 50-100 m for 5 seconds and 100-120 m for 154 seconds.</p> <p>2 At 13.53, a snipe was flushed southeast of VP7. It flew south over bog and 1st rotation forestry at a height of 0-20 m for 7 seconds, 20-50 m for 26 seconds, and 50-100 m for 32 seconds.</p> <p>3 At 14.13, a pair of red grouse were flushed southeast of VP7. They were observed flying east over bog at 0-1 m for 34 seconds.</p> <p>4 At 14.30, two more golden plover were observed southeast of VP7. They were flying northeast over bog at a height of 85-90 m for 46 seconds.</p> <p>5 At 15.04 a second snipe was flushed east of VP7. It was flying west over bog at a height of 0-1 m for 10 seconds.</p> <p>6 At 14.03, red grouse droppings were observed on the ground.</p>
09.02.22	SC & PC	09.20	11.30	<p>Walkover A</p> <p>1 At 10.35 a male red grouse flew west at a height of 0.5 m for 54 seconds.</p> <p>2 At 10.45 a snipe flew southeast at a height of 1 m for 16 seconds.</p> <p>3 At 10.51 a snipe flew east at a height of 0.5 - 1 m for 10 seconds.</p> <p>4 At 11.11 a snipe flew southeast at a height of 0 - 3 m for 3 seconds.</p> <p>5 At 11.18 a snipe flew southeast at a height of 0 - 20 m for 30 seconds.</p>
09.02.22	SC & PC	12.00	13.50	<p>Walkover B</p> <p>1 At 12.45 red grouse droppings observed.</p> <p>2 At 13.14 a red grouse was flushed and flew north at a height of 1 m for 28 seconds.</p>
14.03.22	SC	12.30	14.50	Walkover A

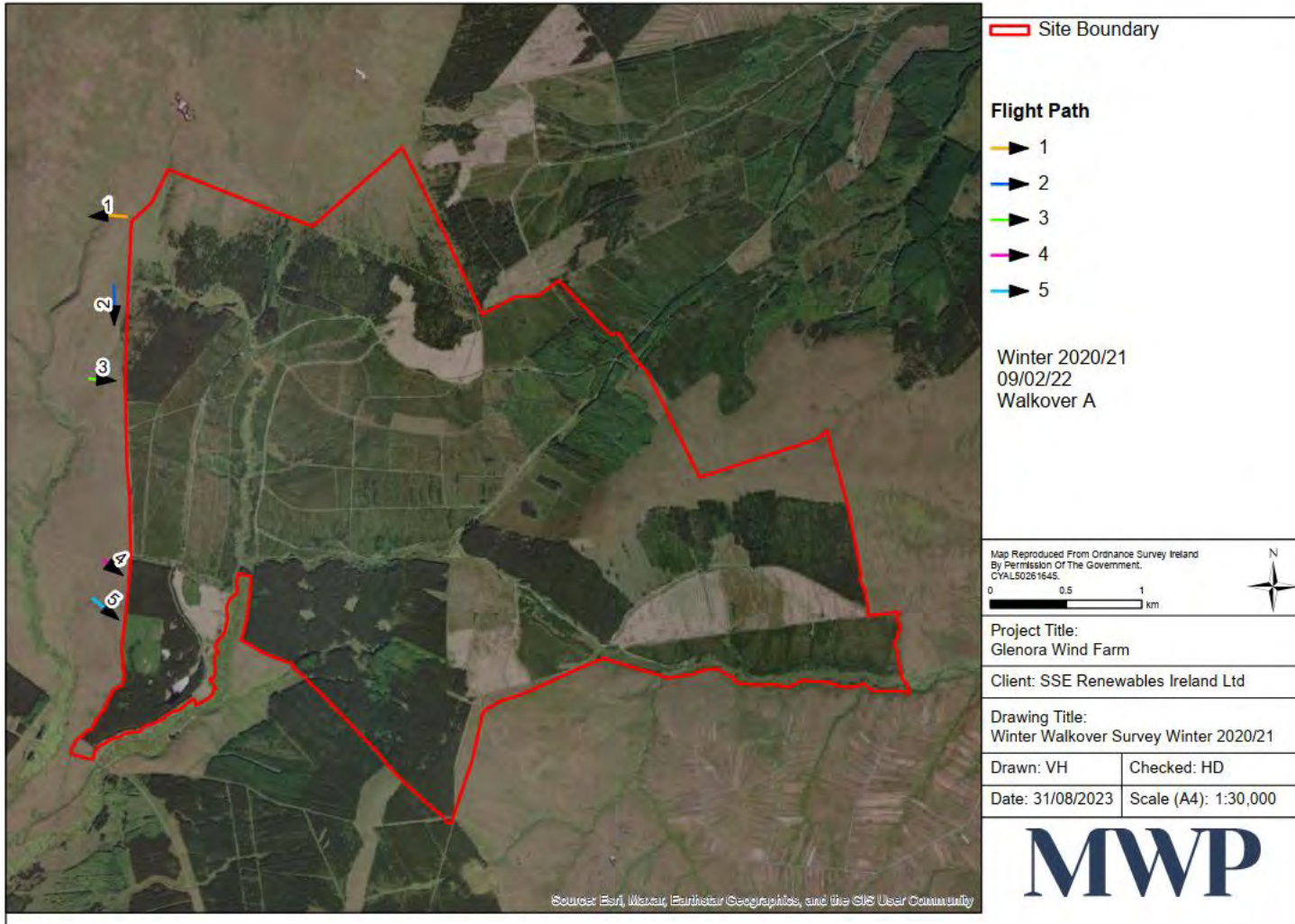
Date	Observer	Start Time	Finish Time	Target Species Results
See Map 7 below				<ol style="list-style-type: none"> 1. At 13.30 an adult snipe was flushed and flew north over bog at 0 – 20 m for 15 seconds before dropping back into bog and being lost from sight. 2. At 14.15 an adult snipe was flushed and flew south over bog at a height of 0 - 1 m for 11 seconds. 3. At 14.45 an adult snipe was flushed and flew southeast over bog, 1st and 2nd rotation forestry. It flew at a height of 0 - 20 m for 19 seconds and at 20 – 40 m for 37 seconds before dropping into forestry and out of sight.
14.03.22	SC	16.00	17.50	<p>Walkover B</p> <ol style="list-style-type: none"> 1 At 16.15 a pair of red grouse were observed flying southeast at 0 – 1 m height for 18 seconds. 2 At 16.15 a female red grouse was observed flying southwest at 0 – 1 m height for 8 seconds. 3 At 16.17 11 golden plover were initially heard and subsequently observed to the east. They were flying south at 15 – 1 m height for 11 seconds. 4 At 16.29 an adult snipe was flushed and flew north over bog at < 1 m height for 9 seconds. 5 The 11 golden plover were observed again on the ground 500 m from the observer. They remained on the ground for 10 seconds before flying west over bog at 0 – 20 m height for 60 seconds, 20 – 50 m for 60 seconds and 50 – 100 m for 60 seconds. They then turned and flew back to land on the ground in the same spot they were previously in. They remained on the ground for a further 2990 seconds. 6 At 17.08 an adult snipe was observed. It was flushing and flying west over bog at 0 – 50 m height for 10 seconds. 7 At 17.10 second pair of red grouse were observed flushing and flying east over bog at 0 – 1 m height for 23 seconds. 8 At 17.20 a third pair of red grouse were flushed and flew west over bog at 0 – 1 m height for 8 seconds.
See Map 8 below				



MAP 3

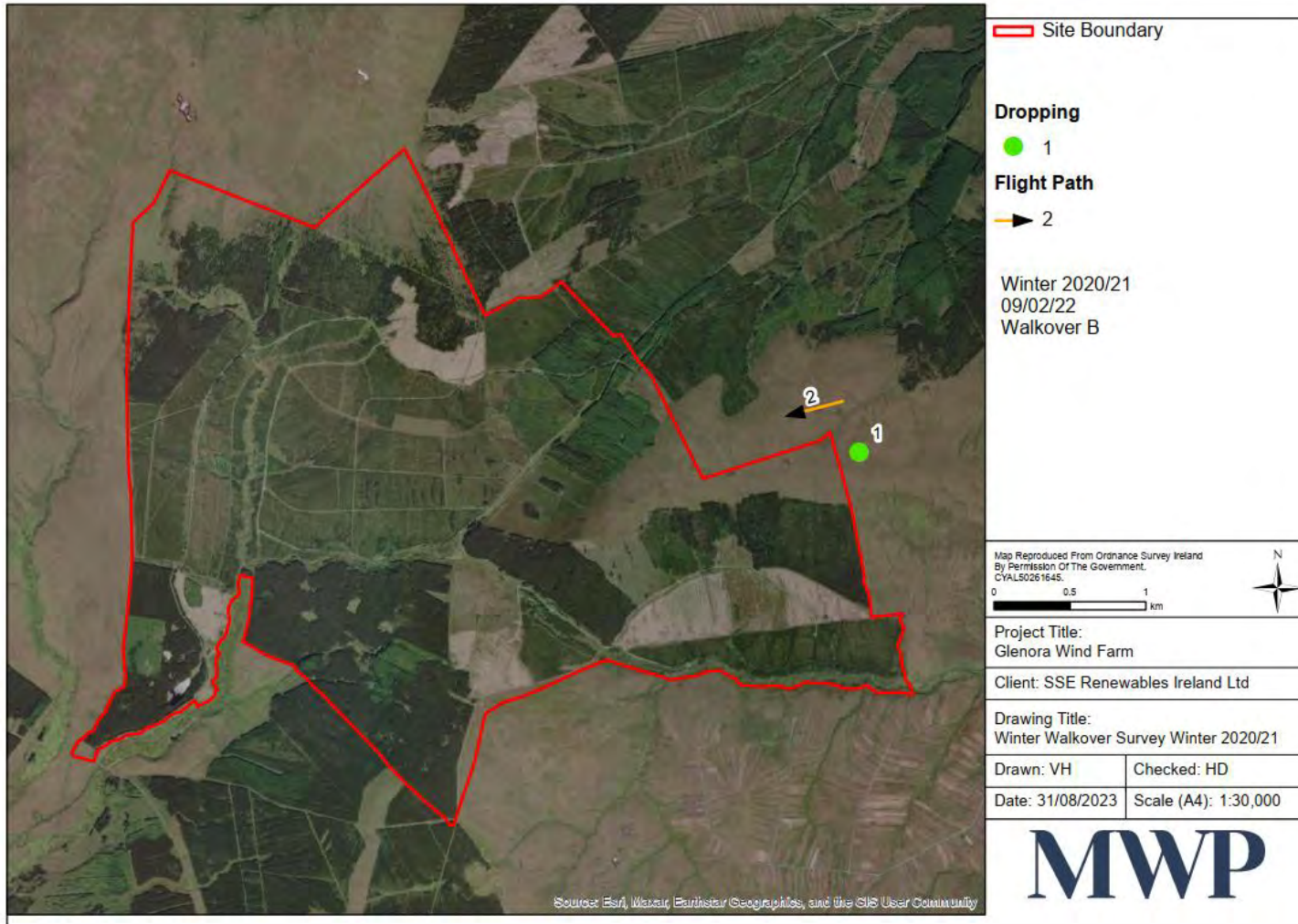


MAP 4

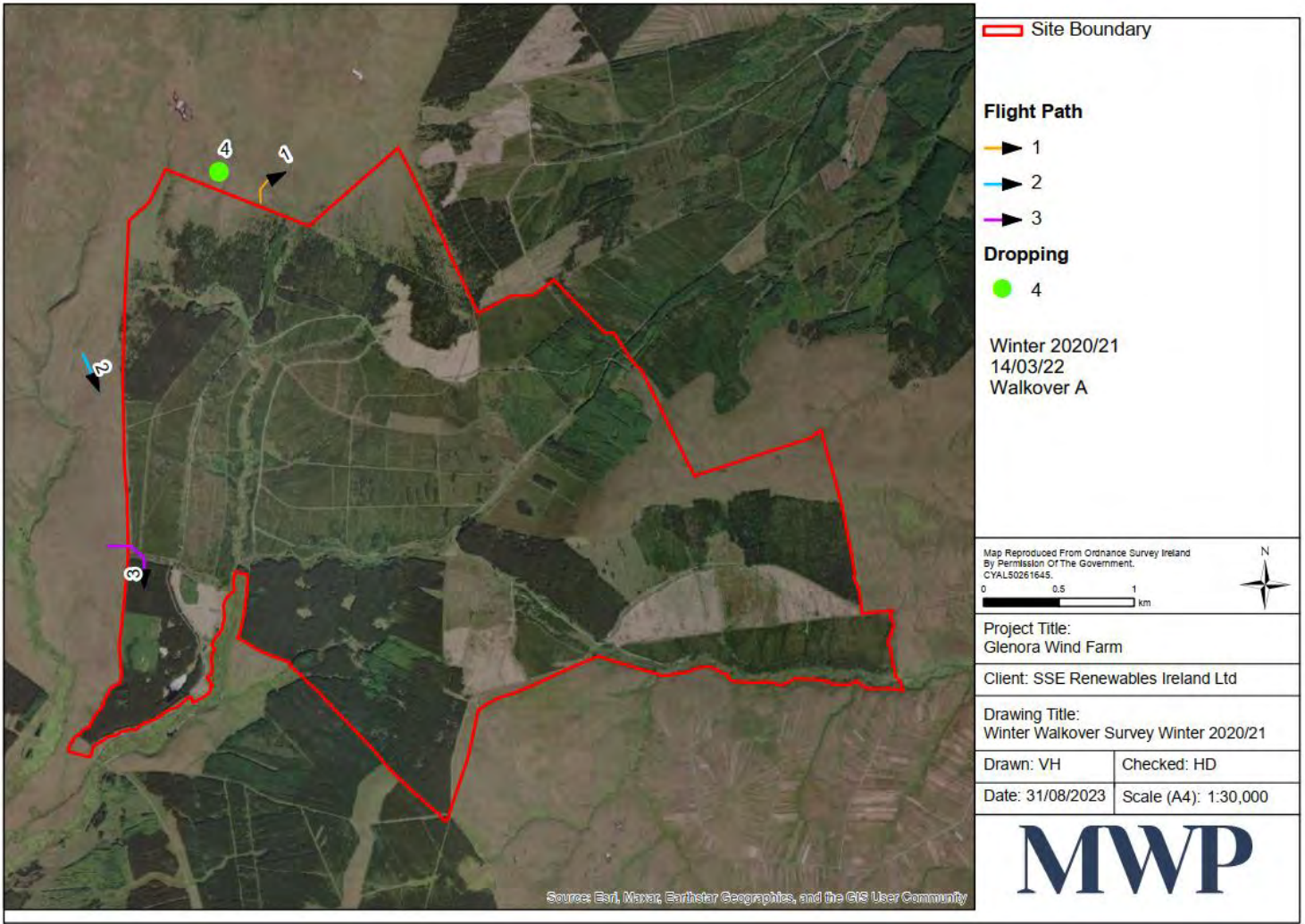


MAP 5

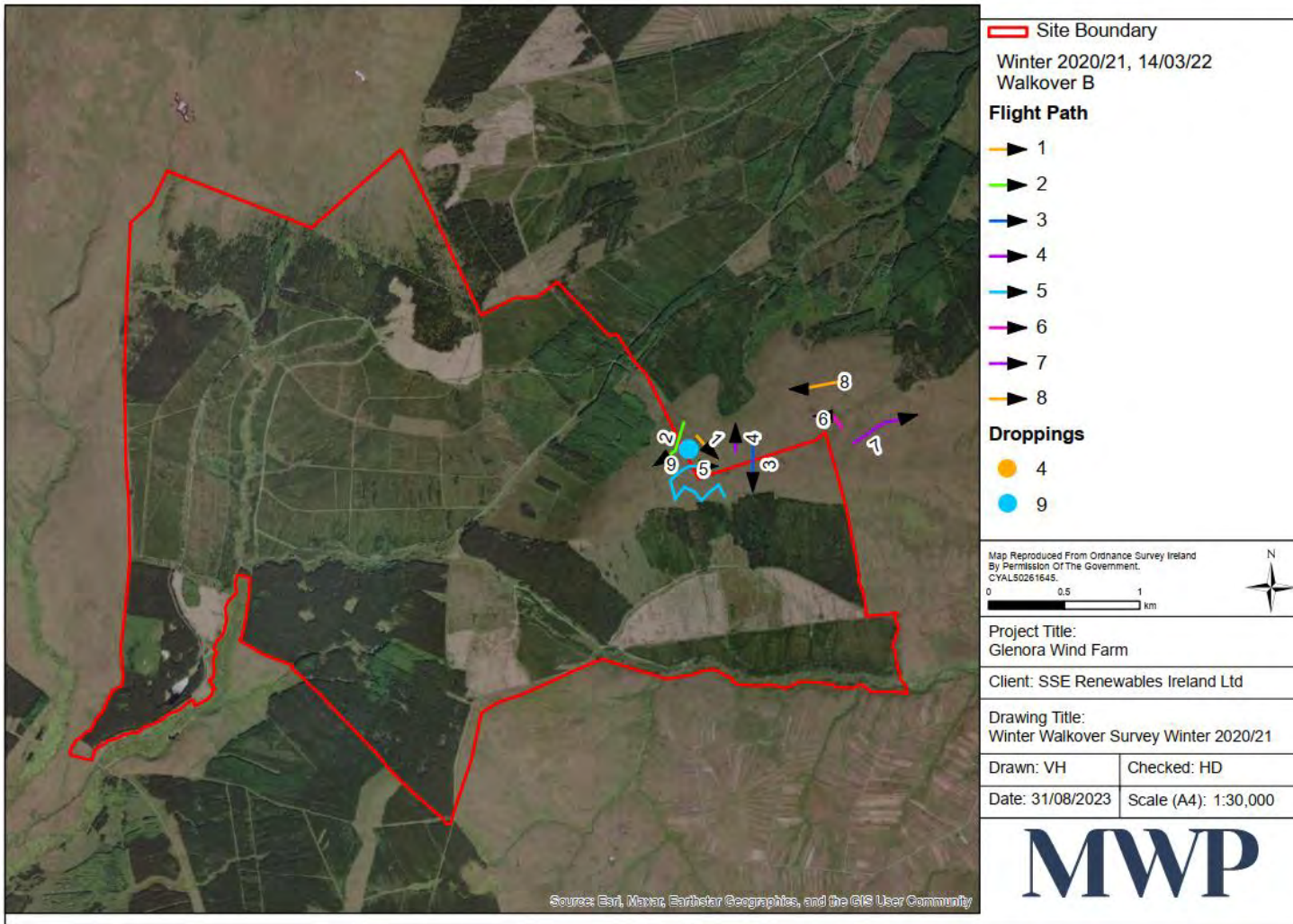




MAP 6



MAP 7



MAP 8

Winter 2022/23

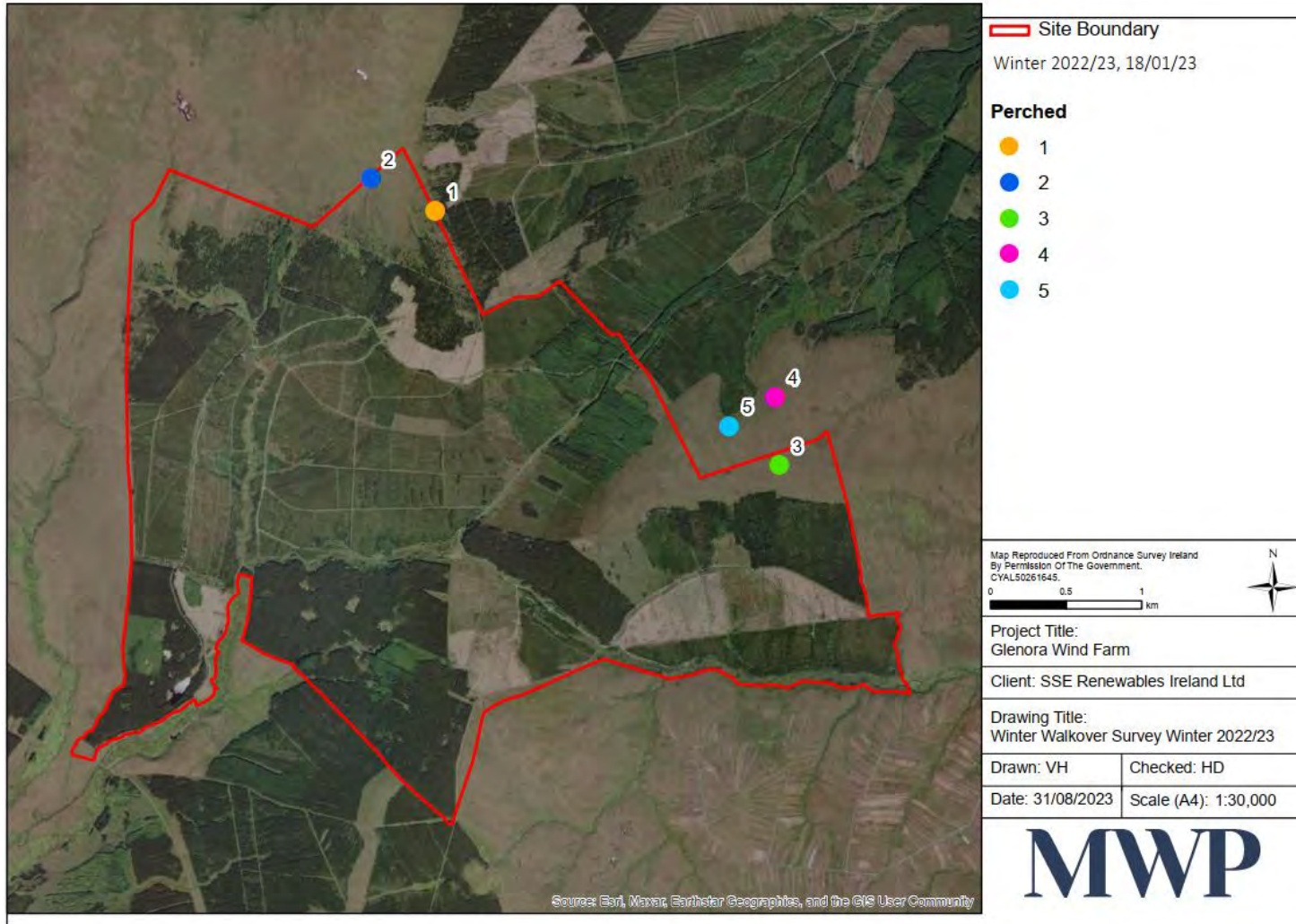
Survey Summary

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	18.01.23	SC	10:20	12:10	A cold wintery day with some scattered showers and snow on ground. NNW strong breeze, light showers with good visibility, cloudy. Temperature 4°	Good
B	18.01.23	SC	12:20	13:45	A wintery but sunny day with snow on ground. NW fresh breeze, good visibility with no rain. Temperature 3°	Good
A	17.02.23	PC	14:20	16:35	S gentle breeze, good visibility with no rain. Temperature 10°.	Good
B	17.02.23	PC	16:40	18:00	S gentle breeze, good visibility with drizzle. Temperature 8°	Good
A	24.03.23	SC	12:00	14:15	A windy day with mixture of sunny spells and heavy showers. W fresh breeze, good visibility with heavy showers. Temperature 9°	Good
B	24.03.23	SC	15:10	16:15	A cold day with very strong winds and occasional heavy rain shower. WNW fresh breeze, good visibility with heavy showers. Temperature 8°.	Good

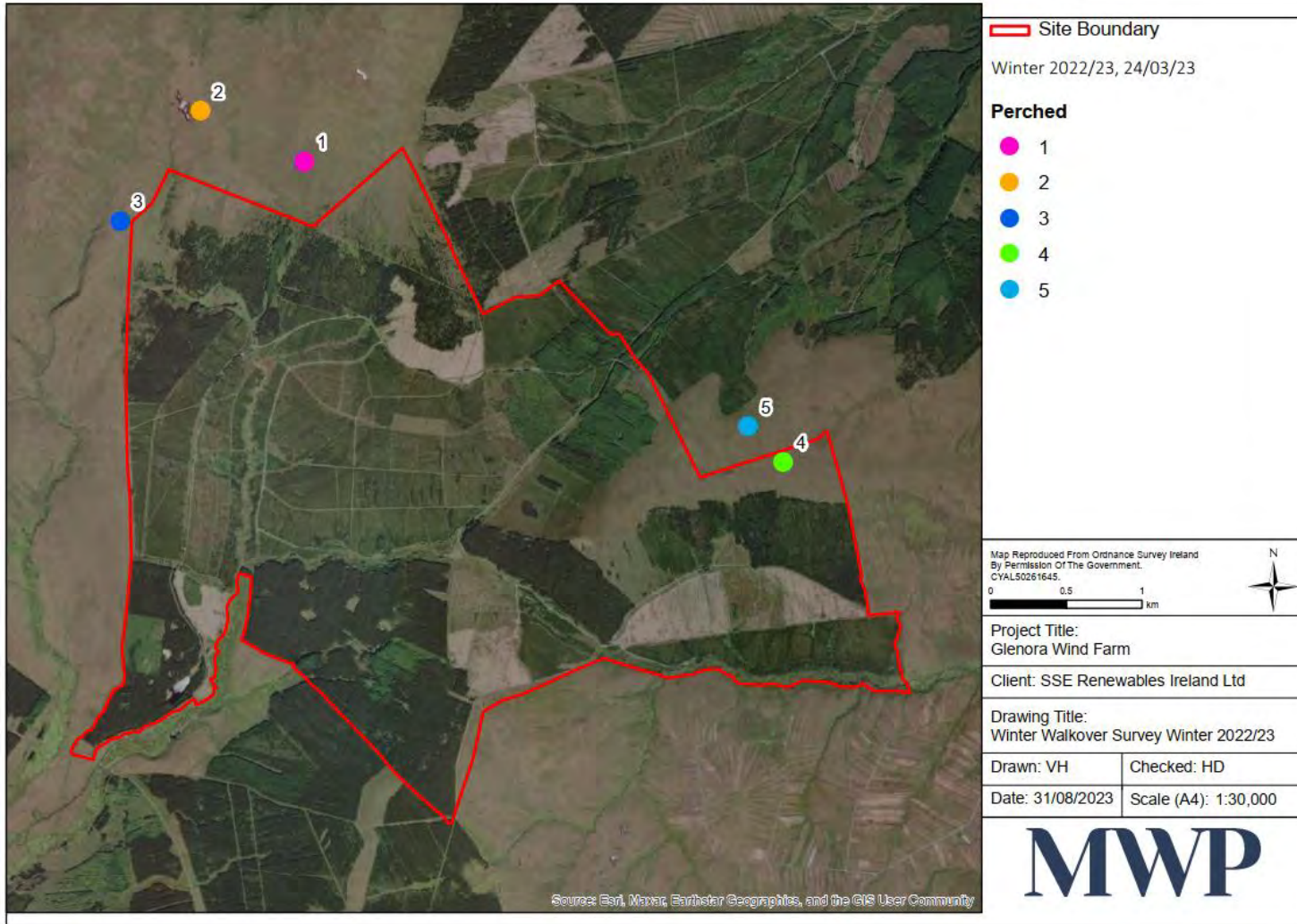
Survey Results

Date	Observer	Start Time	Finish Time	Target Species Results
18.01.23	SC	10:20	12:10	Walkover A 1. At 10.38, a large female sparrowhawk flushed from forestry and flew east. 2. At 11.12, an adult snipe flushed and flew southwest towards forestry.
See Map 9 below		12:20	13:15	Walkover B 1. At 12.49, an adult snipe flushed and flew northeast across bog. 2. At 13.07, the same snipe flushed and flew southwest. 3. At 13.12, a second snipe flushed and flew northwest high.
17.02.23	SC	14:20	16:35	Walkover A

Date	Observer	Start Time	Finish Time	Target Species Results
(no map)		16.40	18.00	<ol style="list-style-type: none"> Two golden plover observed for 27 seconds at 15 m height. At 15.31, two snipe observed for 17 seconds at 5 m height. At 15.27 red grouse observed for 14 seconds at 2 m height. Walkover B <ol style="list-style-type: none"> At 17.31, a snipe was observed.
24.03.23	SC	12.00	14.15	Walkover A <ol style="list-style-type: none"> At 12.48, an adult golden plover was flushed and flew north. At 13.04, golden plover on ground calling, possibly holding territory. At 13.16, a golden plover was on the ground alarm calling behaving as if holding territory.
See Map 10 below		15.10	16.15	Walkover B <ol style="list-style-type: none"> At 15.25, 4 adult golden plover were observed on ground by pools for the duration of the walkover. At 15.59, a jack snipe was flushed flying west and was observed dropping onto bog.



MAP 9



MAP 10



Appendix 10

**Breeding Season Survey Summaries
and Results**

Breeding Walkover Survey Summaries and Results

2019 Breeding Walkover Survey

Survey Summary & Results

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility	Results
A	16.07.19	SC	11:40	12:00	Mostly cloudy with persistent misty rain. Cloud 8/8 Wind SW F2-3	Good	No target species observed.

2019 Nocturnal breeding Survey

Survey Summary

Date	Observer	Start Time	Finish Time	Weather
20.06.19	SC&JC	23:15	00:30	Mostly cloudy 7/8, wind W f1-2, temp 8oC and visibility good
20.08.19	SC&AC	21:45	22:45	Calm dry night, cloud 4/8, wind SW f 1-2, temp 12oC and good visibility good

Survey results

Date	Observer	Target Species Results
20.06.19	SC&JC	No evidence of Woodcock
20.08.19	SC&AC	No evidence of Woodcock

2020 Breeding Walkover Survey

Survey Summary & Results

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility	Results
A	08.05.20	JNM	15:00	17:00	A dull dry day with low cloud cover. Wind direction S-SW, F2-5, temp 6-8°C. Visibility good.	Good	No target species recorded.

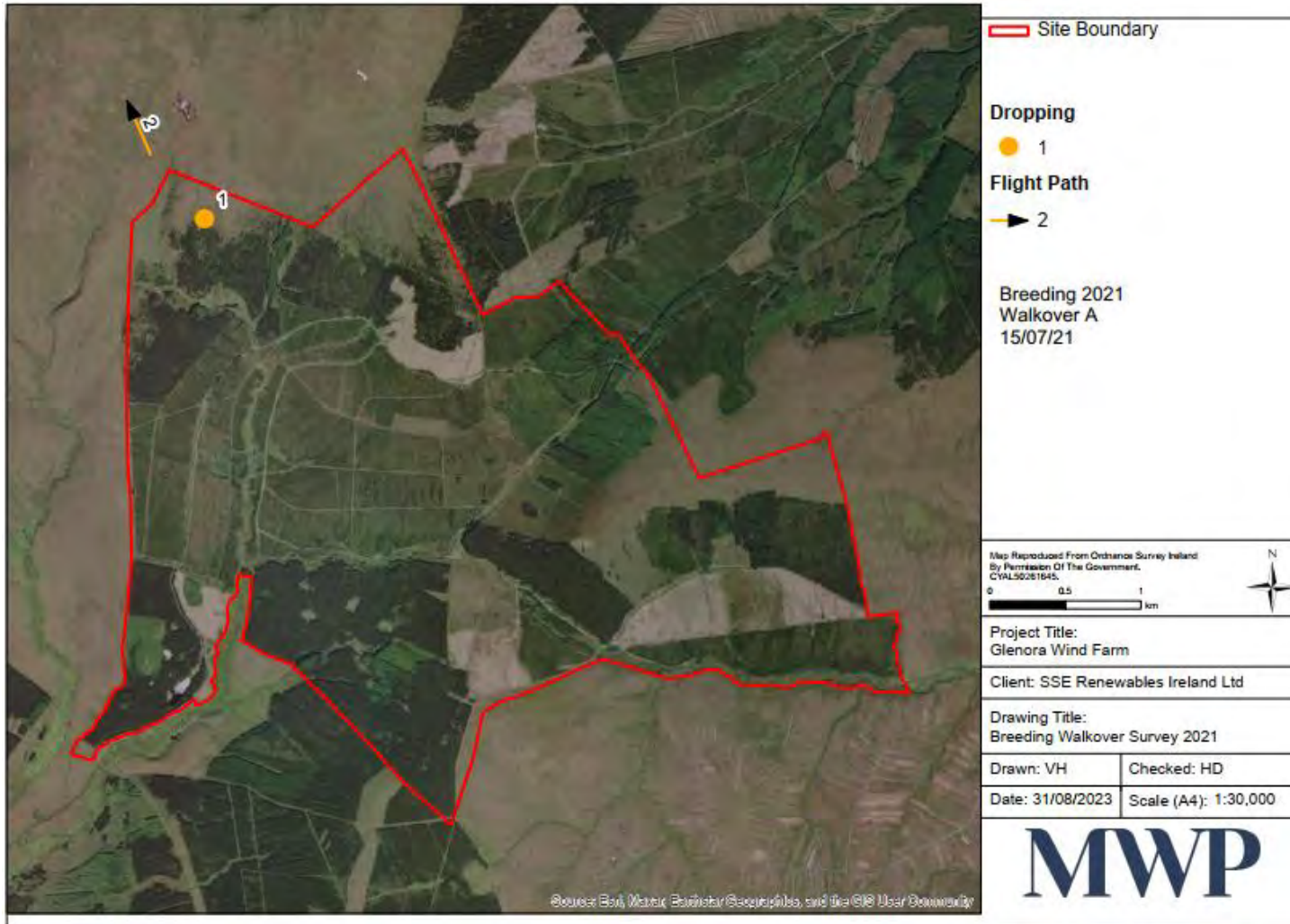
2021 Breeding Walkover Survey

Survey Summary

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	15.07.21	PC	07:15	10:15	Dry, foggy and misty with north-westerly winds, wind F1, temp 14oC	Poor
B	21.07.21	PC	10:15	13:00	Dry and sunny, wind direction southeast, wind F1, temp 27oC	Good
A	28.07.21	PC	08:45	11:30	Dull and overcast with consistent light rain, wind direction northwest, wind F2-3, temp 13oC	Poor
B	28.07.21	PC	12:00	14:45	Dry with 70% cloud cover, wind direction northwest, wind F2-3, temp 13oC,	Good

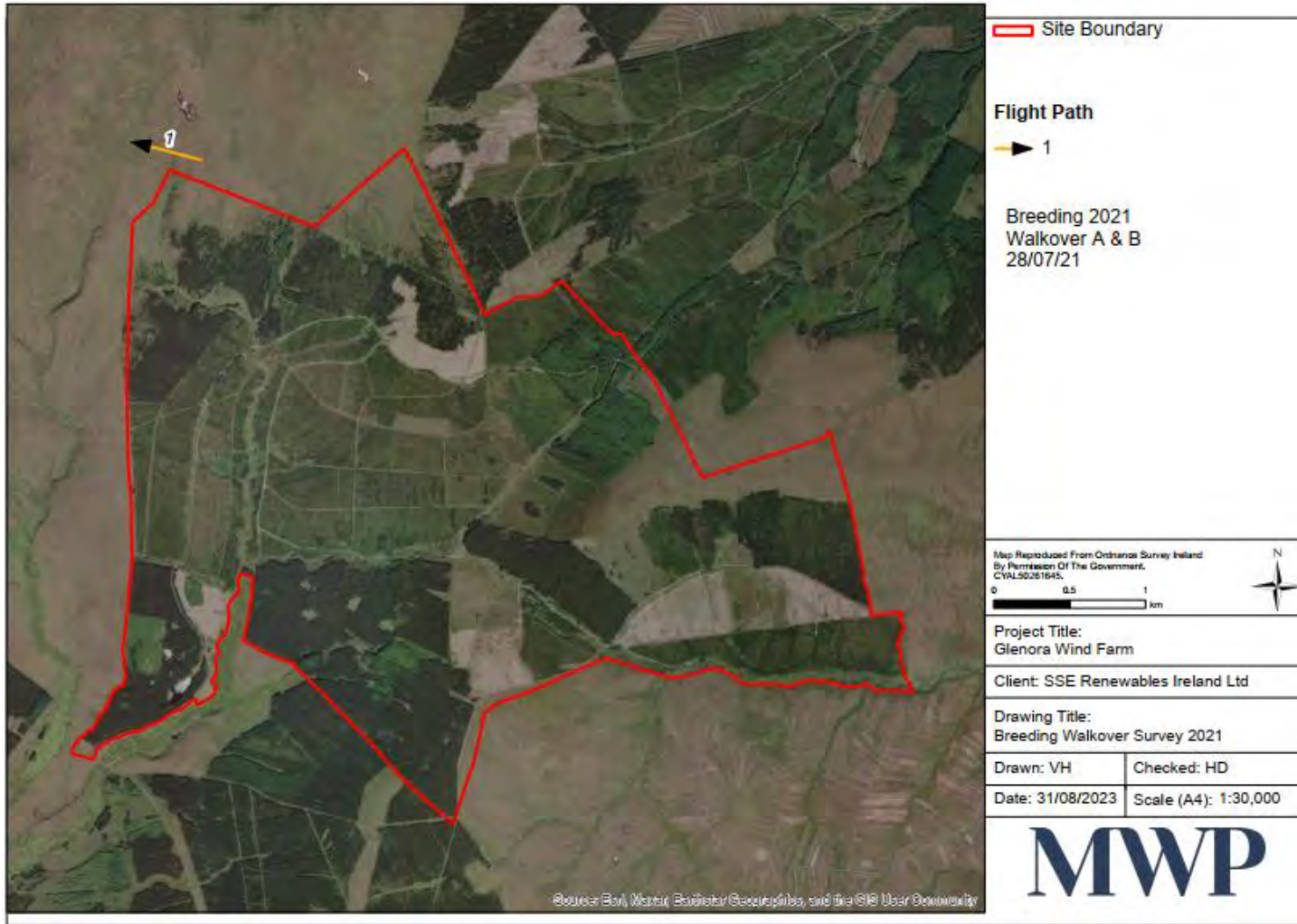
Survey Results

Date	Observer	Start Time	Finish Time	Target Species Results
15.07.21	PC	07:15	10:15	Walkover A. 1. Red grouse calling but was not seen (3.42611500 – 4913366) 2. Golden Plover calling and singing to the NW but were not seen. 2x Golden Plovers flew 100m height outside site boundary See Map 1 below
21.07.21	PC	10:15	13:00	Walkover B. No target species were observed
28.07.21	PC	08:45	11:30	Walkover A. 1. One snipe flushed See Map 2 below
28.07.21	PC	12:00	14:45	Walkover B. 1. Golden Plover heard flying over VP7, the bird was not seen as flying high in the sky.



Map 1





Map 2

2021 Nocturnal breeding Survey

Survey Summary

Date	Observer	Start Time	Finish Time	Weather
18.06.21	PC	23:00	00:00	Dry and calm, wind direction north, wind F1-2, temp 8oC. Good visibility.

Survey Results

Date	Observer	Target Species Results
18.06.21	PC	No evidence of woodcock

2022 Breeding Walkover Survey

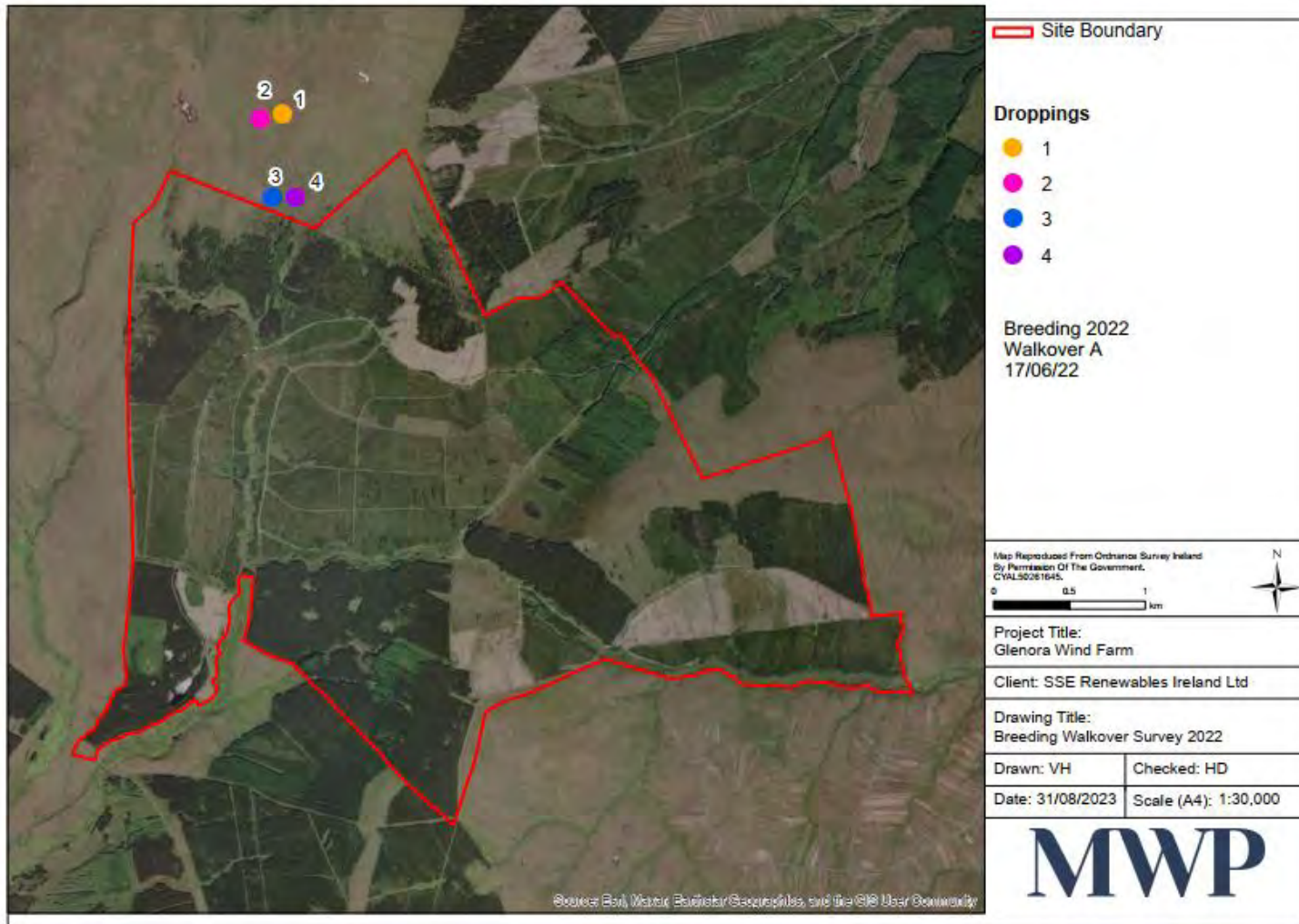
Survey Summary

Walkover	Date	Observer	Start Time	Finish Time	Weather	Visibility
A	17.06.22	SC & PC	11.30	14.00	Mostly overcast with occasional sunshine with west winds F4. Cloud cover 8/8 to 7/8. Temperature 15°C.	Good
B	17.06.22	SC & PC	14.20	16.00	Mostly overcast with occasional sunshine with west winds F4. Cloud cover 8/8 to 7/8. Temperature 15°C.	Good
A & B	24.08.22	PC & SC	10.00	15.00	Dry with some showery spells. Rain 0.1 mm. Cloud cover 7/8. South-westerly winds F2-3. Temperature 16°C.	Good

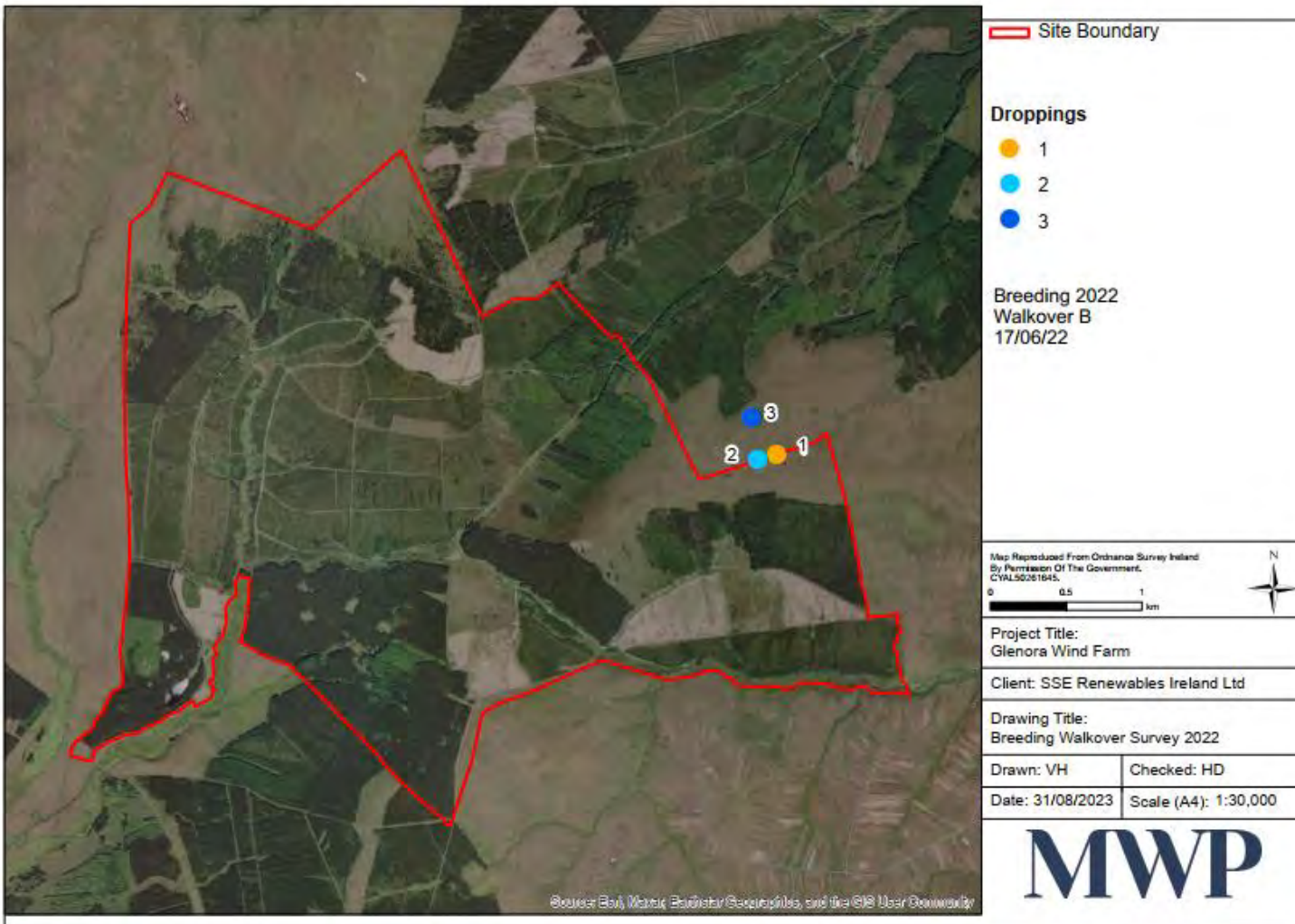
Survey Results

Date	Observer	Start Time	Finish Time	Target Species Results
17.06.22 See Map 3 below	SC & PC	11.30	14.00	<p>Walkover A.</p> <p>One breeding pair of golden plover and three non/failed breeders observed.</p> <ol style="list-style-type: none"> At 12.15 a kestrel to north hunting At 12.20, an adult golden plover was alarm calling and was subsequently observed flying north east over a ridge. It sounded like a second bird was calling with it. At 12.33, a pair of breeding golden plover were observed. They were circling and alarm calling. At 12.45, three more adult golden plover came down from the top of the mountain to the north. They landed close to the breeding pair.
17.06.22 See Map 4 below	SC & PC	14.20	16.00	<p>Walkover B.</p> <ol style="list-style-type: none"> At 14.50, a kestrel was observed hunting over bog. At 14.55, an adult male red grouse was flushed and flew north. At 15.31, the same adult male red grouse was flushed again and flew south.
24.08.22 See Map 5	SC & PC	10.00	15.00	<p>Walkover A.</p> <ol style="list-style-type: none"> At 11.39 an adult golden plover was flushed from the ground and flew north at 1 m for 8 seconds. Co-ordinates 54.2626328, -9.49757741.

Date	Observer	Start Time	Finish Time	Target Species Results
below				
24.08.22				
See Map 5 below	SC & PC	10.00	15.00	Walkover B. 1 Red grouse droppings observed. Co-ordinates 54.2469922, -9.44085241.



Map 3



Map 4

2022 Nocturnal Breeding Survey

Survey Summary

Date	Observer	Start Time	Finish Time	Weather
22.06.22	SC	22.00	23.15	Overcast. West wind F 2-4. Temperature 12-11°C. Visibility good.

Survey Results

Date	Observer	Target Species Results
22.06.22	SC	No evidence of woodcock An adult male snipe heard displaying south of T3 on Transect B
No map		An adult snipe flushed from the track and flew south at 23.05

Appendix 11

**Hinterland Survey Summaries and
Results**

Hinterland Survey Results

BREEDING 2019

Survey Summary

Survey	Date	Observer	Start Time	Finish Time	Weather
Cutover bog Survey	18.07.19	SC	09:00	12:00	Overcast, very heavy prolonged showers at times, cloud 8/8, wind F3-4

Survey Results

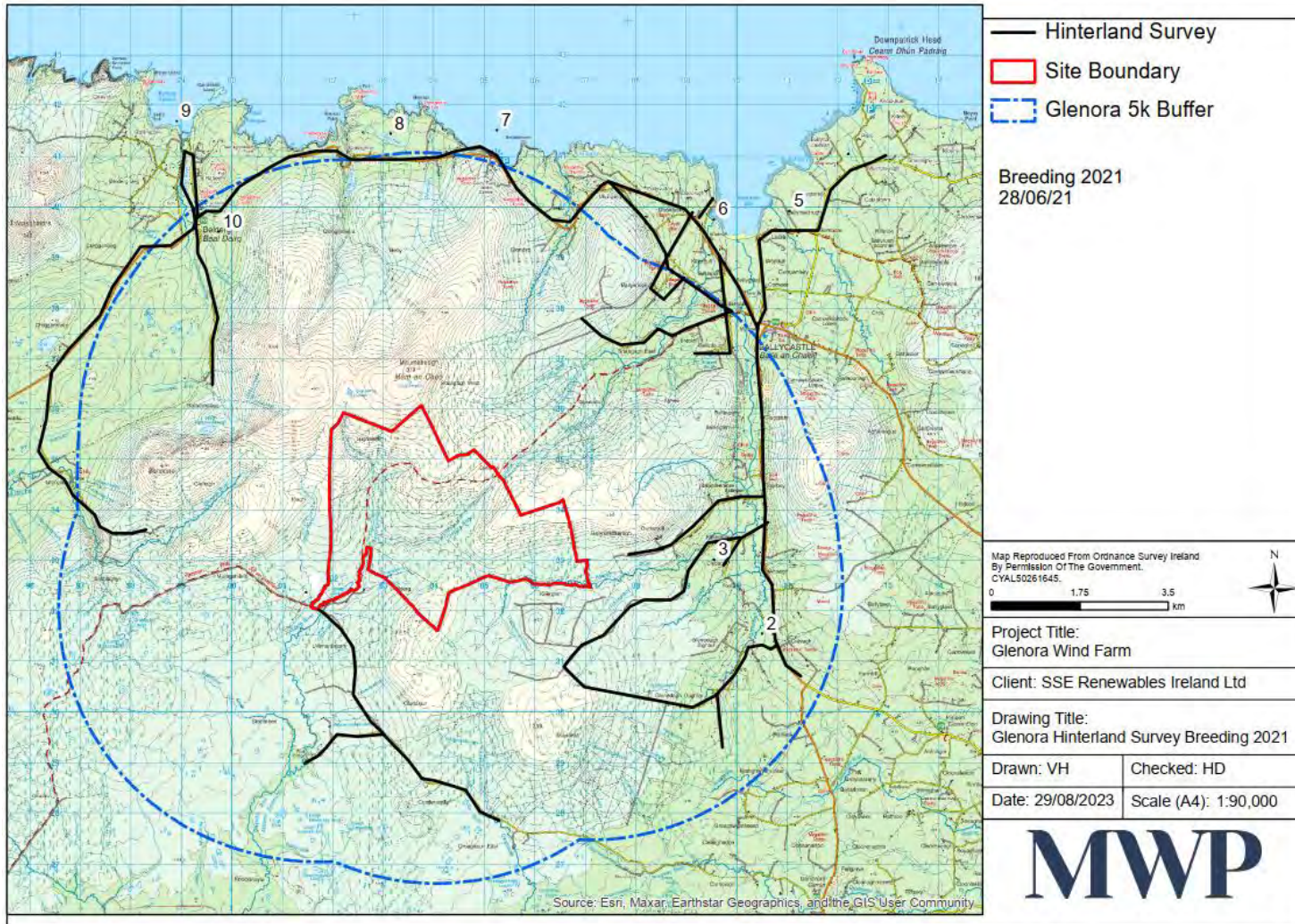
- No target species were observed during this survey.

BREEDING 2021**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Driven Transect	28.06.21	PC	09:00	15:30	Dry and dull but sunny after lunch with cloud cover 8/8, wind direction north, wind F1-2, temp 11oC

Survey Results

Survey	Date	Observation No.	Target Species Results
Driven Transect See Map 1 below	28.06.21	2	2 adult lesser black-backed gulls in a field
		3	2 adult lesser black-backed gulls flying northwest
		5	13 black-headed gulls 1 ringed plover
		6	4 black-headed gulls 4 herring gulls 2 sandwich tern 2 lesser black-backed gulls 3 shags
		7	12 herring gulls 2 fulmar
		8	1 herring gull
		9	1 herring gull 3 great black-backed gulls
		10	1 herring gull



MAP 1



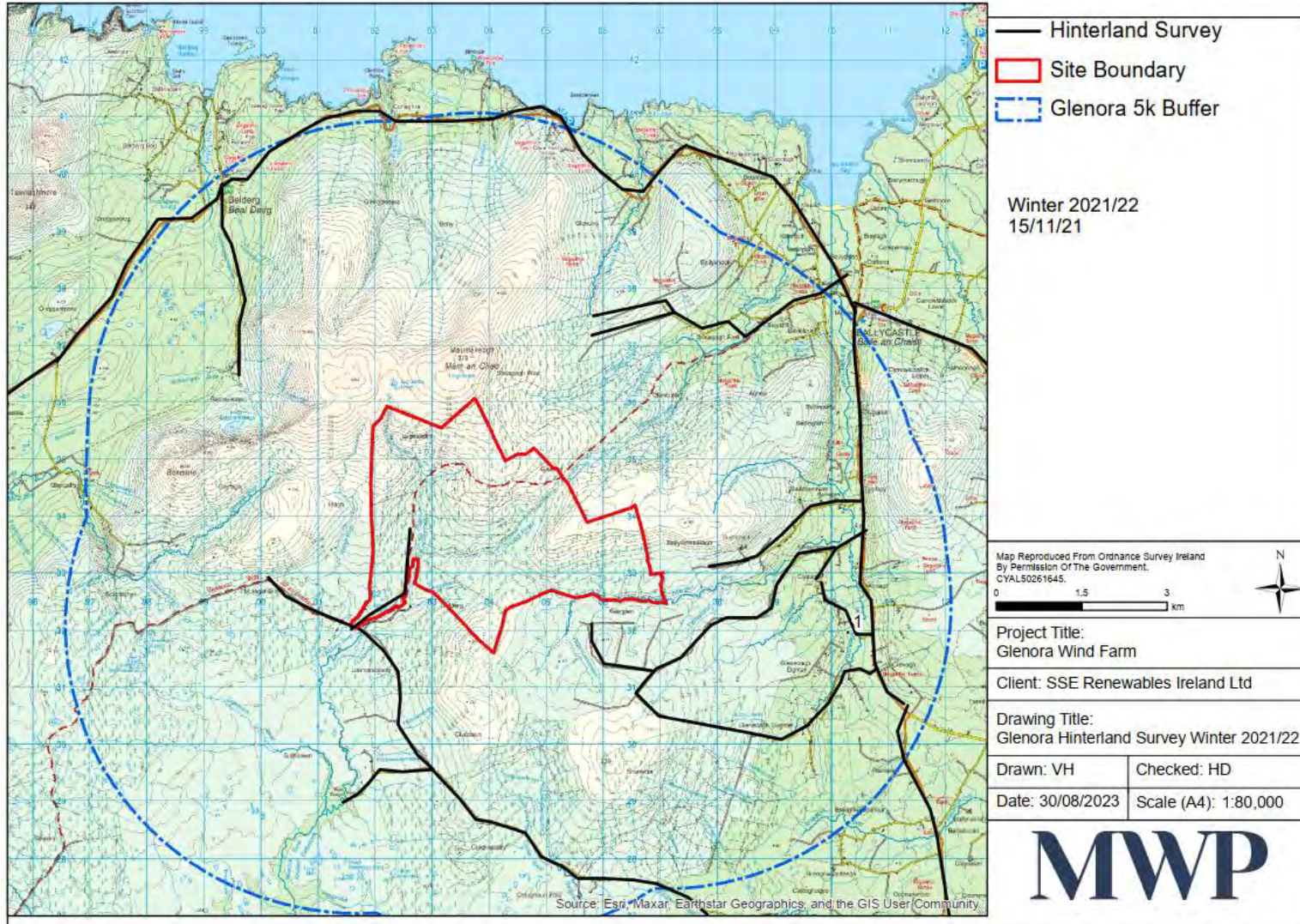
WINTER 2021/22**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Driven Transect	15.11.21	SC	11:50	17:00	A mostly cloudy but bright day with west-south-west winds F1-4. Temperature 10-9°C.
Driven Transect	14.01.22	SC	08:45	14:45	An overcast day. South south-easterly winds F2-3. Temperature 6°C.
Driven Transect	08.03.22	SC	09:00	17:00	An overcast morning with very strong winds and continuous light rain. Cloud cover 8/8 to 5/8. Southeast to west winds F6-10. Temperature 5-7°C.

Survey Results

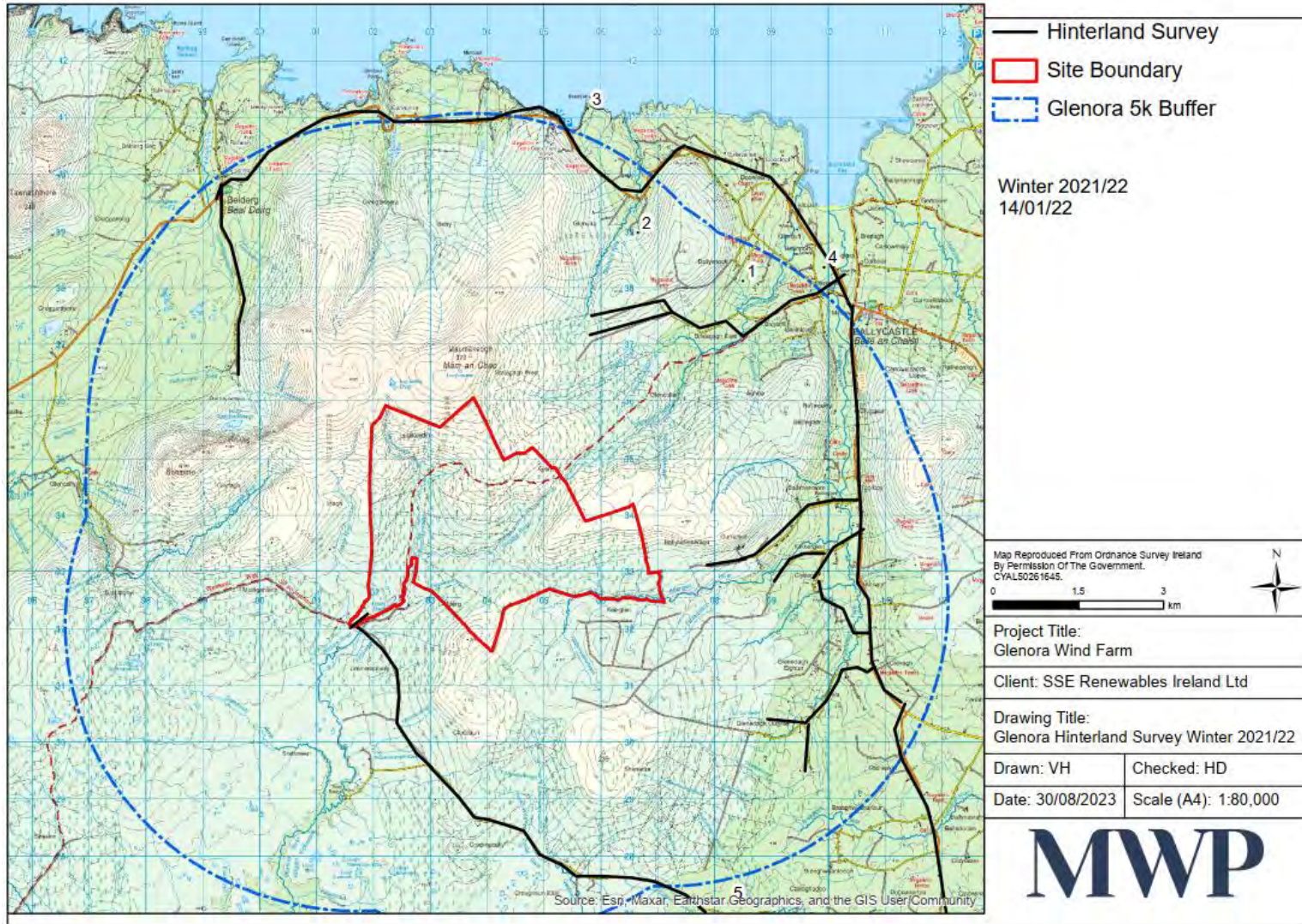
Survey	Date	Observation No.	Target species Results
Driven Transect See Map 2 below	15.11.21	1	Adult male kestrel observed flying over a field. It perched on a post and was mobbed by a jackdaw.
Driven Transect See Map 3 below	14.01.22	1	3 rock dove.
		2	50 golden plover
		3	7 fulmar on a cliff edge.
		4	34 herring gull, 30 common gull feeding in fields.
		5	Male sparrowhawk flying into 1st rotation forestry.
	08.03.22	1	Adult black-headed gull was observed flying south.

Survey	Date	Observation No.	Target species Results
Driven Transect See Map 4 below		2	8 herring gulls (7 adult and 1 2nd calendar year bird) observed feeding in fields north of the road.
		3	1 adult herring gull observed flying south
		4	11 golden plover observed circling bog to the south of the road.
		5	Adult herring gull observed flying south low over fields.
		6	Adult herring gull observed flying south low through the valley.
		7	Adult common gull and four adult herring gulls feeding in fields.
		8	Adult herring gull observed north of Ceide Fields Visitor Centre.
		9	Adult snipe flushed from the bank of the Ballinglen River.
		10	14 golden plover observed on the ground.
		11	Buzzard observed above 1st rotation forestry flying south.
		12	Pair of great black-back gulls observed flying north to south.
		13	Adult male hen harrier observed flying west.
		14	Adult male hen harrier observed again flying east
		15	Presumably a second adult male hen harrier observed to the west flying east and low over bog.
		16	Adult woodcock flushed on the surveyor's way in to check Altderg Lough.



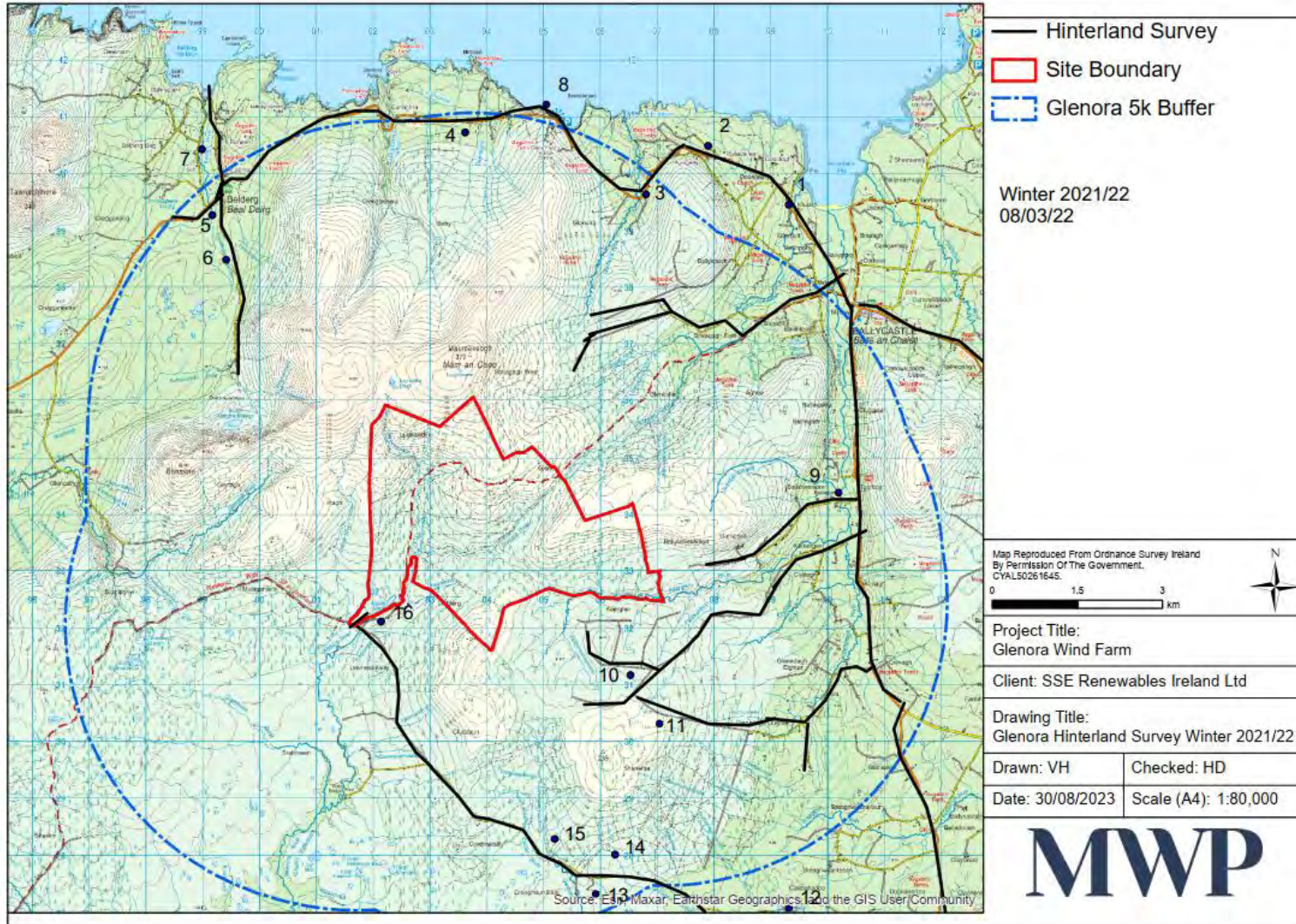
MAP 2





MAP 3





MAP 4

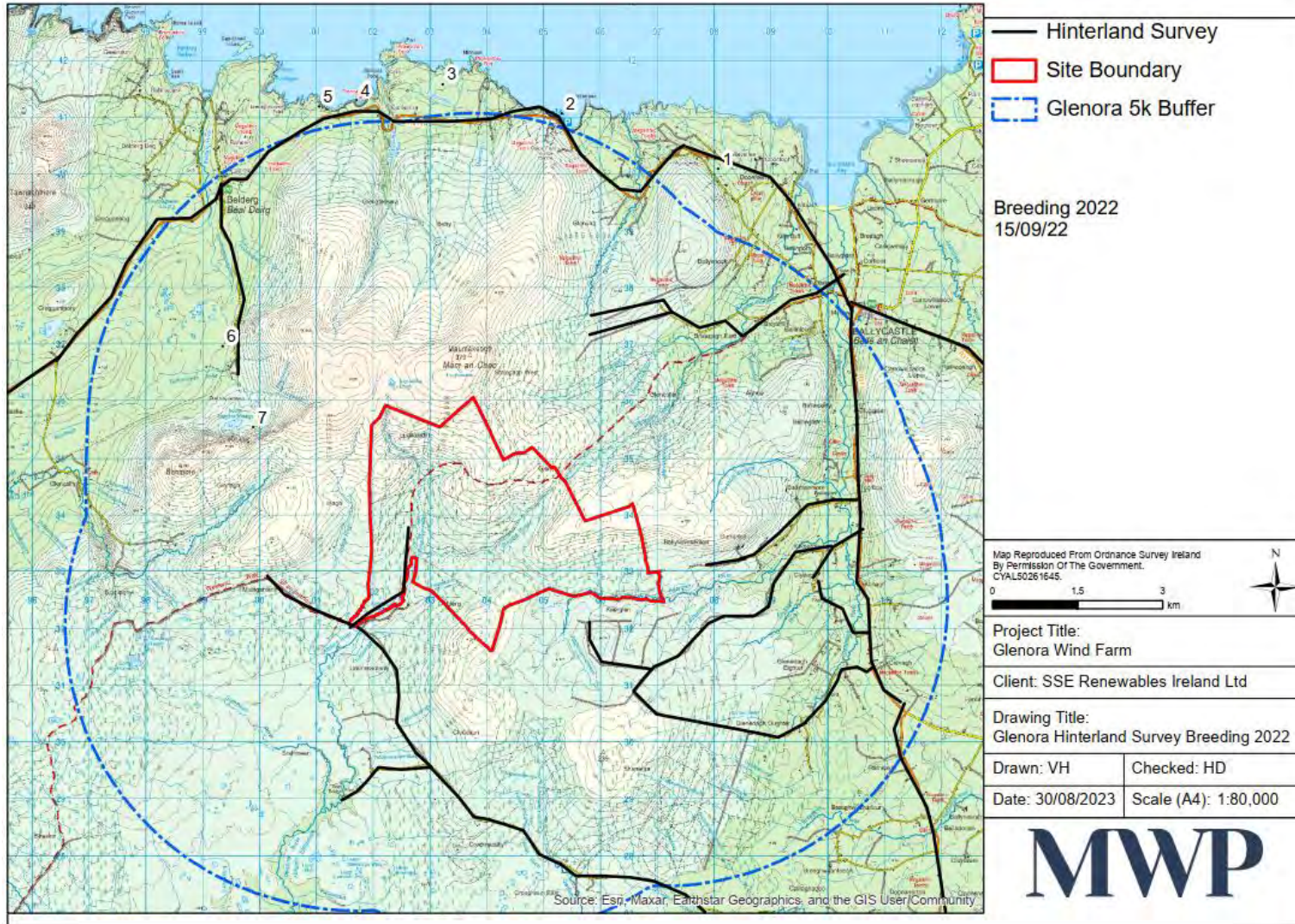


BREEDING 2022**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Driven Transect	15.09.22	SC	09:30	17:00	Mostly cloudy with some bright spells and moderate winds. Cloud cover 7/8 – 8/8. Temperatures 15°C – 16°C

Survey Results

Survey	Date	Observation No.	Target Species Results
Driven Transect See Map 5 below	15.09.22	1	Herring Gull
		2	Great black-backed gull x 3
		3	Herring Gull
		4	Gannet x 3
		5	Chough
		6	Herring Gull
		7	Golden plover



MAP 5



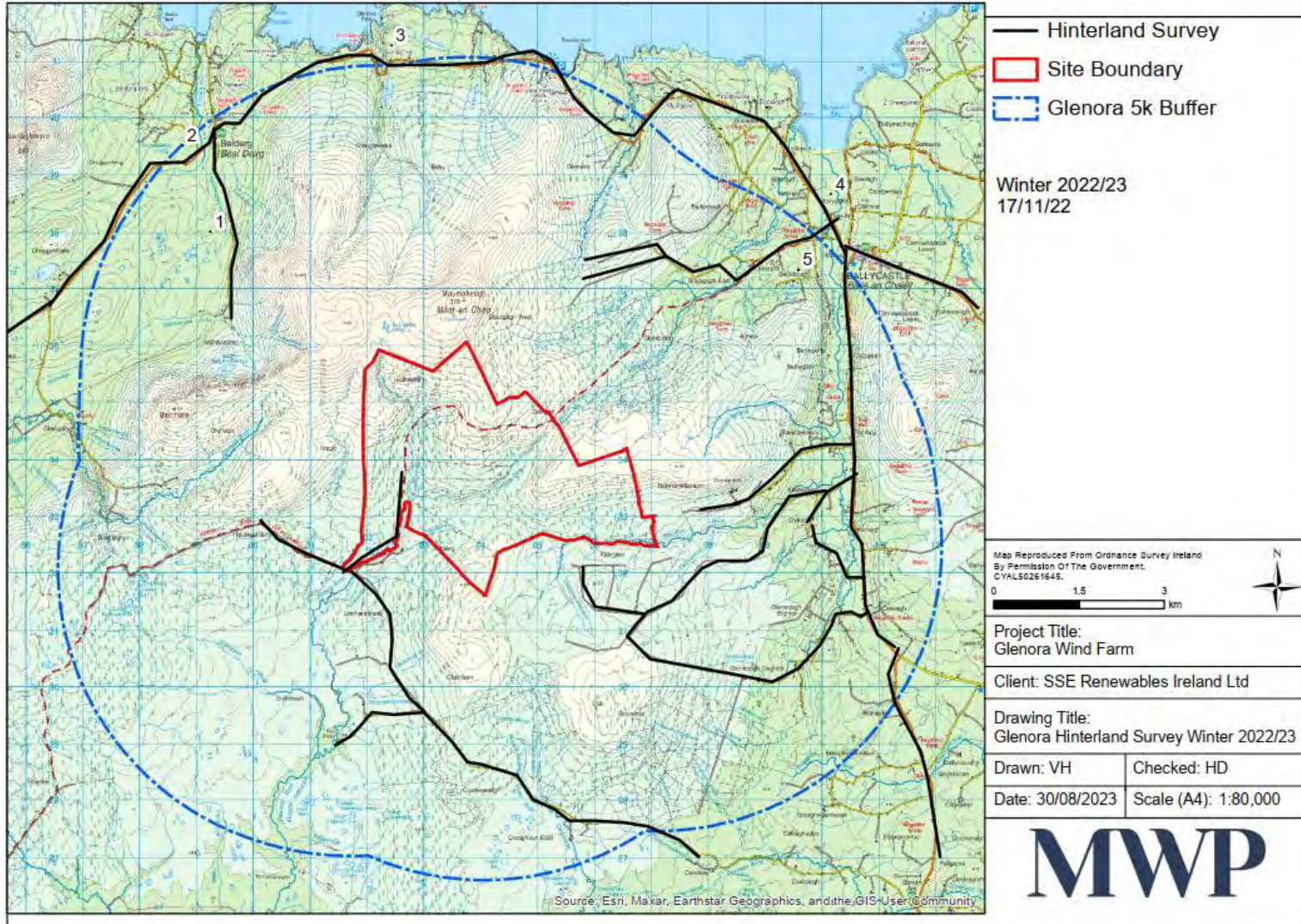
WINTER 2022/23**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather							
					Wind Direction	Wind Speed	Cloud Cover	Visibility	Rain	Frost	Snow	Temp
Driven transect	17.11.22	SC	12:00	17:00	W	3-Gentle Breeze	66-100	Good	None	None	None	10
Driven transect	01.03.23	SC	11:00	17:30	E	3-Gentle Breeze	66-100	Good	None	None	None	7

Survey Results

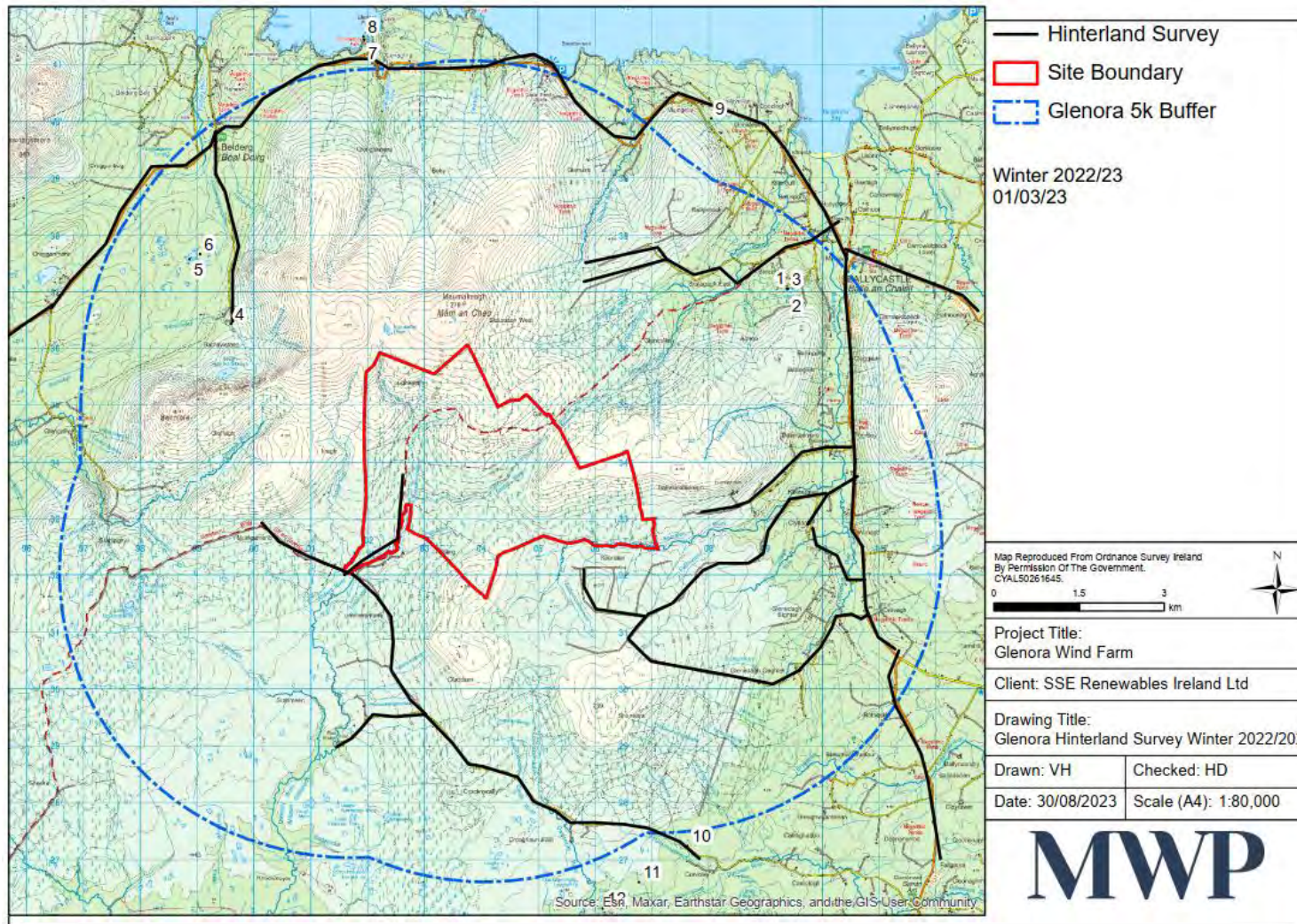
Survey	Date	Observation No.	Notes
Driven Transect See Map 6 below	17.11.22	1	Kestrel flying south up Ballderrig Valley.
		2	Adult herring gull flying west
		3	Peregrine falcon on the ground.
		4	10 common gulls, 1 herring gull and one black-headed gull in fields.
		5	2 wigeon, 12 mallard, 32 teal and 3 moorhen at Killeena Lough.
Driven Transect See Map 7 below	01.03.23	1	2 adult male Wigeon loafing on Killeena Lough
		2	3 male Little Grebe loafing on Killeena Lough
		3	Adult female Teal loafing on Killeena Lough
		4	Jack snipe flushed
		5	Mallard loafing on ponds
		6	3 adult Herring Gull flying north

Survey	Date	Observation No.	Notes
		7	Great Black backed Gull in flight
		8	Herring Gull adult soaring over coast to north
		9	Herring Gull flying south over farmland
		10	Sparrowhawk flying north
		11	70 Golden Plover circling bog to south
		12	A 2nd flock of Golden Plover circling bog



MAP 6





MAP 7



Appendix 12

**List of all Species Recorded
During Surveys**

Breeding 2019

The following table outlines all species recorded during the breeding 2019 surveys at Glenora. A total of 51 species were recorded.

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Blackbird	<i>Turdus merula</i>	1	3	2	1		1
Blue Tit	<i>Parus caeruleus</i>		2				1
Blackcap	<i>Sylvia atricapilla</i>	1	2	2			
Bullfinch	<i>Pyrrhula pyrrhula</i>			1			
Buzzard	<i>Buteo buteo</i>		1				1
Chaffinch	<i>Fringilla coelebs</i>	8	8	7	6	1	4
Chiffchaff	<i>Phylloscopus collybita</i>	6					
Coal Tit	<i>Parus ater</i>	3	3	3	5	8	7
Crossbill	<i>Loxia curvirostra</i>	7	13	4	2	4	4
Cuckoo	<i>Cuculus canorus</i>	1	2				
Dunnock	<i>Prunella modularis</i>	1	2	1	1		2
Goldcrest	<i>Regulus regulus</i>	2	2	2	1	3	4
Golden Plover	<i>Pluvialis apricaria</i>	45	2	1		1	45
Goldfinch	<i>Carduelis carduelis</i>	2					1
Great Black-backed Gull	<i>Larus marinus</i>				1		
Great Tit	<i>Parus major</i>						1
Grey Heron	<i>Ardea cinerea</i>						1
Grey Wagtail	<i>Motacilla cinerea</i>						1
Hen Harrier	<i>Circus cyaneus</i>	1					
Hooded Crow	<i>Corvus cornix</i>	2	2	1	1	2	2
House Martin	<i>Delichon urbicum</i>	1					39
Jackdaw	<i>Corvus monedula</i>						20
Jay	<i>Garrulus glandarius</i>				1		
Kestrel	<i>Falco tinnunculus</i>	1		1		1	1
Linnet	<i>Carduelis cannabina</i>	2	2				
Lesser Black-backed Gull	<i>Larus fuscus</i>			2			
Mallard	<i>Anas platyrhynchos</i>	2		2			
Meadow Pipit	<i>Anthus pratensis</i>	17	12	11	20	10	20
Mistle Thrush	<i>Turdus viscivorus</i>	1	1	1	1	1	
Peregrine	<i>Falco peregrinus</i>						1
Raven	<i>Corvus corax</i>	3	3	3	5	10	45
Red Grouse	<i>Lagopus lagopus hibernicus</i>	1					
Redpoll	<i>Carduelis flammea cabaret</i>	4		1	2		5
Reed Bunting	<i>Emberzia schoenichus</i>	6			2		1
Robin	<i>Erithacus rubecula</i>	3	4	3		1	3
Sand Martin	<i>Riparia riparia</i>	1					
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	2	2			1	
Siskin	<i>Carduelis spinus</i>	6	4	2	4		6
Skylark	<i>Alauda arvensis</i>	8	9	8	12		5

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Shipe	<i>Gallinago galinago</i>		1	3	1		14
Song Thrush	<i>Turdus philomelos</i>	1	2	1	1	1	
Sparrowhawk	<i>Accipiter nisus</i>	1		1	1	2	2
Spotted Flycatcher	<i>Muscicapa striata</i>						1
Starling	<i>Sturnus vulgaris</i>				11		40
Swallow	<i>Hirundo rustica</i>	1			2	4	50
Swift	<i>Apus apus</i>				3		
Whitethroat	<i>Sylvia communis</i>				1		
Willow Warbler	<i>Phylloscopus trochilus</i>	5	5	2	1	1	
Wheatear	<i>Oenanthe Oenanthe</i>	1					1
Woodpigeon	<i>Columba palumbus</i>	4	3		2		
Wren	<i>Troglodytes troglodytes</i>	3	3	3	4	3	3

Winter 2019/20

The following table outlines all species recorded during the winter 2019/20 surveys at Glenora. A total of 35 species were recorded.

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Blackbird	<i>Turdus merula</i>				1		1
Bullfinch	<i>Pyrrhula pyrrhula</i>			1			
Buzzard	<i>Buteo buteo</i>						1
Chaffinch	<i>Fringilla coelebs</i>	1		1		2	12
Coal Tit	<i>Parus ater</i>	10	2	2	5	2	3
Crossbill	<i>Loxia curvirostra</i>	20	10	8	7	6	16
Dunnock	<i>Prunella modularis</i>	1	1				
Goldcrest	<i>Regulus regulus</i>	4	2	1	2	1	2
Golden Plover	<i>Pluvialis apricaria</i>	50		1	80		80
Grey Heron	<i>Ardea cinerea</i>				1		
Hen Harrier	<i>Circus cyaneus</i>	1			1		
Hooded Crow	<i>Corvus cornix</i>	1	1	2	2		3
Jay	<i>Garrulus glandarius</i>				2		
Kestrel	<i>Falco tinnunculus</i>	1	1				
Magpie	<i>Pica pica</i>	1					
Meadow Pipit	<i>Anthus pratensis</i>	10	1	1	8	1	10
Merlin	<i>Falco columbarius</i>					1	
Mistle Thrush	<i>Turdus viscivorus</i>						1
Peregrine	<i>Falco peregrinus</i>	1					
Pied Wagtail	<i>Motacilla alba</i>						1
Raven	<i>Corvus corax</i>	4	3	4	3	5	2
Red Grouse	<i>Lagopus lagopus hibernicus</i>		1				
Redpoll	<i>Carduelis flammea cabaret</i>	6	2	1			2
Reed Bunting	<i>Emberzia schoenichus</i>	1					
Robin	<i>Erithacus rubecula</i>	3	2	1	2	1	2

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Siskin	<i>Carduelis spinus</i>		2		1		12
Skylark	<i>Alauda arvensis</i>						8
Snipe	<i>Gallinago gallinago</i>		5		4	3	1
Song Thrush	<i>Turdus philomelos</i>				1		1
Sparrowhawk	<i>Accipiter nisus</i>	1					
Starling	<i>Sturnus vulgaris</i>	8					
Stonechat	<i>Saxicola torquatus</i>	2	1				2
Woodcock	<i>Scolopax rusticola</i>		1		1		
Woodpigeon	<i>Columba palumbus</i>						3
Wren	<i>Troglodytes troglodytes</i>	2	2	1	3	2	1

Breeding 2020

The following table outlines peak counts for all species recorded during the breeding 2020 surveys at Glenora. A total of 43 species were recorded.

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Blackbird	<i>Turdus merula</i>	2		1			1
Blue Tit	<i>Parus caeruleus</i>	1			1		2
Blackcap	<i>Sylvia atricapilla</i>	2	2	4		1	
Bullfinch	<i>Pyrrhula pyrrhula</i>			2	3		
Chaffinch	<i>Fringilla coelebs</i>	11	11	7	12	6	2
Chiffchaff	<i>Phylloscopus collybita</i>		2				
Coal Tit	<i>Parus ater</i>	5	2	6	3	8	5
Crossbill	<i>Loxia curvirostra</i>	10	9	9	4	6	16
Cuckoo	<i>Cuculus canorus</i>	4	1	2			
Dunnock	<i>Prunella modularis</i>	1	1	2		4	3
Goldcrest	<i>Regulus regulus</i>	1	1	2	5	3	8
Golden Plover	<i>Pluvialis apricaria</i>						40
Goldfinch	<i>Carduelis carduelis</i>	2					1
Grasshopper Warbler	<i>Locustella naevia</i>			1			
Great Tit	<i>Parus major</i>						2
Grey Wagtail	<i>Motacilla cinerea</i>					1	1
Hooded Crow	<i>Corvus cornix</i>	3	1	2	3	4	5
Jay	<i>Garrulus glandarius</i>	2					3
Kestrel	<i>Falco tinnunculus</i>				1	1	2
Linnet	<i>Carduelis cannabina</i>						1
Meadow Pipit	<i>Anthus pratensis</i>	12	17	12	16	32	72
Merlin	<i>Falco columbarius</i>					1	
Mistle Thrush	<i>Turdus viscivorus</i>	1	2	3	1		2
Pheasant	<i>Phasianus colchicus</i>		1	1			
Pied Wagtail	<i>Motacilla alba</i>		1	1			
Raven	<i>Corvus corax</i>		2	2	3	5	6
Red Grouse	<i>Lagopus lagopus hibernicus</i>	1		1		1	

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Redpoll	<i>Carduelis flammea cabaret</i>	5		2		6	2
Reed Bunting	<i>Emberzia schoenichus</i>	1		1			
Robin	<i>Erithacus rubecula</i>	6	3	3	2	6	6
Rook	<i>Corvus frugilegus</i>					2	
Siskin	<i>Carduelis spinus</i>	10	14	9		2	3
Skylark	<i>Alauda arvensis</i>	8	8	12	10	4	4
Snipe	<i>Gallinago gallinago</i>		2		1		1
Song Thrush	<i>Turdus philomelos</i>	2		1	1	1	
Sparrowhawk	<i>Accipiter nisus</i>	1	1			1	2
Stonechat	<i>Saxicola torquatus</i>	2		2			2
Swallow	<i>Hirundo rustica</i>	2	2		17	5	1
Whitethroat	<i>Sylvia communis</i>		1	2			
Willow Warbler	<i>Phylloscopus trochilus</i>	6	5	4	3	1	
Wheatear	<i>Oenanthe Oenanthe</i>	1	1				1
Woodpigeon	<i>Columba palumbus</i>	3	5	3	1		3
Wren	<i>Troglodytes troglodytes</i>	3	3	3	4	7	7

Winter 2020/21

The following table outlines peak counts for all species recorded during the winter 2020/21 surveys at Glenora. A total of 39 species were recorded.

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Blackbird	<i>Turdus merula</i>			1	1		4
Blue Tit	<i>Parus caeruleus</i>	1	1	1			
Bullfinch	<i>Pyrrhula pyrrhula</i>				6	1	1
Chaffinch	<i>Fringilla coelebs</i>		2		1	4	6
Chiffchaff	<i>Phylloscopus collybita</i>				1		
Coal Tit	<i>Periparus ater</i>	3	4	5	24	12	3
Crossbill	<i>Loxia curvirostra</i>	6	2			6	5
Dunnock	<i>Prunella modularis</i>		1	3			3
Goldcrest	<i>Regulus regulus</i>	2	3	2	1	2	3
Goldfinch	<i>Carduelis carduelis</i>	1	1				
Golden Plover	<i>Pluvialis apricaria</i>			15	21	200	2
Great Black-backed Gull	<i>Larus marinus</i>					2	
Grey Wagtail	<i>Motacilla cinerea</i>			1			2
Hen Harrier	<i>Circus cyaneus</i>			1			
Hooded Crow	<i>Corvus cornix</i>	3	1	3	1	2	2
Iceland Gull	<i>Larus glaucooides</i>						1
Jackdaw	<i>Corvus monedula</i>			2			
Jay	<i>Garrulus glandarius</i>	1	1	1			
Kestrel	<i>Falco tinnunculus</i>	1	1				
Magpie	<i>Pica pica</i>			1			
Mallard	<i>Anas platyrhynchos</i>					2	

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Meadow Pipit	<i>Anthus pratensis</i>	10	3	2	3	16	31
Mistle Thrush	<i>Turdus viscivorus</i>					2	1
Peregrine	<i>Falco peregrinus</i>			1			1
Pied Wagtail	<i>Motacilla alba</i>						1
Raven	<i>Corvus corax</i>	4	5	5	8	8	4
Redpoll	<i>Carduelis flammea cabaret</i>	1	1	1			
Reed Bunting	<i>Emberzia schoenichus</i>	1		1	3		
Robin	<i>Erithacus rubecula</i>	3	3	4	5	1	3
Siskin	<i>Carduelis spinus</i>						2
Skylark	<i>Alauda arvensis</i>					3	4
Shipe	<i>Gallinago gallinago</i>	1	1		1	1	
Song Thrush	<i>Turdus philomelos</i>	1		1			
Sparrowhawk	<i>Accipiter nisus</i>			1			
Starling	<i>Sturnus vulgaris</i>			20			
Stonechat	<i>Saxicola torquatus</i>	2		1	2	2	
Woodpigeon	<i>Columba palumbus</i>	21		1			2
Wren	<i>Troglodytes troglodytes</i>	2	3	4	3	3	4

Breeding 2021

The following table outlines peak counts for all species recorded during the breeding 2021 surveys at Glenora. A total of 45 species were recorded.

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Blackbird	<i>Turdus merula</i>	2	2	2	1	1	1
Blackcap	<i>Sylvia atricapilla</i>		1	2	1	1	
Bullfinch	<i>Pyrrhula pyrrhula</i>				1		
Buzzard	<i>Buteo buteo</i>		1	1	1	1	
Chaffinch	<i>Fringilla coelebs</i>	4	4	4	3	3	3
Coal Tit	<i>Parus ater</i>	2	2	2	3	3	9
Crossbill	<i>Loxia curvirostra</i>	4	1		4	2	2
Cuckoo	<i>Cuculus canorus</i>	1	1				
Dunnock	<i>Prunella modularis</i>	1	1	2	2	1	2
Goldcrest	<i>Regulus regulus</i>	3	2	3	3	2	4
Golden Plover	<i>Pluvialis apricaria</i>	23	1				1
Great Black-backed Gull	<i>Larus marinus</i>		1				1
Grey Wagtail	<i>Motacilla cinerea</i>	1	4	2	1	2	1
Hooded Crow	<i>Corvus cornix</i>		2	2	2	2	4
Jay	<i>Garrulus glandarius</i>			1			5
Kestrel	<i>Falco tinnunculus</i>		1			1	1
Lapwing	<i>Vanellus vanellus</i>		1				
Linnet	<i>Carduelis cannabina</i>	1					4
Magpie	<i>Pica pica</i>					1	
Meadow Pipit	<i>Anthus pratensis</i>	34	8	10	18	6	110

Common Name	Scientific Name	Apr	May	Jun	Jul	Aug	Sep
Mistle Thrush	<i>Turdus viscivorus</i>	1	2	2	2	1	
Peregrine	<i>Falco peregrinus</i>					1	
Pied Wagtail	<i>Motacilla alba</i>					2	1
Raven	<i>Corvus corax</i>	3	2	4	4	4	46
Red Grouse	<i>Lagopus lagopus hibernicus</i>	1	1		1	1	
Redpoll	<i>Carduelis flammea cabaret</i>	1	1	1	4		1
Robin	<i>Erithacus rubecula</i>	4	3	2	3	2	6
Rook	<i>Corvus frugilegus</i>		1				
Sand Martin	<i>Riparia riparia</i>	1	1		4		1
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>				1		
Siskin	<i>Carduelis spinus</i>	5	8	3	4	1	2
Skylark	<i>Alauda arvensis</i>	10	10	10	10		3
Snipe	<i>Gallinago gallinago</i>	3	1		1		2
Song Thrush	<i>Turdus philomelos</i>	1	2	2	1		2
Sparrowhawk	<i>Accipiter nisus</i>		1		1		
Stonechat	<i>Saxicola torquatus</i>	2		2	2		
Swallow	<i>Hirundo rustica</i>				4	12	5
Swift	<i>Apus apus</i>				1		
Teal	<i>Anas crecca</i>						2
Whitethroat	<i>Sylvia communis</i>			1	1		
Willow Warbler	<i>Phylloscopus trochilus</i>	6	6	2	3	1	
Wheatear	<i>Oenanthe Oenanthe</i>	2			2	2	1
Woodpigeon	<i>Columba palumbus</i>	2	3	6	3		1
Wren	<i>Troglodytes troglodytes</i>	4	5	5	5	3	5

Winter 2021/22

The following table outlines peak counts for all species recorded during the winter 2021/22 surveys at Glenora. A total of 44 species were recorded.

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Blackbird	<i>Turdus merula</i>	2	1	2	2		2
Blue Tit	<i>Parus caeruleus</i>			1	2		
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	1	1	6		
Chaffinch	<i>Fringilla coelebs</i>	3	1		6	1	4
Chiffchaff	<i>Phylloscopus collybita</i>						1
Coal Tit	<i>Parus ater</i>	4	5	4	12	3	5
Cormorant	<i>Phalacrocorax carbo</i>				1		
Crossbill	<i>Loxia curvirostra</i>	4	6	3	3	1	2
Dunnock	<i>Prunella modularis</i>	1	1	1	1		2
Fieldfare	<i>Turdus pilaris</i>				66		
Goldcrest	<i>Regulus regulus</i>	2	2	1	2	3	4
Golden Plover	<i>Pluvialis apricaria</i>	87	25	175	52	18	146
Goldfinch	<i>Carduelis carduelis</i>	1	1	4	3		

Common Name	Scientific Name	Oct	Nov	Dec	Jan	Feb	Mar
Great Black-backed Gull	<i>Larus marinus</i>						1
Great Tit	<i>Parus major</i>	1		1			
Grey Wagtail	<i>Motacilla cinerea</i>	1					1
Hen Harrier	<i>Circus cyaneus</i>					1	
Hooded Crow	<i>Corvus cornix</i>	2	2		2	1	5
Jack Snipe	<i>Lymnocyptes minimus</i>				2		
Jay	<i>Garrulus glandarius</i>	1			2		
Kestrel	<i>Falco tinnunculus</i>	2	1				
Linnet	<i>Carduelis cannabina</i>	1					
Mallard	<i>Anas platyrhynchos</i>						1
Meadow Pipit	<i>Anthus pratensis</i>	22	13	3	16	6	10
Mistle Thrush	<i>Turdus viscivorus</i>	15			1	2	2
Peregrine	<i>Falco peregrinus</i>	1			1		
Pied Wagtail	<i>Motacilla alba</i>	2					
Raven	<i>Corvus corax</i>	8	7	6	7	4	12
Red Grouse	<i>Lagopus lagopus hibernicus</i>			2	1		
Redpoll	<i>Carduelis flammea cabaret</i>	5	2	10	1		4
Redwing	<i>Turdus iliacus</i>	20	1				
Reed Bunting	<i>Emberzia schoenichus</i>	1	1	1	4		
Robin	<i>Erithacus rubecula</i>	4	3	2	4	2	6
Siskin	<i>Carduelis spinus</i>	1	1				6
Skylark	<i>Alauda arvensis</i>	4					4
Snipe	<i>Gallinago gallinago</i>	158		1	3		
Snow Bunting	<i>Plectrophenax nivalis</i>	1	2				
Song Thrush	<i>Turdus philomelos</i>	1		1	1	1	3
Sparrowhawk	<i>Accipiter nisus</i>	1					1
Stonechat	<i>Saxicola torquatus</i>	3		1	1	1	
Whooper Swan	<i>Cygnus cygnus</i>	14					
Woodcock	<i>Scolopax rusticola</i>			8	1	5	12
Woodpigeon	<i>Columba palumbus</i>				1		4
Wren	<i>Troglodytes troglodytes</i>	4	3	2	5	2	6

Breeding 2022

The following table outlines peak counts for all species recorded during the 2022 breeding season at Glenora. A total of 45 species were recorded.

Common Name	Scientific Name	April	May	June	July	Aug	Sep
Blackbird	<i>Turdus merula</i>	1	2	1	1	1	1
Blackcap	<i>Sylvia atricapilla</i>		1	1	2		
Blue Tit	<i>Parus caeruleus</i>		2			2	
Bullfinch	<i>Pyrrhula pyrrhula</i>		2		1	4	
Buzzard	<i>Buteo buteo</i>	1		3	2	2	
Chaffinch	<i>Fringilla coelebs</i>	5	4	2	3	3	3

Common Name	Scientific Name	April	May	June	July	Aug	Sep
Chiffchaff	<i>Phylloscopus collybita</i>		1	1			
Coal Tit	<i>Periparus ater</i>	4	4	1	5	5	5
Cormorant	<i>Phalacrocorax carbo</i>					1	
Crossbill	<i>Loxia curvirostra</i>	2	9	2	1	6	14
Cuckoo	<i>Cuculus canorus</i>		1	1			
Dunnock	<i>Prunella modularis</i>	1	2		1	3	2
Goldcrest	<i>Regulus regulus</i>	3	2	2	5	3	3
Golden Plover	<i>pluviaris apricaria</i>	62					
Goldfinch	<i>Carduelis carduelis</i>						2
Great Black-backed Gull	<i>Larus marinus</i>	2			1		
Grey Heron	<i>Ardea cinerea</i>		1		2		
Grey Wagtail	<i>Motacilla cinerea</i>	1	2	3	2	3	1
Hooded Crow	<i>Corvus cornix</i>	2	3	3	2	2	2
House Martin	<i>Delichon urbicum</i>		1			5	4
Jay	<i>Garrulus glandarius</i>	2		1		2	6
Kestrel	<i>Falco tinnunculus</i>		1	1	1	2	1
Linnet	<i>Carduelis cannabina</i>						1
Meadow Pipit	<i>Anthus pratensis</i>	9	8	10	12	25	37
Mistle Thrush	<i>Turdus viscivorus</i>	2				1	16
Pied Wagtail	<i>Motacilla alba</i>				1		1
Raven	<i>Corvus corax</i>	2	3	2	3	5	16
Red Grouse	<i>Lagopus lagopus hibernicus</i>	1	1	1			
Redpoll	<i>Carduelis flammea cabaret</i>	1		2	2	4	1
Reed Bunting	<i>Emberzia schoenichus</i>					1	1
Robin	<i>Erithacus rubecula</i>	3	3	5	6	4	5
Sand Martin	<i>Riparia riparia</i>					1	
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>			1			
Siskin	<i>Carduelis spinus</i>	5	3	2	2	2	1
Skylark	<i>Alauda arvensis</i>	3	4	6	5	3	4
Snipe	<i>Gallinago gallinago</i>	0	2	2	1		1
Song Thrush	<i>Turdus philomelos</i>	1		1	1	1	1
Sparrowhawk	<i>Accipiter nisus</i>					1	1
Stonechat	<i>Saxicola torquatus</i>				2	2	1
Swallow	<i>Hirundo rustica</i>		2		2	26	12
Swift	<i>Apus apus</i>			1	2		
Wheatear	<i>Oenanthe oenanthe</i>		2	2		1	
Willow Warbler	<i>Phylloscopus trochilus</i>	3	4	2	3	3	
Woodpigeon	<i>Columba palumbus</i>	7	3	8		1	2
Wren	<i>Troglodytes troglodytes</i>	3	8	3	5	4	4

Winter 2022/23

The following table outlines peak counts for all species recorded during the winter 2022/23 surveys at Glenora. A total of 42 species were recorded.

Common Name	Scientific Name	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
Blackbird	<i>Turdus merula</i>	1		1			2
Bullfinch	<i>Pyrrhula pyrrhula</i>		1	1			
Coal Tit	<i>Periparus ater</i>	3	12	5	3	6	1
Chaffinch	<i>Fringilla coelebs</i>	1	2	1	1	3	1
Chiffchaff	<i>Phylloscopus collybita</i>						1
Crossbill	<i>Loxia curvirostra</i>	2	4	2	3	3	
Dunnock	<i>Prunella modularis</i>	2	3	2			
Dipper	<i>Cinclus cinclus</i>				1		
Great northern diver	<i>Gavia immer</i>		2				
Grey heron	<i>Ardea cinerea</i>					1	
Goldcrest	<i>Regulus regulus</i>	2	2	3	1	3	
Fieldfare	<i>Turdus pilaris</i>	4	1	15			
Golden Plover	<i>pluviaris apricaria</i>	86	86	27	2	28	
Grey Wagtail	<i>Motacilla cinerea</i>	1					
Hen Harrier	<i>Circus cyaneus</i>	1				1	
Hooded Crow	<i>Corvus cornix</i>	2	1	2	1	2	
Jay	<i>Garrulus glandarius</i>	1	1				
Jack Snipe	<i>Lymnocyptes minimus</i>		1				
Kestrel	<i>Falco tinnunculus</i>	1	2				
Mallard	<i>Anas platyrhynchos</i>						1
Meadow Pipit	<i>Anthus pratensis</i>	12	5	4	2	12	6
Merlin	<i>Falco columbarius</i>						1
Mistle Thrush	<i>Turdus viscivorus</i>			1		1	
Pied Wagtail	<i>Motacilla alba</i>	1					
Raven	<i>Corvus corax</i>	6	8	6	6	5	2
Redpoll	<i>Carduelis flammea cabaret</i>	1	1	1	1	1	
Red Grouse	<i>Lagopus lagopus hibernicus</i>	2		4		3	
Peregrine	<i>Falco peregrinus</i>	1					
Reed Bunting	<i>Emberzia schoenichus</i>	1	6	2	1		
Robin	<i>Erithacus rubecula</i>	3	3	4	1	3	2
Redwing	<i>Turdus iliacus</i>	1	8	2			
Skylark	<i>Alauda arvensis</i>	3				2	6
Siskin	<i>Carduelis spinus</i>	1	2	2		3	
Song Thrush	<i>Turdus philomelos</i>	1	2	1		1	
Stonechat	<i>Saxicola torquatus</i>	2					
Sparrowhawk	<i>Accipiter nisus</i>		1	2			
Snipe	<i>Gallinago gallinago</i>	32	1	3	2		
Teal	<i>Anas crecca</i>		1				
Whooper Swan	<i>Cygnus cygnus</i>			8			
Woodpigeon	<i>Columba palumbus</i>	1	1				2

Common Name	Scientific Name	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
Wren	<i>Troglodytes troglodytes</i>	3	3	4	1	3	1
Woodcock	<i>Scolopax rusticola</i>	1		6	2	1	

Appendix 13

Species Previously Recorded in the Area from Desktop Study

The following table outlines all species which have been previously recorded in the relevant hectad G03 as per the desktop study and which are either of conservation concern and/or are afforded a higher level of legislative protection in an Irish or European context, including their wintering and breeding status, as per the Bird Atlas (2007 – 2013). Annex I bird species are highlighted in bold.

Species Name	Winter Atlas 2007-11	Breeding Atlas 2007-11	Conservation/Protection Status
Great Northern Diver (<i>Gavia immer</i>)	Present	Present	BoCCI Amber-listed / Annex I EU Birds Directive / Wildlife Acts
Golden Plover (<i>Pluvialis apricaria</i>)	Present	Probable	BoCCI – Red-List/ Annex I EU Birds Directive/ Wildlife Acts
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Present	Absent	BoCCI – Red-List/Annex I EU Birds Directive /Wildlife Acts
Dunlin (<i>Calidris alpina</i>)	Present	Present	BoCCI – Red-List/ Annex I EU Birds Directive /Wildlife Acts
Hen Harrier (<i>Circus cyaneus</i>)	Present	Present	BoCCI - Amber List/ Annex I EU Birds Directive/Fourth schedule of the Wildlife Acts
Merlin (<i>Falco columbarius</i>)	Present	Present	BoCCI - Amber List/ Annex I EU Birds Directive/ Fourth schedule of the Wildlife Acts
Chough (<i>Pyrhocorax pyrrhocorax</i>)	Present	Absent	BoCCI - Amber List/ Annex I EU Birds Directive/ Wildlife Acts
Mallard (<i>Anas platyrhynchos</i>)	Present	Possible	BoCCI Amber-listed / Wildlife Acts
Red Grouse (<i>Lagopus lagopus hibernicus</i>)	Present	Probable	BoCCI - Red List/ Wildlife Acts
Teal (<i>Anas crecca</i>)	Absent	Confirmed	BoCCI - Amber List / Wildlife Acts
Snipe (<i>Gallinago gallinago</i>)	Present	Probable	BoCCI – Red-List / Wildlife Acts
Woodcock (<i>Scolopax rusticola</i>)	Present	Absent	BoCCI – Red List / Wildlife Acts
Curlew (<i>Numenius arquata</i>)	Present	Absent	BoCCI - Red List / Wildlife Acts
Swallow (<i>Hirundo rustica</i>)	Absent	Confirmed	BoCCI - Amber List/ Wildlife Acts
Kestrel (<i>Falco tinnunculus</i>)	Present	Confirmed	BoCCI – Red-List/ Wildlife Acts
Linnet (<i>Carduelis cannabina</i>)	Present	Probable	BoCCI - Amber List/ Wildlife Acts
Starling (<i>Sturnus vulgaris</i>)	Present	Confirmed	BoCCI - Amber List/ Third schedule of the Wildlife Acts
Oystercatcher (<i>Haematopus ostralegus</i>)	Present	Present	BoCCI – Red-List/ Wildlife Acts
Shag (<i>Phalacrocorax aristotelis</i>)	Absent	Present	BoCCI - Amber List/ Wildlife Acts
House Martin (<i>Delichon urbicum</i>)	Absent	Possible	BoCCI - Amber List/ Wildlife Acts
House Sparrow (<i>Passer domesticus</i>)	Present	Confirmed	BoCCI - Amber List/ Third schedule of the Wildlife Acts
Common/Mew Gull (<i>Larus canus</i>)	Present	Absent	BoCCI - Amber List/ Wildlife Acts
Northern Wheatear (<i>Oenanthe oenanthe</i>)	Absent	Probable	BoCCI - Amber List/ Wildlife Acts
Ringed Plover (<i>Charadrius hiaticula</i>)	Present	Present	BoCCI - Amber List/ Wildlife Acts

Species Name	Winter Atlas 2007-11	Breeding Atlas 2007-11	Conservation/Protection Status
Sand Martin (<i>Riparia riparia</i>)	Absent	Confirmed	BoCCI - Amber List/ Wildlife Acts
Skylark (<i>Alauda arvensis</i>)	Absent	Probable	BoCCI - Amber List/ Wildlife Acts
Black-headed Gull (<i>Larus ridibundus</i>)	Present	Absent	BoCCI - Amber List/ Wildlife Acts
Redshank (<i>Tringa totanus</i>)	Present	Absent	BoCCI – Red- List/ Wildlife Acts
Herring Gull (<i>Larus argentatus</i>)	Present	Absent	BoCCI - Amber List/ Third schedule of the Wildlife Acts
Sparrowhawk (<i>Accipiter nisus</i>)	Present	Possible	BoCCI Green-listed/ Fourth schedule of the Wildlife Acts
Common Buzzard (<i>Buteo buteo</i>)	Absent	Absent	BoCCI Green-listed/ Fourth schedule of the Wildlife Acts
Goldcrest (<i>Regulus regulus</i>)	Present	Possible	BoCCI Amber-listed/ Wildlife Acts
Grey Wagtail (<i>Motacilla cinerea</i>)	Present	Possible	BoCCI Red-listed/ Wildlife Acts
Meadow Pipit (<i>Anthus pratensis</i>)	Present	Confirmed	BoCCI Red-listed/ Wildlife Acts
Ruddy Turnstone (<i>Arenaria interpres</i>)	Present	Present	BoCCI Amber-listed/ Wildlife Acts
Willow Warbler (<i>Phylloscopus trochilus</i>)	Absent	Confirmed	BoCCI Amber listed/ Wildlife Acts

Appendix 14

Non-core Bird Survey Data Summary

Non-Core Bird Surveys (Wider Hinterland Area Surveys)

BREEDING 2019

Survey Summary

Survey	Date	Observer	Start Time	Finish Time	Weather
Ballycastle strand - count	17.07.19	SC	11:40	12:00	Mostly cloudy with persistent misty rain. Cloud 8/8 Wind SW F2-3.
Downpatrick Head – count and transect	18.07.19	SC	-	-	-
Downpatrick Head – count and transect	19.09.19	SC	-	-	-

Survey Results

Survey	Date	Target/Secondary Species Records
Ballycastle strand - count	17.07.19	Common gull (58) Lesser black-backed gull (7) Herring gull (1) Great black-backed gull (10) Black-headed gull (5) Sandwich tern (2) Common sandpiper (2) Curlew (4) Oystercatcher (5) Ringed plover (4)

Survey	Date	Target/Secondary Species Records
		Grey heron (1)
Downpatrick Head – count and transect	18.07.19	Guillemot Common Gull Fulmer Razorbill Kittiwake Chough Peregrine falcon Great Skua Lesser black-backed Gull Great Black-backed gull Herring Gull Gannet
Downpatrick Head – count and transect	19.09.19	Artic skua Peregrine falcon Great Skua

WINTER 2019/20**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Ballycastle Strand	17.12.19	SC & JC	-	-	
Ballycastle Strand	23.01.20	SC & JC	09:30	09:55	Overcast, cloud cover 8/8, wind direction south west, wind F2-3, temp 6oC, visibility good.

Survey results

Survey	Date	Target/Secondary Species Records
Ballycastle Strand	17.12.19	Redshank (2) Curlew (19) Oystercatcher (43) Sanderling (24) Ringed plover (32) Knot (3) Dunlin (1) Great northern diver (2) Cormorant (1) Common gull (90) Great black-backed gull (1) Herring gull (1) Black-headed gull (22)
Ballycastle Strand	23.01.20	Curlew (5) Oystercatcher (18)

Survey	Date	Target/Secondary Species Records
		Sanderling (92) Ringer plover (47) Dunlin (37) Great northern diver (5) Cormorant (2) Common gull (100) Great black-backed gull (2) Herring gull (2) Black-headed gull (3) Iceland gull (1) Turnstone (10)

BREEDING 2020**Survey Summary**

Survey	Date	Observer	Weather
Ballycastle strand	17.06.20	JNM	Dry, temp 18°C, wind direction north, F2-4.
Downpatrick Head.	17.06.20	JNM	Dry, temp 18°C, wind direction north, F2-4.

Survey Results

Survey	Date	Target/Secondary Species Records
Ballycastle Strand	17.06.20	Ringed plover Guillemot Great northern diver
Downpatrick Head	17.06.20	Peregrine falcon Guillemot Razorbill Kittiwake Ringed plover Manx shearwater

BREEDING 2021**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Downpatrick Head	28.06.21	PC	09.00	15:30	Dry and dull but sunny after lunch with cloud cover 8/8, wind direction north, wind F1-2, temp 11°C

Survey Results

Survey	Date	Target/Secondary Species Records
Downpatrick Head	28.06.21	Razorbill (9) Common guillemot (1,050) Kittiwake (1,230) Herring gulls (30) Lesser black-backed gull (1) Great northern diver (4) Fulmar (22) Manx shearwater (14) Peregrine falcon 2 (2 chicks on the traditional nesting site, nearly fully fledged, no parents observed)

WINTER 2021/22**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Ballycastle Strand	13.10.21	-	-	-	-
	15.10.21	-	-	-	-
	10.11.21	-	-	-	-
	18.11.21	-	-	-	-
	14.01.22	-	-	-	-
	08.02.22	-	-	-	-
	03.03.22	-	-	-	-

Survey Results

Species	13.10.21	15.10.21	10.11.21	18.11.21	14.01.22	08.02.22	03.03.22
Black-headed Gull (<i>Larus ridibundus</i>)	24	25	1		7	10	13
Common Gull (<i>Larus canus</i>)		58	28		148	10	41
Cormorant (<i>Phalacrocorax carbo</i>)	10	1			3	1	
Curlew (<i>Numenius arquata</i>)	4	1					
Dunlin (<i>Calidris alpina</i>)						41	17
Great Black-back Gull (<i>Larus marinus</i>)		1				2	2
Great northern diver (<i>Gavia immer</i>)	1	1	4		5	2	3
Herring Gull (<i>Larus argentatus</i>)		28	2	4	3	43	4
Kittiwake (<i>Rissa tridactyla</i>)						6	
Lapwing (<i>Vanellus vanellus</i>)	1						
Oystercatcher (<i>Haematopus ostralegus</i>)	4	5	15	2	31		9
Redshank (<i>Tringa tetanus</i>)							1
Ringed plover (<i>Charadrius hiaticula</i>)	67	92	39		137	13	5
Sanderling (<i>Calidris alba</i>)	58	62	58		101	62	71
Shag (<i>Phalacrocorax aristotelis</i>)					4	1	
Turnstone (<i>Arenaria interpres</i>)						8	

BREEDING 2022**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Downpatrick Head	29.06.22	SC	13.20	16.30	A bright day with a mixture of sunshine, cloud and strong winds. Temperature 14°C.

Survey Results

Survey	Date	Target/Secondary Species Records
Downpatrick Head	29.06.22	Fulmar 61 Herring gull 12 Guillemot 1462 Kittiwake 1052 Razorbill 23 Gannet 18 Great black-backed gull 1 Shag 2 Peregrine pair nesting on Dun Briste with two chicks

WINTER 2022/23**Survey Summary**

Survey	Date	Observer	Start Time	Finish Time	Weather
Ballycastle Strand	18.11.22	PC	11:30	12:30	Dry, light south-westerly breeze, cloud cover 4-5/8

Survey Results

Survey	Date	Target/Secondary Species Records
Ballycastle Strand	18.11.22	Black Guillemot (4) Black Headed Gull (6) Curlew (37) Common Gull (47) Cormorant (7) Dunlin (48) Great northern diver (4) Great Black-backed Gull (6) Herring Gull (47) Lapwing (2) Ringed plover (112) Shag (3) Redshank (1) Sanderling (113) Turnstone (91)

Appendix 15
Collision Risk Assessment

Collision Risk Assessment

Glenora Wind Farm





DOCUMENT DETAILS

Client: **SSE Renewables**

Project Title: **Glenora Wind Farm**

Project Number: **201120**

Document Title: **Collision Risk Assessment**

Document File Name: **201120 – CRA – 2023.07.12– F**

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1. INTRODUCTION

This document outlines the methodology used to assess the collision risk for birds at the proposed Glenora Wind Farm, Co. Mayo. The collision risk assessment is based on vantage point surveys undertaken at the wind farm site from April 2019 to March 2023 inclusive. This represents a 48-month survey period, consisting of four breeding seasons and four winter seasons. Surveys were undertaken from six fixed vantage points¹ (VP1, VP2, VP3, VP4, VP5 & VP7).

Collision risk is calculated using a mathematical model to predict the number of birds that may be killed by collision with moving wind turbine rotor blades. The modelling method used in this collision risk calculation is known as the Band Model (Band *et al.*, 2007) and has been used in a number of studies on bird collision with wind turbines (e.g. Chamberlain *et al.*, 2006; Drewitt and Langston, 2006; Fernley *et al.*, 2006; Madders and Whitfield, 2006). Note that these are theoretical predictions, therefore results must be interpreted with a degree of caution.

Two stages are involved in the Band Model. First, the number of bird transits through the air space swept by the rotor blades of the wind turbines per year is estimated. Then the collision risk for a bird passing through the rotor blades is calculated using a mathematical formula. The product of these provides a theoretical annual collision mortality rate. Finally, a bird avoidance rate is applied to the collision mortality rate to account for birds attempting to avoid collision. This final collision mortality rate informs the assessment of impacts of the wind farm development on key ornithological receptors (KORs) in the EIAR.

¹ Note that VP6 does not cover any of the proposed turbine locations and is therefore omitted from the collision risk analysis.

2. METHODOLOGY

2.1 The Band Model

The Band Model is used to predict the number of bird collisions that might be caused by a wind farm development. It uses species-specific information on bird biometrics, flight characteristics and the expected amount of flight activity, along with turbine-specific information on hub height, rotor diameter, pitch and rotational speed. The 22 No. turbines will be 99m at hub height, with 3 blades of a diameter between 162m, giving a maximum rotor height of 180m and a minimum rotor height of 18m. The model makes a number of assumptions on the turbine design and on biometrics of birds:

1. Birds are assumed to be of a simple cruciform shape.
 2. Turbine blades are assumed to have length, depth and pitch angle, but no thickness.
 3. Birds fly through turbines in straight lines.
 4. Bird flight is not affected by the slipstream of the turbine blade.
- Because the model assumes that no action is taken by a bird to avoid collision, it is recognised that the collision risk figures derived are purely theoretical and represent worst case estimates as birds in flight routinely avoid obstacles in their path.

Two forms of collision risk modelling are outlined by Band *et al.* (2007): a “**Regular Flight Model**” and the “**Random Flight Model**”. A Regular Flight Model is generally applied to situations where flightlines form a regular pattern. This may occur, for example, when birds are using the wind farm site as a commuting corridor between roosting and feeding grounds or migratory routes, as is often observed in geese and swans. The Random Flight Model generally applies to situations where flightlines have no discernible patterns or routes. This is often observed, for example when raptors are in foraging or hunting flights.

The Regular Flight Model predicts the number of transits through a cross-sectional area of the wind farm which represents the width of the commuting corridor. A “risk window” is identified: a 2-dimensional line the width of the wind farm to a 500m buffer of the turbines, multiplied by the rotor diameter. All commuting flights which pass through this risk window within the rotor swept height (potential collision height; PCH) are included in collision risk modelling. Any regular flights more than 500m from the turbine layout can be excluded from analysis. There are a number of key assumptions and limitations:

- The turbine rotor swept area is 2-dimensional, i.e., there is a single row of turbines in the windfarm. This represents all turbines within the commuting corridor accounted for by a single straight-line.
- Bird activity is spatially explicit.
- Birds in an observed flight only cross the turbine area once and do not pass through the cross-section a second time (or multiple times).
- Habitat and bird activity will remain the same over time and be unchanged during the operational stage of the wind farm.
- All flight activity used in the model occurred within the viewshed area calculated at the lowest swept rotor height.

The **Random Flight Model** predicts the number of transits through the wind farm while assuming that all flights within the vantage point viewshed are randomly occurring, i.e., any observed flight could just as easily occur within the wind farm site as outside it. All flights within PCH inside the viewshed are included in the model. There are a number of key assumptions and limitations:

- Bird activity is not spatially explicit, i.e., activity is equal throughout the viewshed area and this is equal to activity in the wind farm area.
- Habitat and bird activity will remain the same over time and be unchanged during the operational stage of the wind farm.
- All flight activity used in the model occurred within the viewshed area calculated at the lowest swept rotor height.

More detail on both the Random and Regular Flight Model calculations are available from SNH: <https://www.nature.scot/wind-farm-impacts-birds-calculating-theoretical-collision-risk-assuming-no-avoiding-action>. In the case of Glenora wind farm, for all species recorded in flight in the wind farm study area, flights were randomly distributed. Therefore, a Random Flight Model conducted for these species.

2.2

Modelling Process

The steps used in the Band Model to derive the collision mortality rate for each species observed at the wind farm site are outlined below.

- Stage 1: Estimate the number of bird transits through the air space swept by the rotor blades of the wind turbines. Transits are calculated using either the “Regular” or “Random” flight model (Band *et al.*, 2007), depending on flight distribution and behaviour.
- Stage 2: Calculate the collision risk for an individual bird flying through a rotating turbine blade. Collision risk is calculated using a formula which incorporates the number of bird transits (Stage 1), individual species’ biometrics, individual species’ flight speed and style, and the proposed turbine parameters. This formula is publicly available on the SNH website: <https://www.nature.scot/wind-farm-impacts-birds-calculating-probability-collision>. Biometrics are available from the British Trust of Ornithology (BTO, 2021) and flight speeds are available from Alerstam *et al.* (2007). For species that can both flap and glide, the mean of the collision risk for flapping and for gliding flight is taken.
- The product of the number of birds transits per year multiplied by the collision risk provides an annual collision mortality rate. This stage in the analysis assumes that birds flying towards the turbines make no attempt to avoid them.
- To account for birds attempting to avoid collision, an avoidance factor is applied to the annual collision mortality rate. This corrects for the ability of the birds to detect and manoeuvre around the turbines. Avoidance rates are available from SNH (2018). Bird avoidance rates are generally 98-99% or higher for most species, based on empirical evidence, targeted studies and literature reviews, and continue to be updated following further studies of bird behaviour and mortality rates at wind farm sites.

The final annual collision risk corrected for avoidance is a “real-world” estimation of the number of collisions that may occur at the wind farm, based on observed bird activity during the vantage point survey period.

2.3

Turbine specifications

Birds in flight within the viewshed at heights between 18-180m above ground level have been included in the collision risk model. The turbine specifications are available in Table 1.

Table 1 Turbine specifications at Glenora wind farm

Wind Farm Component	Scenario Modelled
Number of turbines	22
Blades per turbine rotor	3
Rotor diameter (m)	162
Rotor radius (m)	81
Hub height (m)	99
Swept height (m)	18-180
Pitch of blade (degrees)	6
Maximum chord (m) (i.e. depth of blade)	4.5
Rotational period (s)	6.749
*Turbine operational time	85%

***This operational period of 85% is referenced from a report by the British Wind Energy Association (BWEA) (2007) which identifies the standard operational period of the wind turbines in the UK to be roughly 85%.**

Using the above turbine parameters ensures the 22 No. turbines with a blade diameter of 162m, giving a maximum rotor height of 180 and a minimum rotor height of between 18m are assessed in the analysis.

2.4

Key Ornithological Receptors

The key ornithological receptors (KORs) recorded within PCH during surveys at Glenora were:

- > Buzzard
- > Golden Plover
- > Great Black-backed Gull
- > Grey Heron
- > Hen Harrier
- > Kestrel
- > Lesser Black-backed Gull
- > Mallard
- > Merlin
- > Peregrine
- > Snipe
- > Sparrowhawk
- > Whooper Swan

A CRM was conducted for each of these species. It is acknowledged that the predicted number of transits, and hence predicted rate of collision, for snipe may be largely underestimated, as flight activity for this species is largely crepuscular in nature (during twilight) while the VP survey sample predominantly consists of hours during daylight period when visibility is not an issue. It is assumed that waterbirds (including snipe) are active for 25% of the night along with daylight hours (as per SNH guidance) and this is accounted for in the model.

2.5

Calculation Parameters

The calculation parameters for the vantage point are outlined in Table 2. Bird biometrics are presented in Table 3. Table 4 presents the model input values: bird seconds in flight at PCH (random model) or the number of birds crossing the risk window (regular models) observed from the vantage point during

the relevant survey period. Bird seconds in flight at PCH are calculated by multiplying the number of birds observed per flight by the duration of the flight spent within PCH.

Table 2 Glenora wind farm survey effort and viewshed coverage

Vantage Point	Visible Area at 18m	Risk Area	Turbines visible	Total Survey Effort
VP1	610.12	481.73	10	287.5
VP2	416.13	367.19	7	287
VP3	404.96	397.16	7	283
VP4	560.98	386.57	8	287
VP5	582.3	171.62	4	289
VP7	348.29	175.5	4	291.25

Table 3 Bird biometrics

Species	Body Length(m)	Wingspan(m)	Flight Speed(m/s)
Buzzard	0.54	1.205	11.6
Golden Plover	0.275	0.715	17.9
Great Black-backed Gull	0.71	1.575	13.7
Grey Heron	0.94	1.85	12.5
Hen Harrier	0.48	1.1	9.1
Kestrel	0.335	0.755	10.1
Lesser Black-backed Gull	0.58	1.425	11.9
Mallard	0.565	0.895	18.5
Merlin	0.275	0.56	10.9
Peregrine	0.445	1.05	12.1
Snipe	0.255	0.42	17.1
Sparrowhawk	0.33	0.625	10
Whooper Swan	1.5	2.2	17.3

Table 4 Model input values

Species	Model	Period	Bird Seconds
Buzzard	random	All	4,050 seconds
Golden Plover	random	September to April	115,696 seconds
Great Black-backed Gull	random	All	826 seconds
Grey Heron	random	All	143 seconds
Hen Harrier	random	October to April	519 seconds
Kestrel	random	All	13,381 seconds
Lesser Black-backed Gull	random	Breeding	17 seconds
Mallard	random	All	1,155 seconds
Merlin	random	All	90 seconds
Peregrine	random	All	357 seconds
Snipe	random	All	2,483 seconds
Sparrowhawk	random	All	1,624 seconds
Whooper Swan	random	Winter	1,470 seconds

The avoidance rates applied to the collision risk were: 99.5% for whooper swan, 99% for hen harrier; 98% for buzzard, golden plover, great black-backed gull, grey heron, mallard, merlin, peregrine, snipe and sparrowhawk; and 95% for kestrel.

3.

RESULTS

The predicted number of transits per year and the collision risk is presented in Table 5, along with the final predicted number of collisions per year. Note that for birds that both flap and glide, the average collision risk percentage between flapping and gliding is taken.

Table 5 Results of CRM

Species	Survey Period	Model	Transits	Collision Risk			Collision Rate			Estimated Collisions Over Lifetime of Wind Farm	One Bird Collision
				flapping	gliding	overall	without avoidance	avoidance factor	with avoidance		
Buzzard	All	random	317.3	5.6%	5.44%	5.52%	17.51	98%	0.35	12.26 birds	3 years
Golden Plover	September to April	random	12347.2	4.25%	no gliding flight	4.25%	524.54	98%	10.491	367.18 birds	<1 year
Great Black-backed Gull	All	random	69.8	5.96%	5.7%	5.83%	4.07	98%	0.081	2.85 birds	12 years
Grey Heron	All	random	10.3	6.96%	no gliding flight	6.96%	0.71	98%	0.014	0.5 birds	70 years
Hen Harrier	October to April	random	22.2	5.82%	5.69%	5.75%	1.28	99%	0.013	0.45 birds	78 years
Kestrel	All	random	914.6	4.91%	4.82%	4.87%	44.53	95%	2.226	77.92 birds	<1 year
Lesser Black-backed Gull	Breeding	random	1.4	5.78%	5.55%	5.66%	0.08	98%	0.002	0.05 birds	637 years
Mallard	All	random	122.5	4.86%	no gliding flight	4.86%	5.96	98%	0.119	4.17 birds	8 years
Merlin	All	random	5	4.53%	4.46%	4.5%	0.23	98%	0.005	0.16 birds	220 years
Peregrine Falcon	All	random	25.1	5.16%	5%	5.08%	1.28	98%	0.026	0.89 birds	39 years



Species	Survey Period	Model	Transits	Collision Risk			Collision Rate			Estimated Collisions Over Lifetime of Wind Farm	One Bird Collision
				flapping	gliding	overall	without avoidance	avoidance factor	with avoidance		
Snipe	All	random	256.1	4.07%	no gliding flight	4.07%	10.42	98%	0.208	7.29 birds	5 years
Sparrowhawk	All	random	99.2	4.87%	4.81%	4.84%	4.8	98%	0.096	3.36 birds	10 years
Whooper Swan	Winter	random	144.6	7.54%	no gliding flight	7.54%	10.9	99.5%	0.054	1.91 birds	18 years

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