

Response to Observations Received

Ballivor Wind Farm (ABP
Ref. 316212)





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Contents

1.	INTRODUCTION	2
1.1	Background to the Proposed Development	2
2.	RESPONSE TO OBSERVATIONS:.....	4
2.1.1	Landscape & Visual	5
2.1.2	Archaeology & Cultural Heritage	11
2.1.3	Ecology/Biodiversity	15
2.1.4	Ornithology.....	25
2.1.5	Hydrology	32
2.1.6	Shadow Flicker	38
2.1.7	Property Value.....	42
2.1.8	Human Health	43
2.1.9	Carbon Release	46
2.1.10	Telecoms and Aviation.....	49
2.1.11	Employment	50
2.1.12	Tourism.....	50
2.1.13	Construction and Decommissioning	51
2.1.14	Cumulative Assessment.....	52
2.1.15	Scoping	53
2.1.16	Consideration of Alternatives.....	53
2.1.17	Roads and Traffic.....	54
2.1.18	Noise and Vibration	56
2.1.19	Land Ownership.....	62
2.1.20	Community Consultation	63
2.1.21	Planning.....	65
3.	RESPONSE TO LOCAL AUTHORITY REPORTS	69
3.1	Meath County Council Recommendations.....	69
3.1.1	Recommendation 1: Cumulative Impacts on Archaeological, Architectural, Cultural Heritage, Landscape, EIAR & NIS	69
3.1.2	Recommendation 2: Noise, Vibration & Shadow Flicker	90
3.1.3	Recommendation 3: Biodiversity/Ornithology	92
3.1.4	Recommendation 4: Borrow Pits	95
3.1.5	Recommendation 5: Amenity Pathways and Carparks & Signage	96
3.1.6	Recommendation 6 Electricity Substation Compound.....	97
3.1.7	Recommendation 7 Material Assets.....	98
3.1.8	Hydrology and Hydrogeology.....	98
3.2	Westmeath County Council	101
4.	CONCLUSION	102
	<i>Figure 1. Causetown Tower House Field of View.....</i>	<i>9</i>
	<i>Figure 2. Barrow at Rathwire Upper Photowire.....</i>	<i>10</i>
	<i>Figure 3. Noise Survey Location B at house H125.....</i>	<i>57</i>
	<i>Figure 4. Cumulative Wind Farm Map.....</i>	<i>75</i>
	<i>Figure 5. Record of Protected Structures Cumulative Context Map.....</i>	<i>86</i>
	<i>Figure 6. Half Blade ZTV Map.....</i>	<i>89</i>
	<i>Figure 7. Borrow Pit Locations.....</i>	<i>96</i>
	<i>Figure 8. Location of CCTV Cameras on Lighting Column.....</i>	<i>97</i>

1.

INTRODUCTION

MKO have been instructed by the applicant, Bord Na Móna Powergen Ltd., to prepare a response to the request issued by An Bord Pleanála (the Board) on the 20th of June 2023 (Third Party Submissions) and the 29th of June 2023 (Local Authority Reports). The request was made in relation to the live Strategic Infrastructure Development (SID) planning application before them for consideration (ref: ABP-316212) for a proposed wind farm development located at Ballivor Bog Group in Counties Meath and Westmeath. The Board did not request responses to specific submissions made to the planning application; rather they invited the applicant to respond to all observations received to the application.

The letters stated that the deadline for submitting a response to the third-party submissions was the 18th of July 2023 and the 26th of July 2023 for the Local Authority's reports. On July 11, 2023, MKO, representing the Applicant submitted a formal request to An Bord Pleanála for an extension to this deadline. The purpose of the request was to seek an extension until **September 1, 2023**, allowing sufficient time for a thorough response to be prepared in regard to both the Third Party and Local Authorities submissions received. This extension was granted by the Board.

This report sets out the Applicant's thematic responses to the observations received from third parties and a targeted response to the relevant Local Authority Reports, focusing on the recommendations set out in the relevant reports.

It is noted that the planning application lodged included a robust Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS) and a suite of drawings in support of the Proposed Development.

This document comments firstly on observations from third parties which have been categorised in themes, followed by responses to the reports received from Meath and Westmeath County Councils.

1.1

Background to the Proposed Development

The applicant sought planning permission from the Board in April 2023 for the following Proposed Development, set out in the public notices as follows:

The Proposed Development will constitute of the following:

- i. The construction of 26 No. wind turbines and all associated hard-standing areas with the following parameters:
 - a. A total blade tip height of 200m,
 - b. Hub height of 115m, and
 - c. Rotor diameter of 170m.*
- ii. 2 No. permanent Meteorological Anemometry Masts with a height of 115 metres and associated hardstanding area and removal of existing meteorological mast.*
- iii. 4 No. temporary construction compounds with temporary site offices and staff facilities, in the townlands of Bracklin and Grange More.*
- iv. 5 No. temporary security cabins at the main construction site entrances and access points around the site, in the townland of Killagh, Grange More and Coolronan.*
- v. 2 No. borrow pits located in the townlands of Grange More and Craddanstown and all works associated with the opening, gravel and spoil extraction, and decommissioning of the borrow pits.*
- vi. 1 No. permanent 110 kV electrical substation, which will be constructed in the townland of Grange More. The electrical substation will have 2 No. single storey control buildings, a 36-metre-high telecom tower, associated electrical plant and equipment, a groundwater well and a wastewater holding tank.*

- vii. *All associated underground electrical and communications cabling connecting the turbines and masts to the proposed electrical substation, including road crossings at R156 and a local road between Lisclogher and Bracklin Bogs, and all works associated with the connection of the proposed wind farm to the national electricity grid, which will comprise connecting into the existing Mullingar – Corduff 110 kV overhead line that traverses the site.*
- viii. *Provision of new internal site access tracks with passing bays measuring a total length of c. 28km and provision/upgrade of existing/new pathways for amenity uses measuring a total length of c. 3.3km and associated drainage.*
- ix. *Temporary accommodating works to existing public road infrastructure to facilitate delivery of abnormal loads at locations on the R156 and R161 in the townlands of Doolystown and Moyfeagher.*
- x. *Accommodating works to widen existing site entrances off the R156 into Ballivor and Carranstown Bogs and reopen entrances at Lisclogher and Bracklin Bogs for use as construction site entrances and to facilitate delivery and movement of turbine components and construction materials; Entrances will be used for maintenance and amenity access during the operational period.*
- xi. *Permanent vertical realignment of the R156 in the vicinity of the site entrance to achieve required sight lines.*
- xii. *Construction of permanent site entrances off a local road into Lisclogher and Bracklin Bogs to facilitate a crossing point for turbine components, construction materials and operation/amenity access.*
- xiii. *Provision of amenity access and amenity pathways using existing entrances off the R156 and local roads in the townlands of Bracklin, Coolronan, Clondalee More and Craddanstown.*
- xiv. *3 No. permanent amenity car parks in Ballivor Bog (50 no. car parking spaces), Carranstown (15 no. car parking spaces) and Bracklin Bog (15 no. car parking spaces) and the provision of bicycle rack facilities at each location.*
- xv. *All associated site works and ancillary development including access roads, drainage and signage.*
- xvi. *A 10-year planning permission and 30-year operational life of the wind farm from the date of commissioning of the entire wind farm.*

2.

RESPONSE TO OBSERVATIONS:

This section provides a response to the third-party submissions received on the Proposed Development. There were 42 no. submissions received on the application for Proposed Development which have been categorised into themes in the interest of clarity and ease of reference. Table 1 below outlines the main themes identified within the third party submissions and the team/organisation responsible for the response provided.

Theme	Lead Author for Response
Landscape and Visual	MKO LVIA Team
Archaeology & Cultural Heritage	Tobar Archaeology
Ecology/ Biodiversity	MKO Ecology
Ornithology	MKO Ornithology
Hydrology	Hydro Environmental Services
Shadow Flicker	MKO Environment
Property Value	MKO Environment
Human Health	MKO Environment
Carbon Release	MKO Environment
Telecoms and Aviation	MKO Environment
Employment	MKO Environment
Tourism	MKO Environment
Construction and Decommissioning	MKO Environment
Cumulative Assessment	MKO Environment
Scoping	MKO Environment
Consideration of Alternatives	MKO Environment
Roads and Traffic	Alan Lipscombe Traffic Consultants
Noise and Vibration	AWN Consulting
Land Ownership	Bord Na Mona
Community Consultation	Bord Na Mona
Planning	MKO Planning

Table 1. Third Party Submission Themes

2.1.1

Landscape & Visual

This section presents a response to recurring themes pertaining to landscape and visual impacts in the submissions made on the Proposed Development. The responses outlined below address the following recurring themes:

- Selected Photomontage Locations;
- Effects on Residential Visual Amenity;
- Landscape and Visual Effects on Local Heritage Sites in Proximity to the Proposed Development;
- Landscape and Visual Effects on Very High Sensitivity Cultural Heritage Sites

A detailed and comprehensive Landscape and Visual Impact Assessment (Chapter 13) was produced for the proposed Ballivor Wind Farm EIAR (hereafter referred to as the 'EIAR LVIA') which follows best practice methods as part of the assessment process. The LVIA methodology applied for the assessment is comprehensively detailed in Appendix 13-1 of the EIAR – *LVIA Methodology*. This assessment methodology follows the documented methods specified in guidance for LVIA, with most specific focus on the *Guidelines for Landscape and Visual Impact Assessment 3rd edition* (Landscape Institute & IEMA, 2013) also known as (and hereafter referred to as) the GLVIA3. A summary of this methodology is provided in the following section, ahead of the responses to the reoccurring themes raised in the submissions.

Summary of Landscape and Visual Impact Assessment Methodology

The landscape and visual assessment methodology used in the EIAR LVIA (Chapter 13) includes clearly documented methods based on the GLVIA3 guidance. This includes consideration of landscape and visual 'sensitivity' balanced with the 'magnitude of change' to determine the significance of effects. Mitigating factors are then taken into consideration to arrive at residual landscape and visual effects. Residual landscape and visual effects are graded upon an 'impact assessment classification of significance' scale, as defined by the Environmental Protection Agency of Ireland (EPA, 2022)

Assessment of potential impacts in the EIAR LVIA uses verified photomontages, whereby the potential effects arising as a result of the proposed turbines are assessed from viewpoint locations representative of prominent and sensitive receptors located within the LVIA Study Area (an area to 25km from the nearest proposed turbine and extended to 26.1km to account for the Hill of Tara). 19 No. Verified photomontages were produced and are included in the Photomontage Booklet, Appendix 13-4 of the EIAR LVIA. A comprehensive assessment of each photomontage including an assessment of cumulative visual effects is reported in Appendix 13-3 of the EIAR LVIA – *Photomontage Assessment Tables*. Photomontages are useful visualisation tools supporting an LVIA. However, it is worth noting that the overall visual impact assessments included in the EIAR LVIA does not rely entirely on the verified photomontages alone, but also considers information gathered during site visits and visibility appraisals conducted on the ground, as well as other tools such as ZTV mapping, photowires (early-stage photomontage visuals) and a Route Screening Analysis.

The methods and processes used for Landscape and Visual Impact Assessments included in the EIAR LVIA follow a range of standard best practice guidance (with focus on the GLVIA3 as well as the Wind Energy Development Guidelines for Planning Authorities (DoEHLG, 2006) and Draft Revised Wind Energy Development Guidelines, DoHPLG, 2019 – hereafter referred to as the 'WEDGs' and 'Draft WEDGs'). These methods and processes are clearly implemented and laid out in tables in the impact assessment Appendices which form part of the EIAR LVIA, Appendix 13-2 - *LCA Assessment Tables* and, Appendix 13-3 - *Photomontage Assessment Tables*.

The assessments in these impact assessment appendices are guided by definitions (receptor 'Sensitivity' and 'Magnitude of Change') and matrices included in Section 1.5 of Appendix 13-1. Given the naturally subjective nature of the significance determination process, the impact assessment tools (definitions and

tabular matrices) provide a transparent and logical structure to the impact assessment process. The fundamental structure of these impact assessments (Sensitivity x Magnitude of Change = Effect) is clearly laid out in the impact assessment tables included in the appendices and account for cumulative effects with other wind energy developments. However, in alignment with the guidance (see section 3.36, GLVIA3, 2013), the final impact assessment is supported by clear text narrative. In relation to the determination of visual effects using photomontages, the visual impact assessment tables (Appendix 13-3) ensure that the rationale for the overall judgement is clear (see sections 3.28-3.29, GLVIA3, 2013) and that the final residual visual effects consider the sensitivity, magnitude of change, cumulative effects and mitigating factors.

Selected Photomontage Locations

Observations were made in relation to the locations of viewpoints used for the production of photomontages and suggest that other locations could have been included in the EIAR. 19 No. verified photomontages are included in the EIAR Photomontage Booklet – Appendix 13-4. Also, several other early-stage photomontages – termed ‘photowires’ are included in the discussion of visual effects in Section 13.7.3.3 of the EIAR LVIA. The photowires are included in the text of the EIAR LVIA and show the view where photomontage imagery was captured but no visibility of the proposed development occurs due to screening. Therefore, these photowire viewpoints (e.g. The Hill of Ward) were not brought forward for inclusion in the photomontage booklet.

It is important to note that it is not possible to produce photomontages from every receptor (landscape, visual and cultural heritage) in the various study areas defined in Chapter 12 Archaeology and Cultural Heritage and Chapter 13 Landscape and Visual Impact. Furthermore, it would be a disproportionate measure to include an individual photomontage from every receptor and this is not required to conduct a thorough and robust assessment of landscape and visual effects or indirect effects upon setting of heritage assets. In line with the guidance laid out in the GLVIA3 (LI & IEMA, 2013), the viewpoints selected for the LVIA, and cultural heritage assessments conducted were informed by a range of factors including the “ZTV analysis, by fieldwork, and by desk research” (para 6.18, GLVIA 3, 2013). Furthermore, the GLVIA3 states that representative viewpoints are “selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ” (para 6.19 GLVIA 3, 2013).

At all times (in line with best practice guidance), the focus of the EIAR LVIA was to assess impacts on the most sensitive receptors where the greatest likelihood of significant effects will arise. The EIAR LVIA details an extensive search exercise which identifies the **most** sensitive landscape and visual receptors in the LVIA Study Area – See Landscape Baseline (Section 13.5) and Visual Baseline (Section 13.4). Following this exercise, a process is followed to identify appropriate photomontage viewpoints which show a range of different receptors and geographic perspectives. The following text is reported in Section 13.7.3.2.1 EIAR of the LVIA - *Selection of Photomontage Viewpoints*:

“The locations chosen for photomontages follow a detailed and extensive process including review of baseline information, site visits and high-quality photo taking at multiple locations within the LVIA Study Area. Many locations, which based on a desktop review had the potential for views of the proposed turbines, had complete intervening screening or were screened to such an extent that the completion of photomontages was not considered useful in terms of the assessment process i.e., little or no visibility towards the proposed turbines”.

It is also to be noted that many of the submissions propose production of photomontages from viewpoints located within private lands, which in some cases is not possible considering access restrictions.

Effects on Residential Visual Amenity

Several submissions relate to visual effects and adequate set back distances on residences in the surrounding landscape. Section 13.7.3.2.3 of the EIAR LVIA addresses impacts upon local residential visual amenity and reports the following in relation to the recommended set back distances prescribed by the Wind Energy Development Guidelines:

“The Proposed Development design process has been aware of set-back distances, with regard to the siting of turbines in proximity to residential dwellings, the Proposed Development adheres to the recommended 500m set back distance in the Guidelines (DoEHLG, 2006) and also the 4 times tip height set-back distance set out for residential visual amenity prescribed by the draft Guidelines (DOHPLG, 2019).”

Also as stated in Section 13.1.4 of the EIAR LVIA, the final proposed development design was part of an iterative design process. And in relation to the project layout and design the EIAR LVIA states:

“The final design of the Proposed Development and strategic siting of turbines in the landscape was informed by extensive early-stage impact assessment work conducted in 2020 and 2021, including a Residential Visual Amenity Appraisal. The evolution of the turbine layout included omission of turbines from the project and careful micro-siting of turbines aimed at preventing the potential for significant landscape and visual effects....

Initial project layouts included turbines sited within Carranstown bog and Lisclogher West bog. These turbines were omitted from the proposal in order to mitigate the potential for any surrounding visual effects on sensitive receptors as well as ensuring sufficient separation distance between the two distinct turbine clusters.”

As reported in the EIAR LVIA, some significant visual effects will arise from a few residential receptors in very close proximity to the proposed turbines. However, in general, visual effects on residential receptors in the wider landscape setting are of a lesser impact due to the flat nature of the landscape and the disproportionate screening effect provided by mature boundary vegetation. As identified by site visits and verified through production of many photomontages which were not included in the photomontage booklet due to no visibility, the visibility of the proposed turbines becomes very limited beyond distances of 2-3 km in such a flat landscape. In general, receptors will only experience views of a few of the proposed turbines when viewing from locations at similar base elevations as the proposed turbines. This is discussed in detail in Section 13.3.3 - *Factors Influencing Turbine Visibility* and Section 13.3.4 - *Visibility in Close Proximity to the Proposed Development*. All turbines of the Proposed Development (the development as a whole) are only really experienced from very elevated vantage points where open views across the landscape are permitted. Peaks of local hills in the area generally not representative of residential receptors

Landscape and Visual Effects on Local Heritage Sites in Proximity to the Proposed Development

Several submissions address effects on local heritage sites in proximity to the Proposed Development, and potential for indirect effects on their setting. The local heritage sites sites of note include:

- The Hill of Ward
- Tower House at Causetown
- A Barrow at Rathwire Upper.
- Martinstown Castle

Apart from the Hill of Ward, these sites were not assessed in the EIAR LVIA as they do not necessarily represent any particularly sensitive landscape or visual receptors but are addressed in the Archaeology and Cultural Heritage Chapter of the EIAR – Chapter 12. However, in response to the submissions received a discussion on these assets can be found below in relation to the potential landscape and visual impact of the proposed turbines on these receptors.

The Hill of Ward

Observations were made stating a more complete assessment of the ‘main enclosure at the summit of the Hill of Ward’ should have been included in the EIAR LVIA. This recommendation is predominantly based upon the fact that no Photomontage from the Hill (Meath Scenic View 52) was included in the Photomontage Booklet (Appendix 13-4). The Hill of Ward was visited, and photomontage imagery was captured from the panoramic view at the peak of the Hill. A photowire (early-stage photomontage) was produced from this location as shown in Figure 13-23 on Page 13-113 of the EIAR LVIA. As shown in the photowire and can be seen on any map, a dense cluster of woodland is located immediately south-west of the Hill of Ward, providing screening of views between it and the Proposed Development, reducing potential for significant effects upon the protected views. It is granted that slightly more visibility may occur during winter months, however, in general (even in winter months), most of the proposed turbines will be screened from view.

Tower House at Causetown

The tower house structure is located within at the southern extent of a field which is located north of the N51 National Road. The photomontage shown in viewpoint 1 (Photomontage booklet Appendix 13-4 of the EIAR LVIA) is located in close proximity to this location and is set back a similar distance. That photomontage shows the disproportionate screening effect of landscape features such as mature woodland in such a flat landscape, even though this viewpoint (VP1) was chosen where there is relatively open view across a field adjacent to the road. As is reported throughout the EIAR LVIA, long ranging views are not available in very flat landscapes where dense and mature vegetation form field boundaries, which is an accurate description of the landscape immediately surrounding the Proposed Development site.

As shown in Figure 1 below, the Tower House at Causetown is located within an agricultural field comprising grassland pasture. The proposed turbines are located to the south-west as indicated by the blue arrows. The receptors in this area include the N51 to the south, as well as a local road which runs north-south along fields to the west. Several residential receptors are aligned along this road network to the east, south-west and west of the tower. Lands to the north of the tower comprise uninhabited agricultural land.

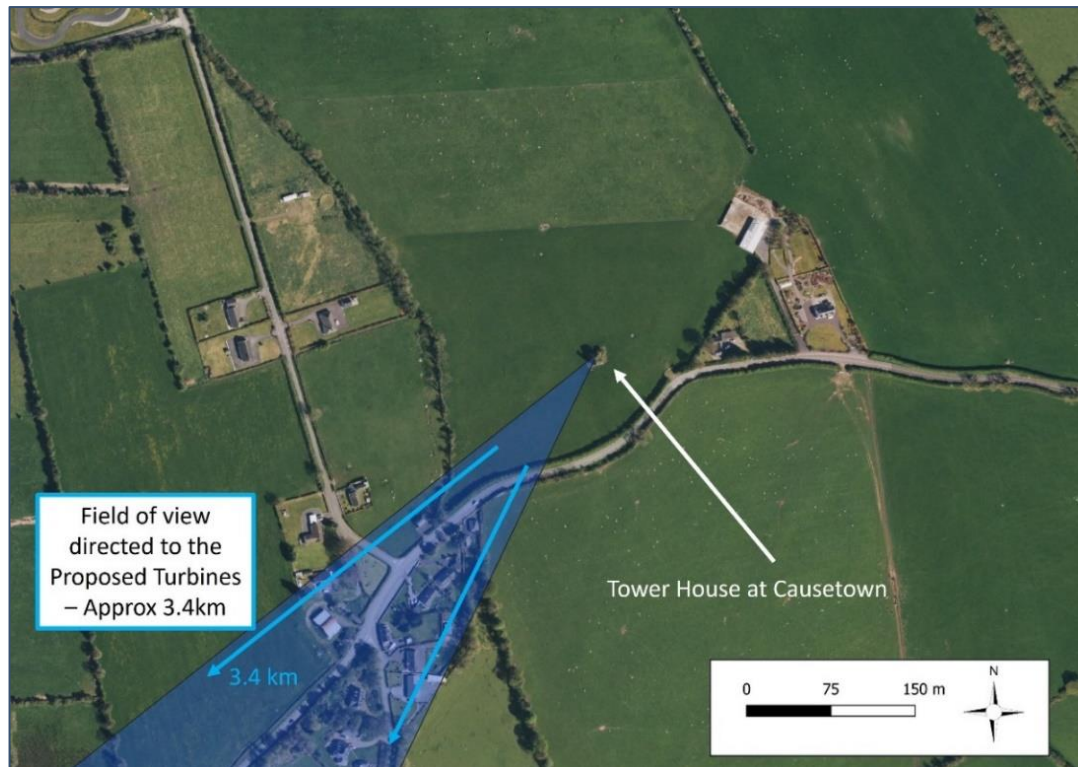


Figure 1. Causetown Tower House Field of View

A desktop investigation of this receptor did not indicate any public access or right of way to the heritage site, and it is not considered to be a destination attracting high visitor numbers. Therefore, from an LVIA perspective, it is not considered a receptor of high sensitivity, and sensitivity is only derived from its value as a local landmark in the landscape. The desktop study and map above also determined that receptors in the area (not within the private lands) can only really view and appreciate the monument and its setting from the south, east or west. Considering the proposed turbines are located to the south-west (3.4km) they will not be viewed in combination with any of the receptors identified (roadside residences). Irrespective of the orientation from receptors, it is unlikely that the proposed turbines will have much visibility in combination with the tower due to the setback distance and dense vegetation screening in the flat landscape.

Barrow at Rathwire Upper

The Barrow at Rathwire Upper is located to the north-west of Killucan, approximately 8km west of the nearest proposed turbine. The landscape in this area of the study area is gently undulating as stated in the EIAR LVIA:

“landform beyond 5km north and west of the proposed turbines becomes a lot more irregular and undulating as the landscape transitions from flat lowlands to the Westmeath Hills. The ZTV map shows that this change in landforms causes a sporadic and intermittent spread of theoretical visibility to the north-west of the LVIA Study Area beyond 10km from the Proposed Development.”

Although the landscape is undulating in this area, in general, at a macro scale, the landscape is still quite flat. In general, long ranging views are not permitted due to screening from boundary vegetation and slight landform undulations, excepting from elevated vantage points. Photomontage imagery was captured from a slightly elevated location on the R156 Regional Road as it exits Killucan to the east. The view is focussed in the direction of the Proposed Development, approximately 2 km east of the monument (2km closer to the proposed turbines). A photowire (early-stage photomontage) was produced from this location here and is presented below in Figure 2. As shown by the photowire, almost all of the proposed turbines will be screened from view completely, therefore this viewpoint was not included in the

photomontage booklet. However, the photowire does illustrate the limited visibility of the proposed turbines that is expected to occur within this area of the landscape.



Figure 2. Barrow at Rathwire Upper Photowire

A desktop investigation of the Barrow monument indicates that it does not represent a high sensitivity receptor from an LVIA perspective for the same reasons reported above for the Tower House at Causetown (e.g., visitor numbers, lack of public access). Considering the setback distance (c.8 km) and setting of the Barrow in a field enclosed by boundary vegetation to the west, it is considered that the Proposed Development is not likely to cause any significant impacts upon the character or appreciation of this receptor and its setting.

Martinstown Castle

Several observations were made pertaining to the omission of Martinstown Castle from the impact assessment. A desktop study identified that like many of the other heritage receptors in close proximity to the site, Martinstown Castle is located within private lands with very limited public access and is not deemed to be a high sensitivity receptor from an LVIA perspective. The castle is located approximately 3.3km from the nearest proposed turbine, however it is located in closer proximity to the permitted Bracklyn wind farm. One permitted Bracklyn turbine is located approximately 1.3km from the castle, and these turbines will therefore have the greatest effects on the setting and character of this monument. Several turbines of the Proposed Development may be visible as well from the landscape and visual receptors in proximity to the castle and will therefore contribute to some cumulative effects with the permitted Bracklyn turbines. A desk study analysis was conducted considering the location of Martinstown castle and the orientation of receptors in relation to the heritage site and the proposed Ballivor turbines. By virtue of its location in relation to receptors and the proposed turbines and vegetation in the landscape, only turbines to the south of the permitted Bracklyn turbines will potentially contribute to cumulative impacts when the castle is viewed from receptors to the north (a road and several residential receptors). Ultimately no significant effects are likely to arise on account of the Proposed Development.

Effects on Other Local Heritage Receptors

Several other local heritage receptors are mentioned within the observations submitted. Many of these are addressed in the Archaeology and Cultural Heritage Chapter of the EIAR – Chapter 12. The visual impact upon several Recorded Protected Structures (including Woodtown House) identified by the planning authority are addressed later in this response document – See Section 3.1.1.

Landscape and Visual Effects on Very High Sensitivity Cultural Heritage Sites

Many of the submissions relate to potential impacts upon Very High sensitivity cultural heritage sites such as the Royal sites of Ireland. The following sites are of particular note:

- The Hill of Tara
- Loughcrew and the Slieve na Calliagh Hills

These sites, their landscapes, and any protected scenic amenity associated with them have been comprehensively assessed in the EIAR LVIA. A comprehensive review and discussion of the potential impacts upon these receptors is presented again in this document in response to recommendations made by the planning authority. Please see Section 3.1.1 of this document for further discussion of landscape and visual effects of the Hill of Tara in response to recommendation 1(b) made by Meath County Council. Also, see Section 3.1.1 of this document in relation to further discussion on the landscape and visual effects from Loughcrew and Slieve na Calliagh Hills in response to recommendation 1(d) made by Meath County Council.

Other high sensitivity receptors identified within the submissions include Brú na Bóinne (37.5 km to nearest proposed turbine), Dún Ailinne (46.6 km to nearest proposed turbine) and the Hill of Uisneach (33.2 km to nearest proposed turbine). Please see Section 3.1.1 of this document for further responses to recommendation 1(c) made by Meath County Council.

Third party observations were made stating that it is unacceptable for turbines to be seen within the landscape from the Hill of Tara and other elevated vantage points of high sensitivity in Co. Meath, even at distances greater than 20km. It is noted that such a principle would eliminate vast areas of the Irish Landscape from the development of wind energy, even locations specifically designated and zoned for this purpose in local planning policy (for example the Proposed Development which is strategically sited in an area of cutover peatland, a landscape where wind energy is directed in the planning policy of Co. Westmeath).

2.1.2 Archaeology & Cultural Heritage

An observation was made by the DAU that three monuments were omitted from the cultural heritage impact assessment for the Proposed Development.

- Tlachtga /Hill of Ward (National Monument No. 150),
- Tower House at Causetown (*Lune By*) (Preservation Order 176/1945); and
- Barrow at Rathwire Upper (Preservation Order No 18/1977).

There is no standardised Irish industry-wide approach in for assessing the degree of impact to the setting of a monument. As stated in Chapter 12 section 12.2.5 of the EIAR, a standardised approach was utilised for the assessment of impacts of visual setting (indirect effects) according to types of monuments and cultural heritage assets which may have varying degrees of sensitivity. The assessment of impacts on visual setting was undertaken using both the Zone of Theoretical Visibility (ZTV) map in the Landscape and Visual Impact Assessment (LVIA), as presented in Chapter 13 of this EIAR, and also viewshed analysis from specific cultural heritage assets.

In the absence of guidance and based on professional judgment, the study area of 10km was used for the viewshed analysis for National Monuments in State Ownership and With Preservation Orders. The viewshed analysis used in the assessment of potential impacts on the visual setting of cultural heritage assets in the wider landscape of 10km considers the effects of the proposed turbines only. As detailed in Chapter 13 LVIA, the tall, vertical nature of the proposed turbines make them the most prominent elements of the Proposed Development from a landscape and visual perspective and have the most potential to give rise to significant landscape and visual effects. Other components of the Proposed Developments are not deemed to be as visually prominent as the proposed turbines. Other lower visibility infrastructure such as roads, substation, met masts etc. are not included in the viewshed analysis but are assessed without the use of viewshed analysis. While direct physical impacts to a site or monument can easily be assessed in quantitative terms, the assessment of impacts on setting can be subjective and as such is a matter of qualitative, professional judgement and experience. Due to the absence of policy on

the assessment of visual impacts on cultural heritage, the distances below used in the assessment of impacts on setting are regarded as appropriate and are based on professional judgement and experience.

Tlachtga/Hill of Ward (National Monument No. 150)

The Hill of Ward (National Monument in State Care No. 150) is located 9.3km from the nearest infrastructure (turbine 24) in Co. Meath and comprises a quadri-vallate enclosure dating to the Late Bronze Age. It should be noted that at the time of write up on the 30th of August, 2023, the National Monuments Service website was down for maintenance. The following¹ is taken from the University of College Dublin website which has taken up archaeological investigations from 2014-2016.

'The Hill of Ward, Co. Meath is located 2km to the east of the medieval town of Athboy, and comprises a gently rising outcrop of 'Calp' limestone and shale with a maximum OD of c. 140m. The hill is topped by a 150m quadrivallate earthen enclosure known by the Irish name of Tlachtga (occasionally Tlachta or Tlachtgha), usually translated as 'earth spear'. In the ancient kingdom of Mide, Tlachtga was considered an important assembly place alongside Tara (Temhair/Temair), Teiltun and Uisneach. These four 'corners' are recorded as having been the location of fortresses constructed by high king Tuathal Techmar (who is described in Fragmentary Annals 116 as 'Tuathal of Tlachtga') at the foundation of Mide in the early decades of the first millennium AD. The 'Three Finds of Emain', Bres, Nár and Lothár, sons of High King Eochaid Feidlech and triplet brothers of Queen Medb of Connacht are said to have dwelt at Tlachtga in the first century AD. Somewhat later, Geoffrey Keating in his 'History of Ireland' records Tlachtga as the centre of Irish Samhain traditions (equivalent to the modern festival of Halloween), noting that on the hill 'the priests, augurs and druids of Ireland [would] assemble upon the eve of All Saints, in order to consume the sacrifices that were offered to their pagan gods' (Keating 1809). This has led to Tlachtga being labelled as 'the birthplace of Halloween'.

The results of the ZTV indicate that all turbines will be visible from the top of the Hill. This is a worst-case scenario and is based on an open bare landscape with no vegetation screening. In reality a person standing on the top of the Hill of Ward looking in the direction of Ballivor Wind Farm will impede visibility of the proposed turbines due to intervening buildings to the west. As demonstrated in the Landscape and Visual Impact Assessment and discussed above in section 2.1.1, the Hill of Ward has partial intervisibility with the Proposed Development and a site visit to the top of the Hill determined that just one turbine is visible (please see EIAR Chapter 13 Figure 13-23 for details). In this regard the impact on its setting is considered Slight-Moderate. When considering the permitted Bracklyn turbines which are located adjacent to the Proposed Development, this impact may increase to Moderate.

Tower House at Causetown (Lune By) (Preservation Order 176/1945)

The Tower House at Causetown is located approx. 3.4km northeast from the nearest infrastructure (turbine 24) in Co. Meath and is a and comprises a late-medieval tower castle in ruins. It should be noted that at the time of write up on the 30th of August, 2023, the National Monuments Service website was down for maintenance. The following is taken from the Ariadne Portal whose source is the Sites and Monuments Record.

'Situated on a fairly level landscape. According to the Civil Survey (1654-6) Cawcestown in Athboy parish was church land owned by the Archbishop of Armagh in 1640, and on the property was 'one castle and some cottages' (Simington 1940, 218). This is a rectangular tower house with rounded NW and SE corners, and circular stairs towers at the NE and SW corners. The doorway on the E side leads into the ground floor chamber (int. dims 5.8m E-W; 4.9m N-S) with an E-W barrel-vault. The only features are double-splay lights in the E and W walls and a passage in the E wall leading to the newel stairs in the NE tower. Only the W wall survives at the first floor with a large window opening, together with the SW tower that has evidence of a newel stairs rising to the second floor, which is corbelled at the top and suggests that it was not any higher. The above description is derived from the published 'Archaeological

¹ <https://www.ucd.ie/archaeology/research/how/>

Inventory of County Meath' (Dublin: Stationery Office, 1987). In certain instances, the entries have been revised and updated in the light of recent research. Compiled by: Michael Moore Date of revision: 28 June 2016 This monument is subject to a preservation order made under the National Monuments Acts 1930 to 2014 (PO no. 176/1945).'

The results of the ZTV indicate that all turbines will be visible from the top of the Hill. This is a worst-case scenario and is based on an open bare landscape with no vegetation screening. In reality a person standing on the top of the Hill of Ward looking in the direction of Ballivor Wind Farm will experience impeded visibility of the proposed turbines due to intervening woodland to the west. As demonstrated in the Landscape and Visual Impact Assessment and discussed above in section 2.1.1, the Hill of Ward has partial intervisibility with the Proposed Development and a wireframe produced from the top of the Hill determined that just one turbine would be visible (please see EIAR Chapter 13 Figure 13-23 for details). In this regard the impact on its setting is considered Slight-Moderate. When considering the permitted Bracklyn turbines which are located adjacent to the Proposed Development, this impact may increase to Moderate.

Barrow at Rathwire Upper (Preservation Order No 18/1977).

The Barrow at Rathwire Upper is an unclassified, low lying, damaged mound located 8km west of T10 in Co. Westmeath. It should be noted that at the time of write up on the 30th of August, 2023, the National Monuments Service website was down for maintenance. It is described on the Ariadne Portal whose source is the Sites and Monuments Record as:

'Markedly tear-drop-shaped or eye-shaped earthwork (Diam. (overall) 24.6m N-S x 31.7m E-W), broader at W end than E, comprising a large basal mound with gently domed upper surface (Diam. 18.4m N-S x 26m E-W) and delimited by a steep scarp on all sides; on top of this is a low mound, eccentrically positioned 15.2m from broad W end of basal mound but only 6.5m from narrow E end. This upper mound is irregular shaped but roughly circular (Diam. 3.9m N-S x 3.8m E-W), and rises only 0.5m above basal mound where highest on S side. Height of scarp defining basal mound is up to 1.2m on N and S sides; and absolute height of monument, from upper surface of upper mound to ground level, is 2m at SE. Various kerb-like boulders protrude from edges of scarp, with several visible on N and S sides; but these are found at differing heights, and, as one ASI fieldworker observed on 27/7/72, 'there is no clearly visible indications that they are formally set' [SMR file]. Chunks have been removed from edge of mound in various places, especially at NNE but also at SE, the result of cattle erosion or small-scale quarrying; but overall the monument is well preserved. Faint traces of a bank observed by an ASI fieldworker on 10/4/70 were in the disturbed NNE area and, as such, were 'probably not original' [SMR file]. Barrow is sited on a local eminence from which it has at least in part been shaped, given that there is no ditch to account for the massive basal mound. The complex, prominently positioned barrow at Rathwire Upper (WM020-123—) is visible uphill to N, on S slope of hill that is capped by a ring-barrow in an unusual rectilinear enclosure (WM020-087—). Lower down again, a couple of hundred metres to S of present barrow, are two branches of the E-W flowing Riverstown River, a tributary of the Deel'. Compiled by: Caimin O'Brien based on details provided by David McGuinness. Date of upload: 10 February 2016'

The barrow is located in the middle of an agricultural field, on private property and therefore cannot be accessed. The results of the ZTV indicate that 14-20 turbines would be visible from the barrow field. However, this is a worst-case scenario based on an open bare landscape with no vegetation screening. In reality, the separation distance between the wind farm and the low-lying monument, the screening from intervening vegetation and the town of Killucan will impede the views towards the Proposed Development. Furthermore, the photowire (Figure 2) included above indicates that almost all of the proposed turbines will be screened. In this regard, the impact on the setting of the ruined monument is predicted to be slight.

Cumulative Impact

Indirect impacts on setting occur at the operational stage of the development (when turbines are operational). In this regard in order to assess overall cumulative effects on archaeology and cultural

heritage, the proposed project is considered in the context of other physical developments, in particular other permitted and proposed wind farms as shown in above. While The Hill of Ward, Tower House at Causetown Castle and the Barrow at Rathwire Upper were not specifically addressed in the Archaeology and Cultural Heritage Chapter, the cumulative effects viewshed analysis included on Figure 12-23 does take into account the location of these assets. The viewshed indicates that theoretically, the upper portions of both the permitted Bracklyn and proposed Ballivor turbines may be visible from all three assets. The effect on setting is categorised as Slight/Moderate when both wind farms are considered. However, this is a worst-case scenario since the model does not take natural screening into consideration. As the proposed Knockanarragh wind farm is located over 6km to the north of the Proposed Development and the permitted Bracklyn wind farm and over 10km northwest of the Hill of Ward, over 14.6km north of the Barrow and 6km northwest of the Tower House at Causetown, it is considered that the cumulative impact on their setting would remain the same giving the separation distance of the three monuments and from the permitted and proposed wind farms. Likewise, it is considered that the cumulative impact would remain Slight/Moderate when solar farms are considered given the lack of any solar developments, permitted or proposed within 5km and their low-lying nature.

Archaeological Testing Requirements

The DAU recommends pre- construction archaeological testing. Chapter 12 of the EIAR for the Proposed Development includes a detailed and comprehensive Archaeology and Cultural Heritage Impact Assessment. As part of the assessment, archaeological monitoring of over 98 trial pits under excavation licence 20E0224 was undertaken at the Proposed Development Site for which reports were produced and submitted to the National Monuments Service. Nothing of archaeological note was discovered in any trial pit. The stratigraphy noted within the trial pits varied throughout the site but typically consisted of an upper layer of loose, soft rooty peat or milled peat overlying layers of fibrous peat. The underlying natural subsoil comprised a grey / blue silt or gravelly silt. In some areas only shallow peat cover was apparent where the pits were located on esker gravel ridges.

Partial human remains (Clonycavan Man) consisting of a torso, head and upper arms were recovered at Bord na Móna's Ballivor Works on 21st February 2003. As Ballivor Bog produced moss peat, the peat was collected and screened to ensure no foreign objects are within it. The human remains were discovered during screening and Bord na Móna were able to identify the location of the stockpile that was being screened. This was in the townland of Clonycavan approximately 1.5km southeast of the Bord na Móna offices at Ballivor Works. The area was inspected and systematically walked by the author (then of ADS Ltd) and Ann Lynch of the DOEHLG (now DoHLGH) during a field visit on the 28th of February 2003. On the 12th of August 2003 a team of one supervisor, one site assistant and two archaeologists under the direction of Eoin Corcoran, ADS Ltd (Licence Ref.: 03E1221) investigated the find spot by shovel scraping, sweeping and trowelling a 100m long area. No further remains were recovered. In addition to this work, the Ballivor Bog Group was one of 15 bogs selected for archaeological survey in 2005 as part of the Archaeological Survey of Ireland Peatland Survey. The bog was field walked by ADS Ltd at two drain intervals with the exception of the cutaway part of Ballivor, which was walked at roughly 30m intervals. No archaeological features were recorded during this survey.

While no archaeological monuments were recorded during the 2005 Peatland Survey or during the walkover survey associated with extensive site investigative works undertaken under licence for the Proposed Development, assessment, mitigation measures proposed for the construction phase are as follows:

- Archaeological monitoring (under licence from the National Monuments Service) of any further geotechnical / engineering trial pits or investigations and a report detailing the results of same.
- Archaeological monitoring of ground works during construction. This includes archaeological monitoring under licence of turbine bases, hardstands, roads, cable trenches, amenity car park, amenity trails, construction compounds, substation site, grid connection loop-ins, angle towers, borrow pits, security cabins and gates, drainage, junction accommodation areas along the haul route and any other peat extraction activities.

- If archaeological finds, features or deposits are uncovered during archaeological monitoring, the developer will be prepared to provide resources for the resolution of such features whether by preservation by record (excavation) or preservation in situ (avoidance). Once the project is completed, a report on the results of the monitoring will be compiled and submitted to the relevant authorities. The National Monuments Service will be informed of such findings and either preservation in situ (avoidance) or preservation by record (archaeological excavation) will be required.
- The floating of roads, where possible (if engineering allows). This would reduce the amount of peat extraction significantly and therefore also reduce potential negative effects on sub-surface archaeology, if present.

It is considered that the lack of archaeological finds during the 2005 surveys combined with the continuous industrial removal of peat at the site until June 2020, the extensive testing undertaken as part of the Proposed Development investigate works, and the small percentage the proposed development footprint carries overall (less than 2% of the site), the above mitigation measures in the form of archaeological monitoring under licence during construction, rather than before construction, is appropriate for the Proposed Development site.

2.1.3 Ecology/Biodiversity

2.1.3.1 DAU Submission

2.1.3.1.1 Oak ash hazel woodland habitat

An observation from the Development Applications Unit (DAU) was made regarding the loss of 0.26 ha of Oak-ash-hazel woodland as a result of the proposed development. It states that loss of this woodland would be significant as this habitat is rare in a local context.

The impact assessment in the Biodiversity chapter submitted as part of the application characterised the loss of 0.26 ha of this habitat as a permanent and irreversible impact on this habitat and it was assessed as a habitat of Local Importance (Higher Value) as it does not conform to any Annex I habitat. As this habitat is not widespread in the local environment, the magnitude of this loss was assessed, in the absence of mitigation, as a significant negative effect on this habitat at the local scale.

The impact assessment further highlights that a Habitat Management and Enhancement Plan (Appendix 6-5 of the EIAR) has been provided and provides for the planting of 1.5 ha of Oak-ash-hazel woodland at the southern end of Bracklin Bog.

Following the implementation of the Habitat Management and Enhancement Plan, there will be no permanent significant effect on this habitat. Whilst there may be a short-term negative impact during the implementation of the Habitat Management and Enhancement Plan, the proposed development will result in an overall long-term positive effect on Oak-ash-hazel woodland habitat within the study area by increasing its area by 1.24 ha.

2.1.3.1.2 Badger

The DAU further noted that the presence of two badger setts was low for the proposed development site and recommended that further surveys be carried out in advance of any works.

Areas identified as providing potential habitat for badger were subject to specialist targeted survey. Dedicated badger surveys were conducted on the 26th and 27th May 2021 and the 8th and 15th July 2021. The badger surveys covered the entire development footprint and surrounding suitable habitats in the

application site. The badger survey was not constrained by vegetation given the nature of the habitats within the site (NRA 2006a). As outlined in the EIAR, only two badger setts were found.

The badger surveys were conducted in order to determine the presence or absence of badger signs within and in close proximity to the development footprint. This involved a search for all potential badger signs as per NRA (2009) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in NRA (2009) (i.e. main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (NRA, 2009) and followed the ‘Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes’ (NRA, 2006a) and CIEEM best practice competencies for species surveys (CIEEM, 2013).

As per Table 6-16 of the Biodiversity Chapter of the EIAR submitted as part of the application, a pre-construction badger survey of the proposed development footprint and adjacent areas will be undertaken and will include the location of the identified setts at Carranstown Bog. This will be undertaken by a qualified ecologist prior to the commencement of any works to determine if the setts are in use and to identify any additional setts or sett entrances that may have been excavated in the intervening period.

Additionally, the Chapter provides for the monitoring of an outlier sett identified within the footprint of the proposed substation at Carranstown Bog. The sett will be monitored by camera traps for 2 weeks prior to any works. If the outlier sett in the construction footprint is found to be in use, exclusion measures will be put in place prior to construction in line with NRA Guidelines to ensure that the sett is evacuated.

As per NRA guidelines, exclusion from an active sett will only be carried out during the period of July to November inclusive in order to avoid the badger breeding season.

During the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts or pile driving within 150m of active setts. If such works are required, exclusion measures will be put in place (as outlined above) prior to construction in line with NRA Guidelines to ensure that the sett is evacuated.

Exclusion zone fencing and appropriate signage will be put in place around the main sett to the south of the substation which lies outside the construction footprint. This will ensure that there will be no vehicles tracking in the area and no temporary storage of construction materials that could impact the sett.

2.1.3.2 General Submissions

2.1.3.2.1 Impact on Biodiversity

Several observations were submitted stating that biodiversity within the proposed development was not fully assessed, the impact assessment carried out was not adequate, and that the proposed development would have adverse impacts on biodiversity.

The impact assessment undertaken for the proposed development was carried out as per the following guidance:

- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018);
- NRA Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009);
- EPA Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (EPA 2022);

Extensive desk studies and field surveys of the proposed development site were undertaken to inform the impact assessment undertaken in the submitted Biodiversity chapter throughout 2020, 2021, and 2022. Full methodologies of the surveys carried out are provided in Section 6.4.3 of Biodiversity chapter, each of which followed the appropriate and relevant guidance. The surveys undertaken included the following:

- Multi-disciplinary Walkover Surveys;
- Dedicated Habitat and Vegetation Composition Surveys;
- Terrestrial Fauna Surveys (badger, otter, marsh fritillary, bats);
- Aquatic surveys;
- Invasive species surveys.

In addition to the above, as per Section 2.5 of the EIAR, an EIA scoping exercise was undertaken as part of the EIA prepared for the planning application. In terms of the biodiversity, the following bodies were contacted to ensure that all aspects of biodiversity within the proposed development site were addressed and considered:

- Bat Conservation Ireland
- BirdWatch Ireland
- Butterfly Conservation Ireland
- Department of Agriculture, Food and the Marine
- Environmental Protection Agency
- Inland Fisheries Ireland
- Irish Peatland Conservation Council
- Irish Red Grouse Association
- Irish Raptor Study Group
- Irish Wildlife Trust
- Waterways Ireland
- Westmeath County Council - Planning Department/ Environment Department/ Roads Department/ Heritage Officer
- Meath County Council - Planning Department/ Environment Department/ Roads Department/ Heritage Officer
- Development Applications Unit of the Department of Housing, Local Government and Heritage (DAU) (includes National Parks & Wildlife Service, and National Monuments Service)

Where responses were received, these were considered in the survey efforts and the impact assessment within the Biodiversity chapter.

Taking into account the above desktop studies, consultation, and field surveys, a detailed and comprehensive Ecological Impact Assessment was carried out on all identified Key Ecological Receptors (KERs) and is provided in Section 6.7 of the submitted EIAR Biodiversity chapter. This impact assessment considered all stages of the proposed development (construction, operational, and decommissioning) and where potential for significant impacts was identified, robust and precautionary mitigations have been provided.

In addition, the proposed development was assessed cumulatively with other projects in wider environs. All projects considered in this assessment are provided in Section 2.4 and Appendix 2-4 of the submitted EIAR and included the following:

- All previous planning applications within the boundary of the proposed development;
- Windfarms within 25km of the application site;
- Residential, Commercial and Agricultural Developments identified in the cumulative search area within 1.7 km from the subject site.
- Approved Forestry Licences in the vicinity of the subject site available from the Department of Agriculture, Forestry and the Marine.

Taking cognisance of the above, the Biodiversity chapter concludes:

- *Following consideration of the residual effects (post mitigation) it is concluded that the Proposed Development will not result in any significant effects on any of the identified KERs. No significant effects on receptors of International, National or County Importance were identified.*
- *The potential for effects on the European Designated Sites are fully described in the Appropriate Assessment Screening report and Natura Impact Statement that accompanies this application. The NIS concludes that in view of best scientific knowledge and on the basis of objective information, the Proposed Development either individually or in combination with other plans or projects, is not likely to have significant effects on the European Sites that were assessed as part Appropriate Assessment process. Following the implementation of mitigation, no potential for significant effects on Nationally designated sites downstream, of the site were identified.*
- *Provided that the Proposed Development is constructed and operated in accordance with the design, best practice and mitigation measures that are described within this application, significant individual or cumulative effects on ecology are not anticipated at the international, national or county scales or on any of the identified KERs.*

2.1.3.2.2 **Impact on Bats**

Concern was raised by several non-statutory consultees as to the potential impacts of the proposed development to bats in the local area. The Bat Survey report that accompanies the EIAR (Appendix 6.2) details the extensive bat surveys carried out in 2020 and 2022 within the proposed development site, which included the following:

- Desk Study
- Consultation with NPWS
- Bat habitat suitability appraisal surveys
- Roost surveys
- Manual transect surveys
- Ground level static surveys
- Static Surveys at height

The surveys and assessment provided in the bat survey report has been designed in accordance with NatureScot 2021. Consideration was also given to the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance, which was produced in August 2021 (amended May 2022).

Surveys carried out in 2022, which were in accordance with NatureScot, 2021, form the core dataset for the assessment of effects on bats. 2022 results are supplemented by data collected during surveys undertaken on the Site in 2020 and designed in accordance with SNH, 2019 Guidelines.

Suitability of the proposed development site to support bats was assessed according to Collins (2016) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low* and *Negligible*, and are described fully in Appendix 1 of the bat survey report in Appendix 6-2.

Details of the findings of the above survey effort are given in the Bat Survey report provided in Appendix 6-2 of the submitted EIAR.

The Bat Report, as well as Sections 6.7.3.2.3 and 6.7.4.2.1 of the submitted EIAR, provides a detailed impact assessment on potential impacts to bats during all phases of the proposed development, and as per NatureScot (2021) Guidance, assesses the following four potential risks to bats:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to, roosts and
- Displacement of individuals or populations.

The construction phase impact assessment concluded that following the implementation of mitigation and best practice measures at the site:

There is no potential for the construction of the Proposed Development to result in Significant effects on the local bat population at any geographic scale, given the small area of suitable habitat to be lost relative to the area of suitable habitat in the wider landscape and given the standard best practice measures outlined above which will be implemented during construction.

Following the implementation of mitigation and best practice measures at the site, the operational phase impact assessment concludes as follows:

Taking into consideration the sensitive design of the project, and the proposed best practice and adaptive mitigation measures outlined above significant residual effects on bats with regard to collision mortality are not anticipated.

2.1.3.2.3 **Impact on Marsh fritillary**

Several submissions were received with regard to potential impacts to marsh fritillary, including one from DRB Community CLG which included a Lepidoptera report undertaken by Jesmond Harding. This report included results of surveys carried out in May 2023 during the adult marsh fritillary flight period and concluded with four main concerns regards the assessment of this species:

- Concerns over Section 6.6.2.1.6 of the EIAR which states the timing of marsh fritillary surveys carried out in 2020;
- Concerns over Section 6.6.2.1.6 of the EIAR which states that no suitable marsh fritillary habitat was identified within the construction footprint of the proposed development;
- Based on the identification of a breeding site within the construction footprint, as per the report provided in the submission, the decision not to include marsh fritillary as a Key Ecological Receptor (KER) should be reviewed.
- Highlights that rewetting of cutover bog within the Ballivor group would be beneficial to the metapopulations of marsh fritillary in the wider environment.

Based on the above concerns, the report advises that marsh fritillary are included as a Key Ecological Receptor (KER) and an impact assessment should be undertaken. The points below address each of these concerns and in doing so, address all other submissions relating to marsh fritillary.

Timing of marsh fritillary surveys

Section 6.6.2.1.6 of the EIAR states that adult marsh fritillary were identified during the multi-disciplinary walkover survey of the proposed development site in April 2020. The Lepidoptera report included in the submission highlights that adults are unlikely to be seen at this time year. In response, it can be confirmed that the above date was recorded in error, and this text should have noted that adult marsh fritillary were identified during the multi-disciplinary walkover survey carried out on the 26th May 2020.

Suitable marsh fritillary habitat within the construction footprint of the proposed development

The proposed development has been designed to avoid areas identified as potential significant habitat for marsh fritillary, which were recorded during surveys in 2020. No areas identified as providing suitable habitat for this species are located within the proposed development footprint.

The Lepidoptera report provided by DRB Community CLG details results from four locations within the proposed development site boundary which were surveyed in May 2023. Concern was raised as this report identified a marsh fritillary breeding site (Site 1 of the report) to be within the footprint of the proposed development. However, as indicated in Figure 3-1 in the Marsh Fritillary survey document provided in Appendix 1 of this submission response, none of the sites surveyed in the report are within the footprint of the proposed development.

However, taking into consideration the findings of the Lepidoptera report, including the identification of marsh fritillary breeding sites in close proximity to the footprint of the proposed development, additional surveys were undertaken on a precautionary basis on the 22nd of August 2023, to ground truth previous surveys carried on the site in 2020, 2021, and 2022, and following on from the surveys undertaken by a third party in 2023. The findings of these additional surveys are provided in the Marsh Fritillary survey document in Appendix 1.

The inclusion of marsh fritillary as a KER

Considering the findings and recommendations of the DRB Community CLG Lepidoptera report, as well as the results of the 2023 surveys, marsh fritillary have been included as a KER in response to the concerns raised in the submissions and an impact assessment has been undertaken in the Marsh Fritillary survey document included as Appendix 1 of this response.

Opportunity for habitat enhancement for bog dependent species through rewetting of drained bog

The Lepidoptera report provided in the submission from DRB Community CLG also outlined the importance of bog habitats for bog dependant species and that there is an opportunity for habitat enhancement throughout the Ballivor bog group as opposed to the construction of a wind farm.

It is important to note that the footprint of the Proposed Development only accounts for a very small percentage of the development site, amounting to no more than 2% of the land area. The footprint of the proposed development has been designed to avoid the most sensitive peatland habitats within the development site, particularly the larger areas of uncut remnant raised bog. While the vast majority of the turbine infrastructure has been located on degraded cutover bog habitats, approximately 1.03 ha of uncut but highly degraded raised bog (PB1) will be lost to facilitate the proposed development. This represents approximately 0.3% of the overall area of this habitat within the proposed development site.

The Habitat Management and Enhancement Plan (HMEP) provided as Appendix 6-5 to the submitted EIAR allows for the rewetting of 12 ha identified for peatland enhancement located at the northern extent of Bracklin Bog, within the development site. This is indicated in Figure 1-1a of the HMEP. Considering the provisions of the HMEP and the very small impact on habitat as a result of the proposed development footprint, the proposed development will have an overall positive impact on the wider bog, and as such, an overall positive impact on marsh fritillary and other lepidoptera species.

Additionally, implementation of the Management Plan provided in the Marsh Fritillary survey document in Appendix 1 of this response provides for the operational phase management of areas identified as suitable habitat for this species, which includes:

- Marsh fritillary and its habitat will continue to be monitored post construction. Some minor management or scrub clearance may be required if it encroaches/establishes along the

- infrastructure corridor. If required, future habitat management measures will be undertaken under the supervision of a suitably qualified ecologist.
- Bord na Móna will work with and support local stakeholders to enhance the education and amenity potential of the site by erecting signage to increase awareness of local biodiversity, and in relation to supporting the monitoring of biodiversity on site.

2.1.3.2.4 **Pollution into the environment**

Concerns were raised by non-statutory consultees over the potential of pollutants, such as concrete and hydrocarbons, entering the environment and impacting on watercourses and bog habitats. As stated in Section 6.7.3.1.1 of the Biodiversity chapter of the submitted EIAR, potential pathways for significant impacts arising from the runoff of pollutants into the environment have been robustly blocked with the implementation of an environmental management framework during the construction phase of the Proposed Development. This includes comprehensive detail regarding site set up, pollution prevention and hydrocarbon management and incorporates mitigating measures as detailed in Chapter 9 'Hydrology' and in the CEMP in Appendix 4-3 of the submitted EIAR to ensure that there is no significant effect on water quality or aquatic receptors within or downstream of the Proposed Development.

Regards the operational phase of the Proposed Development, whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the site has been fully mitigated through appropriate drainage design and mitigation as fully described in Chapter 9 'Hydrology' of the submitted EIAR.

2.1.3.2.5 **Salmon movement**

Concerns were raised by non-statutory consultees over potential impacts on salmon migration and breeding habitat. As stated in Section 6.7.4.2 of the Biodiversity chapter of the submitted EIAR, the footprint of the Proposed Development has been specifically designed to avoid the main watercourses within the Proposed Development Site, with a 50m buffer between the main wind farm infrastructure and any natural watercourses (with the exception of upgrades to existing watercourse crossings and existing site access tracks). Therefore, there is no potential for the Proposed Development to result in barriers to the movement of salmon, or indeed, any other aquatic species.

Additionally, as already highlighted in Section 2.1.3.6 of this response document, all potential pathways for the runoff or leaching of pollutants into watercourses have been robustly blocked with the implementation of an environmental management framework during the construction phase of the Proposed Development.

2.1.3.2.6 **Restoration of bog habitats**

It was claimed that the Proposed Development goes against any attempts towards restoring bog habitat within the Ballivor bog group. The footprint of the Proposed Development only accounts for a very small percentage of the development site, amounting to no more than 2% of the land area. The footprint of the Proposed Development has been designed to avoid the most sensitive peatland habitats within the development site, particularly the larger areas of uncut remnant raised bog. While the vast majority of the turbine infrastructure has been located on degraded cutover bog habitats, approximately 1.03 ha of uncut but highly degraded raised bog (PB1) will be lost to facilitate the proposed development. This represents approximately 0.3% of the overall area of this habitat within the proposed development site.

The Habitat Management and Enhancement Plan (HMEP) provided as Appendix 6-5 to the submitted EIAR allows for the rewetting of 12 ha identified for peatland enhancement located at the northern extent of Bracklin Bog, within the development site. This is indicated in Figure 1-1a of the HMEP. Considering the provisions of HMEP and the very small impact on habitat as a result of the construction footprint, the proposed development will have an overall positive impact on the wider bog.

2.1.3.2.7 Natura Impact Statement

Submissions were received concerning the process of the Appropriate Assessment Screening. It was suggested that further European Sites, in addition to the River Boyne and River Blackwater Special Area of Conservation (SAC) and River Boyne and River Blackwater Special Protection Area (SPA) should be screened in.

The screening process, as detailed in Section 3.1 of the submitted Appropriate Assessment Screening Report (AASR), considered all European Sites on a source pathway receptor model. Where the above sites were screened in based on the presence of a complete source- pathway- receptor chain, all other sites were screened out based on the absence of connectivity, the attenuation properties of the intervening watercourses, the terrestrial nature of QIs/SCIs, and the absence of supporting habitat within the Proposed Development site. No potential for the proposed development to result in likely significant effects on any European Sites, except the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, was identified, either when considered alone or in combination with other plans and projects.

NIS Additional Submission

A submission was received that related primarily to the level of drainage design described in the NIS and the mitigation measures described. Each individual point raised is addressed below.

1. **The section on 3.2.3.1 (of the NIS) drainage design principles shows that the design has not been carried out.**

Response

It is noted that section 3.2.3.1 of the submitted NIS is a subsection of Section 3.2 'Characteristics of the Proposed Development' and clearly states that the drainage design for the proposed wind farm is provided in EIAR Chapter 9 'Hydrology', which is included as Appendix 2 to the NIS. The design principles that are set out in Section 3.2.3.1 simply set out the principles that informed the detailed design that is provided in EIAR Chapter 9 (Appended to the NIS), the Construction and Environmental Management Plan (Appended to the NIS) and the detailed drainage drawings that are provided in Appendix 4.1a to the submitted EIAR. The drainage design as set out in the aforementioned documents provides as much detail as possible at this stage and sets out procedures that allow the requisite flexibility to ensure that the design measures are effective in the face of unforeseen circumstances during construction. It relies on tried and tested methods that follow all relevant guidelines and have been proven to be effective in previous applications. The design and associated monitoring regime ensures that there are no lacunae that would allow the proposed development to result in adverse effect on any European Sites as a result of hydrological change or water pollution.

2. **States that IFI (2016) is a general guideline and not a mitigation measure for a SAC.**

Where the proposed underground cabling route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road. As a further precaution, works in proximity to watercourses will adhere to IFI (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters.

Response

It is noted that the reference to 'IFI (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters' within the NIS in Sections 3.2.3.1 and 5.2.1.4.1 is provided within and following the list of all other mitigation that will be employed to ensure that there are no adverse effects on watercourses. The other measures listed are more than adequate to ensure that the mitigation is effective and the reference to the guidelines is a statement of fact, that the guidelines will be followed.

3. **There is no detailed designs of these mitigation measures.**

During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase

Response

Detailed design for silt fence construction is provided in the drainage design drawings that are located in Appendix 4.1a of the EIAR as submitted. In addition, detail on the design of silt fence construction is also referenced in Section 4.6.4.6 of the EIAR, which reads as follows:

Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream. Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading.

The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects' published by CIRIA (No. C648, 1996).

Silt fence material will comprise Terrastop™ Premium material, and silt fences will be installed as per the manufacturer's guidelines. Silt fences will be inspected on a regular basis to ensure that they are operating effectively.

4. In the vicinity of the crossing is not defined, therefore, it is not definitive.

There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas.

Response

Whilst no distance from the crossing is defined in the EIAR, NIS or supporting documentation, it can be confirmed in this document that no batching or storage of cement will be permitted within 50m of any watercourse crossing.

5. That is not mitigation. The OPW appear to think that they are exempt from Natura 2000

➤ *All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945)*

Response

It is noted that the river/stream crossings will require section 50 consent under the Arterial Drainage Act and this is not mitigation in the context of Appropriate Assessment.

6. Conclusive proof that they have not been designed

➤ *The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.*

Response

The watercourse crossings have been designed in line with the mitigation that is clearly set out in the NIS, EIAR Chapter 9 (Appended to the NIS) and the Construction and Environmental Management Plan (Appended to the NIS). This is designed to ensure that the proposed watercourse crossings do not have the potential to result in adverse effects on the hydrological regime or water quality at the wind farm site. This ensures that they will meet the requirements of the OPW guidelines/requirements for a Section 50 consent, whilst still adhering to all necessary mitigation, which is described in full in the EIAR documentation.

7. As a mitigation measure that is meaningless

➤ *All of the above works will be supervised by an Environmental Clerk of Works and the project hydrologist.*

Response

Whilst not a mitigation measure in and of itself, the requirement for all works to be overseen by an Environmental Clerk of Works is a mechanism for monitoring and ensuring the correct and efficient application of the prescribed work practices and mitigation that are set out in the EIAR, NIS and related documents. The supervisory roles and responsibilities are set out throughout the EIAR documentation and summarised/consolidated in Section 5 of the CEMP.

8. That is not permitted see *Humphries J. In Sweetman v An Bord Pleanala*

5.2.1.4 Mitigation to Avoid Impacts on Water Quality

The pathways that would allow potential impacts to occur due to deterioration of water quality were considered in the design of the proposed development. The environmental management framework to be adhered to during the construction phase of the Proposed Development includes comprehensive detail regarding site setup, pollution prevention and hydrocarbon management and incorporates mitigating measures as detailed in Chapter 9 'Hydrology' of the EIAR and in the CEMP for the Proposed Development which are attached here as Appendix 2 and 3 to ensure that there are no adverse effects on the integrity of any European Sites in light of their conservation objective during the construction, operational or decommissioning phases of the proposed development.

Response

The text provided above is the introduction to the section of the NIS (Section 5.2.1.4) where the prescribed mitigation measures to avoid impacts on water quality are summarised. Full details of these mitigation measures are provided in Chapter 4 of the submitted EIAR, Appendix 4.1a to the EIAR, Chapter 9 of the EIAR (appended to the NIS) and the CEMP (appended to the NIS). As such, there is no lack of detail in respect of what is proposed. There are no lacunae or ambiguity in the measures prescribed, how they will work or how they will be implemented and monitored. As such, it is fully compliant with the above cited legislation and all other relevant caselaw.

9. Proof that a site drainage and maintenance plan does not exist.

➤ *The Project Hydrologist/Design Engineer will complete a site drainage and maintenance plan before construction commences and will attend the site to set out and assist with micro-siting of proposed drainage controls as outlined in Chapter 4 of the EIAR which accompanies the planning application. The drainage system will be excavated and constructed in conjunction with the road and hardstanding construction. Drains will be excavated, and stilling ponds constructed to eliminate any suspended solids within surface water running off the site.*

Response

The drainage design and all necessary measures for the protection of water quality and hydrology on the site have been fully described in the planning application and associated EIAR. The plan that is referred to here is simply the next step in the implementation of the process. This step ensures that the drainage design measures that are set out in the EIAR, CEMP and NIS are effectively and correctly implemented, and this is overseen by the designers of the drainage proposals along with the design and construction engineers. It is an invaluable step in ensuring faithful and correct implementation of the intended and prescribed measures and relies on close collaboration between the hydrologist and the wider project team.

The submitted NIS provides detail on the drainage design principles to be incorporated in the project design of the Proposed Development, as well as additional mitigations for water crossings. These principles and mitigations are a proven set of standards. In addition, the NIS provides for all works pertinent to potential impacts on European Sites to be supervised by an Environmental Clerk of Works and the project hydrologist, ensuring that all works are undertaken as per the NIS, as well as providing ad-hoc mitigations where the need may arise.

10. The concluding points of the submission suggest that there are no mitigation measures in the NIS and related documentation and that therefore, there are lacunae and can be no clear precise and definitive findings. On that basis, it is contended that that the Natura Impact Statement does not comply with the decisions of the Courts of Justice of the European Union.

Response

The submitted NIS has been prepared in compliance with Part XAB of the Planning and Development Acts 2000 (as amended), the Planning and Development Regulation 2001 - 2019 and relevant jurisprudence of the European and Irish Courts. It was also prepared in accordance with all relevant guidance including the European Commission's Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021), *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (EC, 2018), the Department of the Environment's *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (December 2009, amended 11 February 2010).

Where potential pathways for significant impact on European Sites were identified, robust and comprehensive design and mitigation have been provided in Sections 3.2.3.1 and 5.2.1.4.1. of the NIS and in its associate appendices. With the implementation of these principles and mitigations, the client and MKO stand over the conclusion of the NIS, which reads as follows:

'Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation and decommissioning of the Proposed Development will not have an adverse effect on the integrity of any European sites in light of their conservation objectives.'

'Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the Proposed Development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.'

2.1.4 Ornithology

This section of the response to submissions relates solely to ornithology and herein sets out the response to the matters raised. The concerns outlined by the Development Application Unit and other relevant submissions are addressed by topic below. The response to these issues has been prepared by the MKO Ornithology team who undertook the bird surveys and wrote the Ornithology Sections of the EIAR. This response has been prepared by Principal Ornithologist, Padraig Cregg (BSc., MSc.), and Patrick Manley (B.Sc.), Senior Ornithologist of MKO. Both of whom are suitably qualified, competent, professional ornithologists with extensive experience in completing avifaunal assessments and are competent experts for the purposes of the preparation of this EIAR and this response.

Survey Approach

Additional Survey Data

Since lodging the Ballivor Wind Farm planning application bird surveys have been ongoing at the subject site. Throughout the initial survey period (between April 2020 and September 2022), a comprehensive suite of bird surveys has been undertaken at the Wind Farm Site (as per NatureScot formerly SNH, 2017). This is now supplemented by an additional winter season of surveying from October 2022 to March 2023. Although not requested this data is volunteered as it serves to further corroborate the evidence of previous

surveys and the results of the impact assessment as reported in Chapter 7 of the EIAR. Appendix 2 of this document contains the data from the winter 2022/23 survey season.

The bird assemblage of the Wind Farm Site and findings of the bird surveys remained largely unchanged during the surveys from October 2022 up to and including March 2023. There was no significant change in the distribution and abundance of key ornithological receptors (KORs), such as Greenland white-fronted goose, whooper swan and kingfisher. Therefore, the impact assessments for KORs as outlined in the EIAR as lodged, continues to provide an accurate description of the impacts of the Wind Farm Site on the avian community at Ballivor Wind Farm. Additionally, an updated collision risk model has been conducted as collision risk was one of the key concerns raised. The updated analysis has incorporated all survey data, the results of which are outlined in Appendix 2 and discussed below.

Nocturnal Surveys

The Development Application Unit recommends that radar surveys of nocturnal migrants be undertaken to ***“establish the extent of such movements and allow estimation of collision risk to the species involved and determine whether mitigation may be required to minimise the mortality rates from collisions.”*** The key species specifically mentioned by the DAU were whooper swan and Greenland white-fronted goose.

The use of automated sensing techniques such as radar is more typically used for surveying birds offshore rather than at onshore wind farms. The offshore environment lacks the ground clutter (e.g., moving ground vegetation etc) that can undermine the radar's ability to provide reliable data. It should also be noted, as outlined in NatureScot formerly SNH (2017) concerning radar that *“such systems cannot discriminate between species of similar size and weight (e.g., common gull and golden plover produce similar echoes).”* In the specific case of whooper swan and Greenland white-fronted goose, the radar would not be able to differentiate these species from the several other species of migratory/wintering swans and geese that occur in Ireland. Furthermore, NatureScot (2017) *“recommends that radar is only used to assess sites where there is likely to be high nocturnal activity of important species, especially if a SPA qualifying species are potentially affected.”* In the present case, the comprehensive suite of surveys has demonstrated that there is no evidence for high levels of nocturnal activity. As outlined in Section 7.4 of the EIAR, whooper swan was recorded roosting at dusk on local water bodies. It is reasonable to assume that once on the roost, birds did not undertake further nocturnal flights. Greenland white-fronted goose were not recorded locally. Furthermore, as outlined in Section 7.6.2.6 of EIAR the whooper swan recorded during surveys were local winter residents and were not found to be connected with a SPA and there was no Greenland white-fronted goose present locally throughout surveying including the migratory period. Therefore, it would not be recommended to use radar at the proposed wind farm site following NatureScot (2017) criteria.

Instead of surveying with radar, NatureScot (2017) outlines that it is possible to estimate levels of nocturnal activity, in practice, this is done by applying a percentage increase on the flight activity recorded during vantage point surveys in the range of 25-28% depending on the species. As is noted in Section 2.4 of Appendix 7-6 of the EIAR, this was the approach taken to account for nocturnal flight activity in the assessment of collision risk. No significant collision risk was predicted for either whooper swan or Greenland white-fronted goose. Please refer to Section 7.6 of the EIAR for further detailed discussion.

The DAU raised concerns relating to the ***“no attempt to survey nocturnal migration over the development site appears to have been attempted and such migration is not addressed in the EIAR.”*** It is acknowledged that some waterbirds commute between feeding and roosting locations during periods of low light, typically before sunrise or after sunset. The DAU in particular highlights whooper swan and Greenland white-fronted goose as two species that habitually undertake such low light flights and that nocturnal migrants could be vulnerable to impacts. As a consequence of this behaviour, a diurnal schedule of surveys alone could miss these low light and nocturnal flights and hence under-represent the amount of flight activity for these species and consequently predict a lower rate of collision risk. However, the survey scope that was undertaken at the proposed wind farm site included the low light periods before sunrise or after sunset during the migratory/wintering season surveys.

It is noted in Appendix 7-2 of the EIAR, that winter vantage point surveys finished/started the hour after/before sunset/sunrise during the migratory/wintering period of September to April. The core period for Greenland white-fronted goose² and whooper swan³ in Ireland is October to May. These surveys were specifically designed to overlap with these previously mentioned periods of low light to ensure that commuting flights of waterbirds including Greenland white-fronted goose and whooper swan would be recorded. This survey approach is in line with best practices and follows the recommendation of NatureScot (2017). NatureScot (SNH, 2017) states in Table 1.3 that vantage point surveys targeting swans and geese should be undertaken “*between and including dawn and dusk*”. Throughout these migratory/winter vantage point surveys, no regularly used commuting corridor or migratory route was identified that crossed the wind farm site. Additionally, other survey types were conducted at the wind farm site which finished an hour after sunset (i.e., hen harrier roost surveys). However, no regularly used commuting corridor or migratory route was identified for whooper swan or Greenland white-fronted goose during these surveys.

As outlined in Section 7.6.2.6 of the EIAR as lodged, there was one irregularly used whooper swan roost site identified 700m north of the Wind Farm Site and two regularly used roosts identified, 2.5km south and 5km west of the Wind Farm Site. These roosts were identified when whooper swan were observed entering or leaving the roost sites, particularly in low light surveys at dawn or dusk. The identification of these roost sites proves the adequacy of the surveys in identifying commuting corridors of whooper swan between their foraging and roosting locations. It is reasonable to assume that once on the roost, birds did not undertake further nocturnal flights. Furthermore, whooper swan were observed commuting to these roost sites in low light levels during the vantage point surveys. However, no regularly used commuting corridors were identified that cross the wind farm site. Additionally, whooper swan were not using regular commuting corridors across the Wind Farm Site to access any of the three identified roost sites.

The DAU further stated that there is an “***absence of any assessment of the potential effects of the proposed wind farm on night-migrating birds.***” The key concern outlined in the DAU was an underestimation of the collision risk for night migrants.

An assessment of the potential effects of the proposed wind farm on night-migrating birds was undertaken through the robust survey approach and through the approach taken in undertaking the collision risk analysis. Nocturnal flights have been taken into account and included in the calculation of collision risk. As is noted in Section 2.4 of Appendix 7-6 of the EIAR, it is assumed that swan and waders were active for 25% of the night as well as the daylight hours as per NatureScot guidance to account for the potential for nocturnal flight activity⁴. Notwithstanding this, the analysis did not predict significant levels of collision risk for whooper swan. Please refer to Section 7.6.2 of the EIAR for further detailed discussion.

Greenland white-fronted goose was not recorded during the comprehensive suite of surveys undertaken at the Wind Farm Site between April 2020 and March 2023. The nearest known regularly occurring population of Greenland white-fronted goose is at Lough Iron which is c. 25km from the Application Site. Therefore, no significant effects are predicted.

The DAU also raised concerns regarding migrating passerines: “***Many passerine bird species migrate at night, including redwing, fieldfare and other thrush species, warblers and finch species***”. As outlined in Table 7-11 of the EIAR, it is generally considered that passerine species are not significantly impacted by wind farm developments, as per NatureScot guidelines. Additionally, please see below regarding the lighting of turbines for further discussion of the potential impact on night migrants.

² <https://www.bto.org/understanding-birds/birdfacts/white-fronted-geese>

³ <https://www.bto.org/understanding-birds/birdfacts/whooper-swan>

⁴ This 25% of the night is calculated as a portion of the length of the night for the survey period (provided by www.timeanddate.com) and is added to available hours of activity for these species per year.

In summary, an assessment of the potential effects of the proposed wind farm on night-migrating birds was undertaken and in particular, significant collision risk was not predicted for either wintering or migratory Greenland white-fronted goose or whooper swan (as per Section 7.6.2 of the EIAR). This assessment is based on a robust survey approach undertaken during the migratory period and allows for the propensity of these species to undertake nocturnal flights in the collision risk analysis. As no significant collision risk was predicted no mitigation is proposed.

Vegetation Removal

The DAU raised concerns about the seasonal timing of vegetation clearance with regard to the bird nesting season. They stated that ***“The EIAR is somewhat unclear with regard to the timing of proposed clearance of vegetation to facilitate the project”***. As outlined in Section 7.7.2.1 of the EIAR and reiterated here, it is proposed that any removal of vegetation to facilitate the construction of the Application Site will be conducted outside the breeding season (1st March to 31st August), to avoid the destruction of birds' nests, eggs and nestlings. Furthermore, limiting these works to the non-breeding season will limit the potential for disturbance of breeding birds during these activities.

Collision Risk

Concerns were raised as to the likely impact of predicted collisions on species of conservation concern. It was stated that: ***“regardless of the predicted likelihood and/or frequency of such collisions it is the Group’s considered opinion that these exceptionally important and endangered species cannot nor should not be put at any further risk.”***

As outlined in Section 7.6.2 of the EIAR as lodged, effects no greater than low effect significance (Percival, 2003) and long-term slight negative (EPA, 2022) were predicted for collision risk at the Wind Farm Site. An updated collision risk assessment has been conducted and is presented in Appendix 3 of this document. The updated collision risk assessment incorporates the most recent survey data (October 2022 to March 2023), and therefore assesses the full duration of bird surveys at the Wind Farm Site, from April 2020 to March 2023. This represents a 36-month survey period, consisting of three breeding seasons and three winter seasons.

Table 3-2 in Appendix 3 provides a comparison of the collision risk model as outlined in the EIAR as lodged, compared to the updated collision risk model which includes the most up to date survey data (from October 2022 to March 2023). The effect of the collision mortality from the Wind Farm Site was assessed in relation to the county population and the background mortality for each species. The percentage increase in background mortality as outlined in the EIAR, as lodged, and updated increase in background mortality is presented in Appendix 2, Table 3-2. This change is then assessed to establish if there is a significant change in the collision risk impact for each species.

As outlined in Table 3-2 in Appendix 3, there were no significant changes in the collision risk impact for any species assessed. Therefore, the impact assessment for collision risk on KORs as outlined in the EIAR as lodged, continues to provide an accurate description of the collision risk impact of the Wind Farm Site on the avian community at Ballivor Wind Farm.

Lighting

Concerns were raised about the impact of the lighting associated with the Ballivor Wind Farm Site on birds. Stating: ***“An Bord Pleanála is requested to invite the applicant to submit details regarding lighting at the proposed development and in particular, the address the impact of same on birds/bats, etc. This should include aviation lights on wind turbines, substation compound lighting proposals etc.”***

As some bird species are known to be attracted to artificial lighting (phototaxis), there is potential for some bird species to be put at increased risk of colliding with a turbine if attracted to artificial lighting on

turbines. However, some taxonomic groups (e.g., some burrow nesting seabirds) and nocturnally migratory species (especially passerines) are more attracted to lights than others. It is noted that there were no key ornithological receptors (KOR) from either of these groups identified at the Wind Farm Site. Please see Section 7.5 of the EIAR for further details on KOR identification. As detailed in the guidance document: Effects of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures. It is stated that:

“It is likely that collision risk at lit turbines for non-passerine taxa are likely to be relatively low in general.”

This is of note as all of the KORs identified at the wind farm Site were non-passerines. Notwithstanding the above, and out of an abundance of caution, the following mitigation is proposed to reduce the phototaxis of the required lighting on the proposed turbines.

- Typically, aviation warning lights are steady red lights, as flashing red lights have been shown to reduce collisions these will be used instead, or
- Green down-lights will be used. Green lights appear to be less attractive to birds and down-lighting shields bright light from most nocturnally flying birds (Poot *et al.* 2008), or
- An alternative approach is to only switch the lighting on when aircraft are near. Several systems react when aircraft approach an operational turbine. For example, the Obstacle Collision Avoidance System (OCAS) is designed to alert pilots if their aircraft is in immediate danger of flying into an obstacle.

The above mitigation would be subject to the Department of Defence and the Irish Aviation Authority (IAA) approval.

Species Specific Comments

The species listed below have been mentioned in one or more submissions on the Ballivor Wind Farm planning application. Each species will be addressed individually below and will cover all concerns raised in these submissions.

Greenland White-fronted Goose

Concerns were raised regarding migratory birds, including geese; ***“I am aware of the migratory birds, such as whooper swan, cuckoos and wild geese that travel across our property seasonally”***. Greenland white-fronted goose were not recorded during the comprehensive suite of surveys conducted at the Wind Farm Site between April 2020 and March 2023. Therefore, based on these data, there is no regular migratory or commuting corridor for this species over the Wind Farm Site. This limits the potential for impacts on this species. No significant effects are predicted.

Whooper swan and cuckoo are each discussed (below) under the relevant headings of this section.

Golden Plover

Concerns were raised regarding golden plover, particularly in relation to collision risk; ***“Golden plover have also been noted in the area and can be seen in large flocks of over 200-500 at a time. Again there is a high risk of collision with potential turbines”***. Golden plover were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.1 of the EIAR. As outlined in the EIAR, effects no greater than a low effect significance (Percival, 2003) and long-term slight negative effect (EPA, 2022) were predicted for golden plover. Observations of this species between October 2022 and March 2023 (as outlined in Appendix 2) further corroborate the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.1 of the EIAR, no significant effects are predicted.

Kingfisher

A number of submissions raised concerns regarding kingfisher with regard to foraging, nesting, habitat loss and collision risk. Additionally, Meath County Council (MCC) commented “***The sighted location of Kingfisher are within and surrounding the site. Turbine no. 21 is in the flightline of one incidental sighting (according to Figure 4-4d). An Bord Pleanála is requested to consider this matter in the context of potential impact on the Kingfisher.***” Kingfisher were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.3 of the EIAR. As outlined in the EIAR, effects no greater than a low effect significance (Percival, 2003) and long-term imperceptible negative effect (EPA, 2022) were predicted for kingfisher. Kingfisher were only observed on two occasions within 500m of the proposed turbine layout throughout the entire survey period (April 2020 to September 2022). This is a very low rate of occurrence. Additionally, there were no flights recorded at the potential collision height with turbines, as outlined in Section 7.6.2.3 of the EIAR, as lodged. Furthermore, there were no observations of this species, within 500m of the Wind Farm Site, between October 2022 and March 2023 (as outlined in Appendix 2), further outlining that this species is an irregular visitor to the Wind Farm Site and corroborating the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.3 of the EIAR, no significant effects are predicted.

While no significant effects are predicted for the kingfisher, pre-commencement bird surveys are proposed, as per Section 7.9.1 of the EIAR, to identify breeding and roosting locations of species of conservation concern including kingfisher. If a kingfisher nest location is identified a suitable disturbance buffer will be applied in line with best practice.

Short-eared Owl

Concerns were raised concerning short-eared owl; “***The short-eared owl and barn owl are both resident in our area and are often seen on the bog.***” Short-eared owl were fully considered with regards to impacts from the Wind Farm Site as part of the EIAR. As outlined in Section 7.5.1.8, short-eared owl were only observed on four occasions throughout the entire survey period (April 2020 to September 2022). Therefore, the Wind Farm Site is of no ecological importance to this species and significant impacts are not predicted. Additionally, there were no observations of this species between October 2022 and March 2023 (as outlined in Appendix 2), further corroborating that this species is an irregular visitor to the Wind Farm Site, and the Wind Farm Site is of no ecological importance to this species. In summary, no significant effects are predicted for this species.

Whooper Swan

Several concerns were raised with regard to whooper swans, including collision risk, commuting corridors and migrating birds. As previously stated and reiterated here, whooper Swan were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.6 of the EIAR. As outlined in the EIAR, effects no greater than a low effect significance (Percival, 2003) and long-term slight negative effect (EPA, 2022) were predicted for whooper swan. There were three roost sites identified for whooper swan within the wider area of the Wind Farm Site. The impacts of the Wind Farm Site on these roost sites were fully assessed as part of the EIAR, as lodged. Observations of this species between October 2022 and March 2023 (as outlined in Appendix 2) further corroborate the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.6 of the EIAR, no significant effects are predicted.

Barn Owl

A number of concerns were raised with regard to barn owl, including disturbance, collision risk and disturbance to nesting birds. Barn Owl were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.7 of the EIAR. As outlined in the EIAR, effects no greater than a low effect significance (Percival, 2003) and long-term slight negative effect (EPA, 2022) were predicted for barn owl. There were two breeding territories for barn owl identified within the wider area of the Wind Farm Site. The impacts of the Wind Farm Site on both of these breeding territories were fully assessed as part of the EIAR, as lodged. Observations of this species between October 2022 and March 2023 (as outlined in Appendix 2) further corroborate the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.7 of the EIAR, no significant effects are predicted.

Additionally, as a best practice measure, it is proposed to erect ten barn owl nest boxes for the benefit of local barn owls. Please see Section 7.8.2 of the EIAR for details.

Curlew

A number of submissions raised concerns regarding curlew with regard to disturbance and breeding curlew. Curlew were fully considered with regard to impacts from the Wind Farm Site as part of the EIAR. As outlined in Section 7.5.1.11, curlew were only observed on three occasions within 500m of the proposed turbine layout throughout the entire survey period (April 2020 to September 2022). There were no observations of curlew during the breeding season, and no breeding territories were identified. Therefore, the Wind Farm Site is of no ecological importance to this species and significant impacts are not predicted. There were no observations of this species, within 500m of the Wind Farm Site, between October 2022 and March 2023 (as outlined in Appendix 2). This further corroborates that this species is an irregular visitor to the Wind Farm Site, and the Wind Farm Site is of no ecological importance to this species. In summary, no significant effects are predicted for this species.

Buzzard

Concerns were raised regarding the impact on the local resident population of buzzard. Buzzard were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.13 of the EIAR. As outlined in the EIAR, effects no greater than a very low effect significance (Percival, 2003) and long-term imperceptible negative effect (EPA, 2022) were predicted for buzzard. Observations of this species between October 2022 and March 2023 (as outlined in Appendix 2) further outline that this species is an irregular visitor to the Wind Farm Site and corroborates the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.13 of the EIAR, no significant effects are predicted.

Yellowhammer

Concerns were raised regarding the impact on the local population of yellowhammer. As per SNH guidance, it is generally considered that passerine species are not significantly impacted by wind farms. Therefore, no significant impacts are predicted for the breeding population of yellowhammer at the Wind Farm Site.

Cuckoo

Concerns were raised regarding the impact on the local population of cuckoo. As per SNH guidance, it is generally considered that passerine species are not significantly impacted by wind farms. Therefore, no significant impacts are predicted for the breeding population of cuckoo at the Wind Farm Site.

Summary Conclusion

Following the clarification and explanation provided above, it is clearly demonstrated that the issues raised have been comprehensively addressed and that the information before An Bord Pleanála is adequate and no deficiencies in information remain. Furthermore, it has been demonstrated that the Application Site will not significantly impact avian populations of importance in the area.

2.1.5

Hydrology

This section presents the applicant's response to recurring themes pertaining to hydrology and hydrogeology and has been prepared in conjunction with Hydro Environmental Services (HES). The responses outlined below address the following recurring themes:

- General Surface Water Quality;
- Watercourse Crossings;
- Potential effects on drinking water supplies;
- Potential flood risk;
- Displacement of water by infrastructure;
- Potential effects on surface watercourses; and,
- WFD compliance.

Inland Fisheries Ireland (IFI) reiterated (similar to their scoping submission) and emphasised the general requirement for mitigation measures in order to protect water quality in the vicinity and downstream of the site, with particular emphasis on proposed watercourse crossings.

All of the matters raised in the submissions were addressed in Chapter 9 of the EIAR, in particular through the comprehensive suite of mitigation outlined in Section 9.5. However, the key issues raised in the submissions are summarised and addressed in the following sections:

General Surface Water Quality

Inland Fisheries Ireland (IFI) state the following in their letter to ABP (dated 2nd June 2023):

“Many of the proposed turbine sites are to be sited adjacent to a range of smaller watercourses which act primarily as contributories to downstream habitat for juvenile salmonids, lampreys and other species as well as macrophytes, algae and macroinvertebrates which as drift form a significant part of the food supply for downstream fisheries. All of the waters referred to have, in the context of the proposed development, the potential to convey deleterious matter from those works such as concrete, silt, fuel, paints, thinners and sewage effluent as well as lubricating and hydraulic oils from construction plant and equipment downstream unless proper safeguards are in place.”

This issue of surface water quality is dealt with comprehensively in the EIAR Chapter 9: Hydrology and Hydrogeology.

The avoidance of watercourses (using buffering) formed a key part of the design iteration process whereby sensitive hydrological features were avoided, where possible, by the application of suitable hydrological buffer zones (50m to natural watercourses). All of the key Proposed Development areas (turbines, hardstands, substation, construction compounds etc.) are located significantly away from the delineated 50m watercourse buffer zones except for the upgrading of the existing watercourse crossings, new drain crossings and upgrades to the existing site access tracks. The large setback distance from sensitive hydrological features means that adequate distance is maintained for the proposed drainage mitigation measures to be installed and operate effectively.

Furthermore, no natural watercourses exist within the proposed development site. The local hydrological regime has been altered to facilitate the historic peat extraction activities. The proposed development site is drained by a series of field drains which discharge to main drains which in turn discharge to settlement

ponds around the perimeter of the bog. These settlement ponds attenuate surface water and remove suspended solids prior to discharge at the existing bog outfalls. The existing drainage infrastructure is operating in accordance with IPC licence requirements, with environmental monitoring and silt control measures currently being implemented at the site. The existing drainage system at the proposed site will be maintained and expanded locally as required for use within the Proposed Development drainage system. Furthermore, the existing water treatment systems will be upgraded and improved as a result of the Proposed Development. Consequently, there will be no untreated discharge of water from the Proposed Development Site.

Mitigation measures for the protection of surface water quality during the construction, operational and decommissioning phases of the Proposed Development are detailed in Section 9.5.2, Section 9.5.3 and Section 9.5.4 of the EIAR respectively.

For clarity, and with respect to the concerns raised by IFI, we cross-reference to mitigation contained within the submitted EIAR as follows:

Deleterious Matter Source	Proposed Mitigation (EIAR Section Ref.)	
	Construction Phase	Operation Phase
Concrete (Cementitious material)	Section 9.5.2.6	Section 9.5.3.3
Silt/sediment	Section 9.5.2.1	Section 9.5.3.2
Fuel/Hydrocarbons & Chemicals	Section 9.5.2.5	Section 9.5.3.2
Sewage	Section 9.5.2.7	Section 9.5.3.5

Table 2. EIAR Mitigation Measures References

Finally, a WFD Compliance Assessment is appended as Appendix 9-3 to the EIAR. This assessment concludes that with the implementation of the proposed mitigation measures for the protection of surface and groundwater quality and quantity there will be no change in the WFD status of the underlying groundwater bodies (GWBs) or downstream surface waterbodies as a result of the Proposed Development. Furthermore, the Proposed Development will not prevent these SWBs or GWBs from achieving their respective WFD objectives in the future.

Watercourse Crossings

IFI also provide observations and recommendations for the crossing of watercourses.

All of the key Proposed Development areas (turbines, hardstands, substation, construction compounds etc.) are located significantly away from the delineated 50m watercourse buffer zones except for the upgrading of the existing/established watercourse crossings, new drain crossings and upgrades to the existing site access tracks. Upgrade of 2 no. existing/established watercourse crossings are proposed (upgrades to the existing crossing over the Killanconnigan stream between Ballivor and Carranstown bogs, and upgrades to the existing crossing over the Cartenstown stream between Bracklin and Lislogher bogs).

The EIAR presents detailed mitigation measures for works being completed in close proximity to watercourses. These includes the expansion of the existing bog drainage network and upgrades and improvements to the existing water treatment systems including interceptor drains, collector drains, silt traps and settlement ponds.

There are no natural watercourses within the bog, and where site roads and hardstands cross the main bog drains, culverts will be installed with a minimum gradient to reduce the entrainment of suspended solids and also the potential for erosion.

With respect to other comments made by IFI, we confirm the following:

- No fords were mapped at the site, and the creation of fords is not proposed as part of the Proposed Development.
- No temporary watercourse crossings are proposed.
- The proposed Grid Connection does not cross any natural watercourses.
- Culverts/Culvert upgrades are proposed within the bog areas, but none of the mapped drains within the Ballivor Group of Bogs have any ecological significance.
- A comprehensive drainage plan for the construction stage of the proposed development is included in Appendix 4-3 of the EIAR. The use of silt traps, existing settlement ponds, and silt fencing is detailed in those plans.
- Use of weather forecasts and rainfall thresholds are defined within Section 9.5.2.1 of the EIAR, and these are intended to assist in the protection of water quality during the construction phase.
- No natural flowpaths will be altered as a result of the proposed development.
- No preferential flowpaths will be created by the proposed development.
- The Proposed Development will comply with the requirements of IFI (2016), i.e. Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, Inland Fisheries Ireland (2016).
- No instreams works of any nature on natural watercourses are proposed.
- Imported and site-won aggregate materials used for access track and hardstand construction will have a suitable engineering quality, and as such will not breakdown or deteriorate over time.

With regard to Nature Conservation the NPWS submission states that:

“In chapter of the EIAR Hydrology and Hydrogeology, section 9.5.7.5 titled ‘Cumulative Effects with Regards the Proposed Decommissioning and Rehabilitation Plans for the Ballivor Bog Group’ maintains that the “overall footprint of the Proposed Development is <2% of the total area of the Ballivor Bog Group (2,419ha)”. However, this estimate fails to take account of that the hydrology of a much larger area of the bog complex will be affected by the development of the windfarm turbines, associated roads and other infrastructure across the entire bog group. The areas available for rehabilitation as bogland habitats and function to sequester Carbon in line with the Peatland Climate Action Scheme (PCAS) for the Ballivor Bog Group may consequently be constrained.”

As stated in Section 9.5.7.5 of the EIAR, the decommissioning and rehabilitation of each of the bogs comprising the Ballivor Bog Group will be updated to incorporate the Proposed Development infrastructure.

The Proposed Development has a total development footprint of c. 52.17ha. Therefore, the Proposed Development will result in the loss of approximately 52.17ha of cutover peat bog which could potentially have been restored and rehabilitated. This loss is viewed as an acceptable consequence of the Proposed Development. The loss of land is small in comparison with the overall area of the Proposed Development Site (c. 2.9%).

The residual bog outside of this 52.17ha is heavily modified cutover raised bog. Whilst it is acknowledged that the drainage proposals associated with the Proposed Development will further reduce the area available for rehabilitation, this area will still be relatively small and will only comprise small areas immediately adjacent the proposed drainage infrastructure *i.e.* drains and settlement ponds. We are firmly of the opinion that rehabilitation plans for the site, including significant hydrological improvements, can sit side by side with the proposed wind farm development, and this combination of land use has already been established at other similar sites such as Mount Lucas Wind Farm, Cloncreen Wind Farm, Bruckana Wind Farm, and will be further proven at Derrinlough Wind Farm.

Furthermore, the carbon saving and carbon sequestration benefits of developing the Wind Farm along with the rehabilitation of the overall land holding are clearly set out in Chapter 10 of the EIAR.

Potential Effects on Drinking Water Supplies

Local surface water and groundwater drinking supplies are identified in Section 9.3.15 of the submitted EIAR. A comprehensive assessment of the potential effects on local drinking supplies (surface water and groundwater) is presented in Section 9.5 of the EIAR (refer to Sections 9.5.2.2, 9.5.2.4, 9.5.2.8, and 9.5.2.9).

Due to the local hydrogeological regime, which is characterised by high rates of surface water runoff and low rates of groundwater recharge, surface water is the main sensitive receptor. As stated in Section 9.3.8 of the EIAR:

“Due to the presence of the peat at the proposed site and the bulk low permeability of the underlying mineral subsoil deposits, local groundwater recharge will be minimal. Recharge is likely to be limited to the perimeter of the bog where the peat is thin or absent (the presence of peat will prevent rapid recharge to underlying regional groundwater systems). Groundwater movement through the underlying subsoil glacial deposits will be relatively slow unless higher permeability sands and gravels are present..... Localised groundwater flow directions will occur, with groundwater discharging to nearby streams and rivers such as the Deel (Raharney) river to the west of the proposed site and the Stonyford river to the east.”

With respect to surface water drinking supplies, the Stonyford_040 SWB in the vicinity of the proposed development site is listed in Article 7: Drinking Water Protected Area (DWPA). During the construction phase, surface water connections from the proposed development site to the Stonyford River could transfer poor quality surface water that may affect this waterbody. However, proven and effective measures to mitigate the risk of surface water contamination have been proposed within the EIAR and they will break the pathway between the potential source and the downstream receptor. The implementation of the mitigation measures (sediment: Section 9.5.2.1; hydrocarbons: Section 9.5.2.4; concrete: Section 9.5.2.6; wastewater: 9.5.2.7) as detailed in the EIAR will ensure that surface water runoff and groundwater discharge from the proposed site is equivalent to baseline conditions and will therefore have no effect on downstream surface water drinking supplies, including the Stonyford DWPA.

The potential impact on local groundwater wells was thoroughly assessed in the EIAR in Section 9.5.2.2 and Section 9.5.2.8. These assessments were based on the local hydrogeological regime, the properties of the underlying bedrock aquifer, the recorded thickness of overburden/subsoil deposits, the recorded depth to groundwater levels, and the location of the nearest wells. The assessment was completed in accordance with “Wind farms and groundwater impacts - A guide to EIA and Planning considerations” (DoE/NIEA, 2015).

There is limited potential for impacts on local groundwater wells for the following reasons:

- There are large separation distances between the proposed development works and local houses where wells are located;
- All proposed excavations are temporary, and are near surface;
- Limited temporary dewatering may be required at turbine bases;
- the EIAR presents comprehensive mitigation measures for the protection of groundwater quality during all phases of the Proposed Development with respect to hydrocarbons, cement-based products, wastewater and also assesses the potential effects associated with piled foundations. The implementation of these mitigation measures, combined with the prevailing hydrogeological regime, will ensure that there are no residual effects on groundwater quality.

As stated in Section 9.5.2.8 of the EIAR, there are several dwellings in close proximity to BP2. The Proposed Development will comprise the excavation of dry aggregate (above the water table) and wet aggregate (below the water table). Wet extraction can be completed without dewatering, therefore we consider that there is limited potential for water level effects on any nearby wells. Groundwater quality effects, such as increased turbidity is extremely unlikely to transmit through the sand and gravel deposits, as those materials themselves are very good natural filters. Other potential effects from hydrocarbons can be mitigated by the implementation of the controls outlined in the EIAR in Section 9.5.2.5. Blocking of regional groundwater flowpaths (by turbine bases and associated piled foundations) will not occur as clearly outlined in the assessment presented in the EIAR in Section 9.5.2.4. As outlined in the EIAR and above, the applicant is happy to monitor local wells within 500m of BP2 during the temporary construction phase at that location.

To summarise, the purpose of the EIAR is to assess likely significant effects. We are satisfied, based on the prevailing hydrogeological conditions at the Proposed Development Site, that the assessment of potential effects on groundwater quality and quantity (groundwater levels and flows) as a result of the Proposed Development is imperceptible. HES is satisfied that this assessment is valid and underpinned by a comprehensive geological and hydrogeological dataset.

Potential Flood Risk

A detailed Flood Risk Assessment (FRA) was completed by HES and submitted by the Applicant as an Appendix to Chapter 9 of the EIAR (Appendix 9.1). This FRA assesses the potential flood risk at the Proposed Development Site.

The flood risk assessment notes that the Local Authority Strategic Flood Risk Assessment mapping indicates that areas in the northwest of Lisclogher Bog are vulnerable to fluvial flooding. However, site walkover surveys have revealed that this section of the EPA mapped watercourse does not exist and that this error has resulted in incorrectly mapped SFRA flood zones in this region of the Proposed Development Site. Based on site observations, the lack of flooding in winter 2015/2016 (as indicated in the GSI Historic Flood Mapping from 2015/2016) and the high drainage density within the bog, the actual flood risk in this area is the same as for the rest of the site and it should be mapped within Flood Zone C.

The main risk of flooding at the site is via pluvial flooding due to the low permeability soils and subsoils. However, the surface of the bog contains an extensive network of drains which had reduced the overall risk of pluvial flooding. Following periods of intense or prolonged rainfall events, localised surface water ponding may still occur in places.

Overall, the FRA concludes that the Proposed Development Site is located within Flood Zone C and is at low risk of flooding.

A 3rd party submission makes specific reference to concerns regarding the proposed substation with respect to flooding. A detailed flood risk assessment for the proposed substation location is presented in Section 4.6 of the submitted FRA (Appendix 9-1 of the EIAR). Conservative volumetric analysis has determined the peak flood levels at the proposed substation site for 100-yr and 1000-yr rainfall events to be 74.3 and 74.6m OD respectively. The primary control in the analysis is the expanse of the bog in Carranstown West which needs to fill with pluvial flood water before the substation site can flood. It was therefore recommended in the FRA to give the substation a minimum floor level of >74.9mOD (74.6mOD + 0.3m freeboard)⁵. At this elevation the risk of flooding at the substation site is negligible. Regarding concerns about the increased flood risk associated with the Proposed Development, the proposed wind farm drainage will not significantly alter the existing drainage regime at the proposed site. Moreover, the proposed drainage system will be fully integrated into the existing bog drainage systems.

⁵ Note: As per the submission from Meath Co. Co. (see section 3.1 below), the applicant is happy to comply with the 500mm freeboard requested by Meath Co. Co..

Existing field drains and main drains will be routed under/around proposed wind farm access tracks using culverts as required. Runoff from access tracks, turbine bases, and developed areas (construction compounds, sub-station, met masts etc) will be collected and treated in local (proposed) silt traps and settlement ponds and then discharged to existing local peat field drains. From there this water will flow towards the proposed site boundaries in field drains and main drains) and be treated further in the existing main settlement ponds prior to discharge from the proposed site at greenfield runoff rates.

In addition, Bord na Móna intend to implement decommissioning, and rehabilitation plans at the proposed site as required under condition 10 of the IPC licence for the site. These plans aim to stabilise and rehabilitate the peat bogs by placing the existing peatland environments on a path towards naturally functioning peatlands. With the implementation of the rehabilitation plans, surface water runoff from the Ballivor Bog Group will be reduced, thereby decreasing the downstream flood risk. Furthermore, the proposed wind farm development will be constructed with its own drainage system which will provide additional surface water attenuation. The cumulative effect of the Proposed Development and the Decommissioning and Rehabilitation Plans is that there will be a reduced risk of fluvial flooding downstream of the proposed site.

Displacement of Water by Infrastructure

Several 3rd party submissions raise concerns about the importation of large volumes of material and the potential for this to cause flooding in the surrounding lands.

All the bogs are residual cutover basins, from which large volumes of peat have been removed historically over the course of 30/40 years of peat extraction. This point is illustrated in Figure 9.1 of the EIAR, where the darker shading around the edges of bogs indicates higher ground. The maximum volume of material to be imported is approx. 717,000m³ (taking the conservative approach that all materials are imported rather than using the onsite borrow pits) and this volume could never replace what has been removed, therefore the potential to change flood volumes or flood patterns by the proposed development is negligible.

The potential for increased surface water discharge rates as a result of the Proposed Development due to the replacement of natural surfaces with lower permeability surfaces has been addressed in Section 9.5.3.1 of the EIAR.

The baseline scenario at the Proposed Development Site is characterised by high surface water runoff rates due to the presence of low permeability peat (96% runoff / 4% groundwater recharge). Therefore, in a worst-case scenario, assuming that the proposed development footprint is completely impermeable (100% runoff), there would only be a small increase in local runoff rates. Furthermore, the footprint of the Proposed Development represents only 2.9% of the total site area. The increase in runoff from the Proposed Development will, therefore, be negligible even before mitigation measures are considered.

The proposed mitigation measures include the provision of a new proposed drainage system which will provide surface water attenuation at the site to ensure that there is no increase in surface water runoff. It is proposed that runoff from the proposed infrastructure will be collected locally in new proposed collector drains, silt traps and settlement ponds prior to release into the existing drainage network. The new proposed drainage measures will then in effect create significant additional attenuation to what is already present at the proposed site. The net effect of this will be a reduction in the overall runoff coefficient of the bog. Our assessment at Section 9.5.3.1 of the EIAR shows that there will be a potential 11% reduction in runoff volumes from the proposed site once the proposed drainage measures have been implemented. This assessment demonstrates that there will be no risk of exacerbated flooding downstream of the proposed site as a result of the Proposed Development. The Proposed Development will in effect retain water within the bog for longer periods.

Potential Effects on Surface Watercourses

Several 3rd party submissions raise concerns regarding the potential effects of the Proposed Development on nearby surface watercourses. This issue of surface water quality is dealt with comprehensively in the EIAR Chapter 9: Hydrology and Hydrogeology. Comprehensive mitigation measures for the protection of surface water quality for the construction, operational and decommissioning phases of the proposed development are detailed in Section 9.5.2, Section 9.5.3 and Section 9.5.4 of the EIAR respectively. Furthermore, a WFD Compliance Assessment is appended as Appendix 9-3 to the EIAR. This assessment concludes that with the implementation of the proposed mitigation measures for the protection of surface and groundwater quality and quantity, there will be no change in the WFD status of downstream surface waterbodies as a result of the Proposed Development.

WFD Compliance

1 no. 3rd party submission refers to the Water Framework Directive (WFD).

A detailed WFD Compliance Assessment Report was submitted as Appendix 9-3 to the EIAR. This report presents all available WFD information for those waterbodies (surface and groundwater) in the vicinity and downstream of the Proposed Development Site and assesses the potential for the Proposed Development to impact these waterbodies in both an unmitigated and a mitigated scenario.

The 3rd party submission makes particular reference to the Athboy Groundwater Body (GWB) which is “at risk” of failing to meet its WFD objectives. This is referenced in the WFD Compliance report, with this GWB listed as being under significant pressure from agricultural activities. The potential for the Proposed Development to affect this GWB is limited due to the local hydrogeological regime (high surface water runoff rates and low rates of groundwater recharge). Nevertheless, the WFD Compliance Report assesses the potential for the Proposed Development to affect the status of the GWB during the construction, operation and decommissioning phases.

The WFD Compliance Assessment concludes that with the implementation of the mitigation measures proposed in the EIAR, there will be no potential for effects on any waterbody, and that the Proposed Development:

- will not cause a deterioration in the status of all surface and groundwater bodies assessed;
- will not jeopardise the objectives to achieve ‘Good’ surface water/groundwater status;
- does not jeopardise the attainment of ‘Good’ surface water/groundwater chemical status;
- does not jeopardise the attainment of ‘Good’ surface water/groundwater quantity status;
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- is compliant with the requirements of the Water Framework Directive (2000/60/EC); and,
- is consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) (Note that a full list of legislation complied with in relation to hydrology and hydrogeology is included in Section 9.1.4 of EIAR Chapter 9).

2.1.6 Shadow Flicker

The observations received pertaining to shadow flicker are grouped into the following matters:

1. *Assessment methodology:*
 - a. *House numbering discrepancy, houses within 4x tip height setback houses within 1000m;*
 - b. *Indoor & Outdoor phenomena;;*
2. *Efficacy of mitigation measures;*
3. *Breach of guidelines pertaining to shadow flicker limits;*
4. *Health impacts from shadow flicker; and*

5. Nighttime lighting impacts.

Assessment Methodology

A discrepancy with housing numbers was observed by the residents at Woodtown House, Athboy, Co. Meath. Figure 5-6 of the EIAR denotes Woodtown House as property no. 125, which is the correct property reference number for the purposes of the assessment. In Figure 5-7 it appears that property No. 125 is labelled as no 115. However, this occurred as a result of the additional data being illustrated on Figure 5-7 i.e. in order to fit the data, the corresponding labels adjusted resulting in the label for property no. 115 moving towards the location of property no 125. The relevant information regarding the potential for shadow flicker to occur at property no 125 can be found in Table 5-9 in the EIAR. It is this Table that details the potential for, and degree of, shadow flicker experienced at any property, not the supporting mapping found within Chapter 5 Population and Human Health. The shadow flicker prediction model demonstrates that property no. 125 may experience just over 16 minutes of daily shadow flicker, just over half the daily recommended limit of 30 minutes per day and may experience over 54 hours of annual shadow flicker, which is greater than the recommended 30 annual hours of shadow flicker as set by the Department of Housing and Local Government (Wind Energy Guidelines 2006). However, it must be noted that the prediction model does not take into account:

- > Any existing screening provided by intervening vegetation or buildings;
 - o The property is screened by mature tree lines
- > Assumes zero cloud cover with adequate wind speed;
 - o Rare phenomenon alone and in combinations with the other assumptions;
- > Assumes that the rotors are facing the property;
 - o In reality, this is highly unlikely to be the case for many properties.
- > Does not factor 'as built' window orientation of dwellings.

An observation was made stating that mitigation through screening would not suffice at their 4-storey property and blinds cannot be fitted in a satisfactory fashion. However, it is noted that there is significant mature treeline vegetation between the property in question and the Proposed Development Site already which the shadow flicker model has not accounted for. It has also not accounted for window orientation of the property. Observations on the efficacy of mitigation at this property and others is discussed below.

An Observation was made regarding to errors in Table 5-10 titled '*Potential Cumulative Shadow Flicker Impact above WEGS 2006 permitted levels from the Proposed Ballivor Wind Farm and surrounding Wind Farms within 5km.*' The Observation notes that within this table, it is reported that the nearest turbines to houses numbered H89–H93 are Turbines T89-T93. This is a reporting error, and the correct information is already produced in Table 5-9 indicating that the nearest turbine to houses numbered H89–H93 is Turbine 22.

An Observation was made stating that the turbines are not sited 4x tip height from the curtilage of the nearest dwellings from a shadow flicker perspective and therefore the Proposed Development does not comply with the 2019 draft Wind Energy Guidelines (draft WEGs). The Observation notes 3 houses: H180 being within 800m of T3, H83 being within 800m of T14 and adds that T7 is within 800m of the nearest house but does not provide the house number.

The current 2006 WEGS recommends that '*shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year or 30 minutes per day.*' It does not make reference to 'curtilage'. The draft WEGs states that no shadow flicker should occur at any property. The draft WEGs recommends a 4x tip height set back from turbines for the protection of visual amenity, as opposed to shadow flicker, and this set back is subject to a mandatory set back of 500m. The draft WEGs defines curtilage as:

'land immediately surrounding a dwelling house which is used for purposes incidental to the enjoyment of the dwelling house as such and excludes for example any open fields beyond the immediate surrounds

of the dwelling. In the case of buildings associated with other noise sensitive properties the curtilage would be the area in the immediate surrounds of the relevant buildings.'

When applying the above definition to H83, excluding the farmyard outbuildings which are facing the Proposed Development, the distance from the curtilage of the property to the nearest proposed turbine exceeds 4x tip height. When applying the above definition to H180 excluding the garage and gardens immediately west of the garage which are nearest the Proposed Development, the curtilage of the property exceeds 4 x tip height. A house number was not provided for the dwelling closest to T7. Eircode records and developments in planning indicate that the nearest property curtilage is H205 which is over 4x tip height from T7. It should also be noted that these three properties have considerable vegetative screening between them and the nearest turbine and in the case of T83 and T180, screening is also afforded by intervening outbuildings and a garage, respectively.

Furthermore, as outlined in Chapter 5, Section 5.5.2 of the EIAR, should the draft WEGs or any future WEGs recommending zero shadow flicker come into effect while the Proposed Development is still in the planning process, the wind farm can be brought in line with a zero shadow flicker requirement through inbuilt technology discussed below.

An observation was made that properties within 1000m will be affected by shadow flicker while some observations commented that houses to the east of the Proposed Development would be impacted as the sun was setting. As stated in the EIAR (and reproduced from the 2019 draft WEGs, the UK Department of Energy and Climate Change), due to the latitude of Ireland (and the UK) shadow flicker impacts are only possible at properties 130 degrees either side of north (i.e., a shadow flicker event can only occur within this 260-degree span; turbines do not cast shadows to their south. As such properties located outside of this potential shadow flicker zone (50 degrees either side of south) will not be impacted. However, in this assessment, all 217 no. properties within 360 degrees of the Proposed Development out to 1.7km were assessed for shadow flicker impact. The list of properties was arrived at through a collation of all properties with eircodes (confirmed on the ground through site visits), properties without eircodes (confirmed on the ground through site visits) and all properties that are both in planning and proposed as listed on the Meath, Westmeath and An Bord Pleanála planning portals up to date to the time of application submission. Approximately 31 properties within 1000m may experience shadow flicker exceedances of more than 30 minutes per day or 30 hours per year as recommended in the 2006 adopted WEGs.

Mitigation for these properties was outlined in Section 5.6.3.2.6 of the EIAR and is included below. The same mitigation measures also demonstrate that the proposed Ballivor Wind Farm can be operated in accordance with the shadow flicker requirements of the Draft Revised Wind Energy Development Guidelines (2019) should they be adopted while the planning application is being determined..

An observation was made seeking clarification on why shadow flicker is an indoor only phenomenon. As discussed in Chapter 5 Population and Human Health section 5.2.2.1.1, Shadow flicker effect is considered to be an indoor phenomenon as it requires light to be projected through a focused narrow space; when outdoors, the changes in light are dispersed across a vast space and therefore are not concentrated on one area, minimising the visual effect of the shadow flicker occurrence. This phenomenon is found through industry-wide research and international literature. Chapter 5 section 5.2.2.11 refers defers to the United Kingdom's Department of Energy and Climate Change titled *Update of UK Shadow Flicker Evidence Base Department of Energy and Climate Change* which details this and is reiterated in the 2019 Draft Wind Energy Guidelines.

It is a requirement of the Department of Defence (DOD) and the Irish Aviation Authority for any tall structures to have lighting attached to prevent any potential for aviation impacts. The DOD requested the following conditions should the Ballivor Wind Farm be consented:

1. *All turbines or tall structures, should be illuminated by high intensity obstacle lights that will allow the hazard be identified and avoided by aircraft in flight.*

2. *Obstruction lights used should be incandescent or of a type visible to Night Vision Equipment. Obstruction lighting fitted to obstacles must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.*
3. *Due to the nature of flight operations by the Irish Air Corps the above mentioned are separate to any ICAO and IAA lighting requirements.*

As required by the DOD, the obstruction lighting can be ‘of a type visible to Night Vision Equipment’. Obstruction lighting fitted to obstacles must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum specifically at or near 850 nanometres (nm) of wavelength’. Near Infra-Red lighting is not visible to the human eye, it is only detectable with night vision aviation equipment.

The Irish Aviation Authority (IAA) recommend the following conditions should the Ballivor Wind Farm granted a consent:

1. *agree an aeronautical obstacle warning light scheme for the wind farm development,*
2. *provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location and*
3. *notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.*

The IAA recommend that the Developer and the IAA enter into an agreement in relation to an aeronautical obstacle warning light scheme upon consent. As such, discussions therein will not commence until the planning determination process has ended.

Health Impacts of Shadow Flicker

Observations were made pertaining to the potential for, and types of health impacts shadow flicker can cause on human health such as distress, nuisance and effects on autism. Please see section 3.1.8 below where health impacts of wind farms are discussed.

Efficacy of Mitigation

Observations were made pertaining to the suitability and/or efficacy of mitigation measures contained within Chapter 5 of the EIAR- Population and Human Health, submitted with the application. As stated in Chapter 5 of the EIAR, the properties listed as having the potential for shadow flicker exceedances will be surveyed to determine the level of occurrence, existing screening and window orientation. The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties and the following process will be followed:

1. *Recording the weather conditions at the time of the site visit, including wind speeds and direction (i.e., blue sky, intermittent clouds, overcast, moderate breeze, light breeze, still etc.).*
2. *Recording the house number, time and duration of site visit and the observation point GPS coordinates.*
3. *Recording the nature of the sensitive receptor, its orientation, windows, landscaping in the vicinity, any elements of the built environment in the vicinity, vegetation.*
4. *In the event of shadow flicker being noted as occurring the details of the duration (times) of the occurrence will be recorded.*

If it is found that shadow flicker exceedances do occur, screening proposals will be investigated and discussed with each property that may be impacted. If a screening solution cannot be found, wind turbine control measures will be implemented. Wind turbines can be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding

the wind farm. The shadow flicker control units will be added to any required turbines. A shadow flicker control unit allows a wind farm's turbines to be programmed and controlled using the wind farm's SCADA control system to change a particular turbine's operating mode during certain conditions or times, or even turn the turbine off if necessary. All predicted incidents of shadow flicker can be pre-programmed into the wind farm's control software. The wind farm's SCADA control system can be programmed to shut down any particular turbine at any particular time on any given day to ensure that shadow flickers occurrences at properties which are not naturally screened or cannot be screened with measures outlined above.

Where such wind turbine control measures are to be utilised, they need only be implemented when the specific combined circumstances occur that are necessary to give rise to the shadow flicker effect in the first instance. Therefore, if the sun is not shining on a particular day that shadow flicker was predicted to occur at a nearby property, there would be no need to shut down the relevant turbines that would have given rise to the shadow flicker at the property. Similarly, if the wind speed was below the cut-in speed that caused the turbine rotor to rotate and give rise to a shadow flicker effect at a nearby property, there would be no need to shut down the relevant turbines that otherwise would have caused shadow flicker. The moving blades of the turbine will require a short period of time to cease rotating in the shutdown process and as such there may be a very short period (less than 3 to 5 minutes) during which the blades are slowed to a complete halt.

Breach of EIAR Guidelines

The current adopted guidelines that are applicable to the proposed Ballivor Wind Farm are the 2006 Wind Energy Guidelines (2006 WEGs) produced by the Department of Environment, Heritage and Local Government produced with assistance by Sustainable Energy Ireland, An Bord Pleanála, Cork County Council, Geological Survey of Ireland, Irish Aviation Authority, and Dr E.R. Farrell of Trinity College Dublin. The 2006 WEGs recommend '*shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year or 30 minutes per day.*' The 2006 WEGs note that this recommendation comes from research by an EU sponsored organisation promoting best practice in energy use and supply and draws on experience from Belgium, Denmark France, the Netherlands and Germany. The 2006 WEGs adds that where shadow flicker could be a problem, the developer should take appropriate mitigation measures to ameliorate the potential effect, such as by turning off a particular turbine at certain times. As stated above, the Applicant is committed to complying with the adopted 2006 WEGs where the recommended shadow flicker will not exceed 30 minutes per day or 30 hours per year. If it is found that this does occur at properties, and existing or proposed additional screening cannot reduce the effect, the Applicant will use inbuilt SCADA technology as discussed above to bring the Proposed Development in line with the adopted 2006 WEGs. Furthermore, should the Draft Revised Wind Energy Development Guidelines 2019 which recommends zero shadow flicker come into force during the planning application process for this development, the proposed Ballivor Wind Farm can also comply with these guidelines through this inbuilt SCADA control system. Likewise, should entirely new wind energy guidelines be adopted in 2024 (as suggested in Climate Action Plan 2023) also recommend zero shadow flicker effects, the Proposed Development will also be able to comply with these guidelines through the SCADA technology.

2.1.7 Property Value

Several observations were made regarding the potential for the proposed Ballivor Wind Farm to result in property devaluation in the area. As detailed in Chapter 5 of the EIAR - Population and Human Health, there are no studies on the potential for impact on property values from wind farm developments in Ireland, with the largest study on property value impacts from wind farms undertaken in the USA in 2009 by Lawrence Berkley National Laboratory (LBNL). This study, entitled 'The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi Site Hedonic Analysis', (LBNL, 2009), concluded that:

“Based on the data and analysis presented in this report, no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected by either the view of wind facilities or the distance of the home to those facilities. Although the analysis cannot dismiss the possibility that individual or small numbers of homes have been or could be negatively impacted, if these impacts do exist, they are either too small and/or too infrequent to result in any widespread and consistent statistically observable impact.”

The study was updated by LBNL in August 2013 through the publication of a paper entitled ‘A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States’ (LBNL, 2013). The result of the study concluded the following:

“Across all model specifications we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post announcement/pre-construction periods.”

Likewise, a 2014 UK study, carried out by the Centre for Economics and Business Research (Cebr) and referenced in Chapter 5 Population and Human Health Section 5.3.12, came to similar conclusions stating that the county-wide property market drives property values not the presence or absence of wind farms, adding that studies across 5 areas in England and Wales where wind farms were constructed did not experience a detectable impact on house properties. This study also concluded that in some circumstances, wind farms can improve property values.

As set out in Chapter 5 of the EIAR submitted with the Application, another study in Scotland in 2016 by an independent body, analysed sales on over 500,000 properties and concluded that there no evidence of a consistent negative effect on house prices.

‘Across a very wide range of analyses, including results that replicate and improve on the approach used by Gibbons (2014), we do not find a consistent negative effect of wind turbines or wind farms when averaging across the entire sample of Scottish wind turbines and their surrounding houses. Most results either show no significant effect on the change in price of properties within 2km or 3km or find the effect to be positive. Results vary across areas: The results vary across different regions of Scotland. Our data does not provide sufficient information to enable us to rigorously measure and test the underlying causes of these differences, which may be interconnected and complex.’

To conclude, while the presence of wind farms influencing an individual buyer’s opinion on a property is subjective to that individual, on an empirical level, there is no international evidence to indicate that wind farms have impacted the value of properties in areas near wind farms.

2.1.8 Human Health

The observations received pertaining to health impacts are grouped into the following concerns:

- General health impacts from wind farms; autism, epilepsy, anxiety, migraines, infrasound effects and dementia.
- Turbine Safety concerns, site safety concerns e.g., fire
- Concerns regarding dust, noise and vibration emissions from construction activities and construction traffic including along Turbine Delivery Route

General Health Impacts

As discussed in section 5.1.4 of Chapter 5 of the EIAR, Population and Human Health, that while there are anecdotal reports of negative health effects on people who live very close to wind turbines, peer-reviewed research has generally not supported these statements. There is currently no published scientific evidence to positively link wind turbines with adverse health effects. Extensive research has been carried out in the US, Canada, UK, Australia, and by the World Health Organisation (2018) and the HSE (2017). All studies conclude that that exposure to wind farms and the sound emanating from wind farms does

not trigger adverse health effects. The HSE (2017) Position Paper on wind turbines and public health was published to address the rise in wind farm development and concerns regarding potential impacts on public health.

The paper discusses previous observations and case studies which describe a broad range of health effects that are associated with wind turbine noise, shadow flicker and electromagnetic radiation. A number of comprehensive reviews conducted in recent years to examine whether these health effects are proven has highlighted the lack of published and high-quality scientific evidence to support adverse effects of wind turbines on health. The HSE position paper determines that current scientific evidence on adverse impacts of wind farms on human health is weak or absent. Further research and investigative processes are required at a larger scale in order to be more informative for identifying potential health effects of exposure to wind turbine effects. The Position Paper, taking guidance from the WHO concludes:

- *‘There is no direct evidence that considered possible effects on health of infrasound or low-frequency noise from wind farms;*
- *The risk of shadow flicker from wind farms triggering a seizure among people with this condition is estimated to be extremely low;*
- *Limited evidence suggests that the level of extremely low-frequency electromagnetic radiation close to wind farms is less than average levels measured inside and outside suburban homes.’*

It should be noted that the Proposed Development complies with the draft 2019 WEGs of a 4x tip height set back from the nearest residential dwelling in order to protect for visual amenity. It should also be noted that in relation to noise and shadow flicker, turbine technology allows for the turbines to be curtailed to meet noise conditions or shadow flicker thresholds.

Furthermore, the Proposed Development was subject to several design iterations following detailed desktop studies and extensive, multi-seasonal walkover surveys, investigative works, modelling (noise, shadow flicker, traffic volumes, photomontages, ornithological and bat collision risk), cumulative studies with the permitted Bracklyn Wind Farm, data collation from available Geographical Information Systems (GIS) datasets, and building upon an extensive bank of known data collected by Bord na Móna over the decades, in order to optimise the design while minimising the potential for impacts. Through this process, in some instances, the proposed turbines have been moved in excess of 800m from the nearest residential receptor to minimise the potential for visual amenity impacts and to minimise the potential for cumulative noise impacts with Bracklyn Wind Farm. It is also worth noting that a total of 6 turbines were removed from the initial design to minimise the potential for impacts on residential visual amenity. Please see Chapter 3 Consideration of Reasonable Alternatives for details.

Turbine Safety concerns

The Department of the Environment, Heritage and Local Government (DoEHLG)’s ‘Wind Energy Development Guidelines for Planning Authorities 2006’ and the ‘Draft Revised Wind Energy Development Guidelines’ (Department of Housing, Planning and Local Government (DoHPLG), December 2019), iterate that there are no specific safety considerations in relation to the operation of wind turbines. As detailed in section 5.1.4.2 of Chapter 5 Population and Human Health, the blades are composite structures with no bolts or separate components and the danger is therefore minimised. The build-up of ice on turbines is unlikely to present problems. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to resuming operation. Turbine blades are manufactured of glass reinforced plastic which will prevent any likelihood of an increase in lightning strikes within the site of the Proposed Development or the local area. Lightning protection conduits will be integral to the construction of the turbines. Lightning conduction cables, encased in protection conduits, will follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during the construction of the turbine foundations.

As discussed in section 5.4.2.5 and Chapter 15 Vulnerability of the Proposed Development to and from Natural Disasters, the potential for the Proposed wind farm to be impacted by or cause fire, contamination/pollution or flooding is very low due to the nature of the development itself and the site type:

- Spacing of turbines and separate distance between dwellings and turbines.
- Significant storage within each of the bog basins to alleviate any flood risk from pluvial flooding which is the main type of flooding risk associated with a peat site.
- Relatively flat topography of the site resulting in a low risk of instability or peat slippage.
- Considerable distance from SEVESO sites.
- Limited use of hazardous materials on site. Any such materials will be stored and banded appropriately.

Dust, Noise and Vibration emissions

Noise and vibration, dust, CO₂ and other emissions generated during the construction phase (which includes the turbine delivery route, delivery of construction materials and construction of borrow pit) are assessed throughout the EIAR, and in particular, Chapter 10 Air and Climate, Chapter 11 Noise and Vibration and summarised in Chapter 5 Population and Human Health. Chapter 14 Material Assets assesses the predicted traffic volumes generated by the construction, operation and decommissioning phases of the Proposed Development as well as potential impacts on the flow of traffic in the area.

Using EPA guidelines, the baseline air quality is determined to be Zone D which is representative of rural areas in Ireland. The EPA monitors air quality data at various Zone D sites across the State which have been used as representative as the type of air quality found at the Proposed Development Site. At Zone D sites, no exceedances of Sulphur Dioxide (SO₂), Particulate Matter (PM₁₀), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO) and Ozone (O₃) have been recorded.

There are no statutory limits for dust deposition in Ireland. The German TA-Luft standard for dust deposition sets a maximum permissible emission level for dust deposition of 350 mg/m²/day. Recommendations from the Department of the Environment, Health & Local Government⁶ apply the Bergerhoff limit of 350 mg/m²/day to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction activities associated with the Proposed Development. Dust monitoring was carried out at the Proposed Development site as required by the IPC Licence (P0501-01) for peat extraction and is reported annually in Annual Environment Reports (AERs) submitted to the EPA each year. The AERs indicate that no exceedances of the dust emission limit value of 350 mg/m²/day over the period 2000 – 2020 were recorded when extraction was underway. Therefore, it can be concluded that dust emissions at the site are considerably less today since peat extraction ceased in June 2020. The levels of emissions listed above are considered to be the baseline at the Proposed Development Site against which the level of emissions generated during the construction, operation and decommissioning phases are assessed in Chapter 10 and 11 and summarised in Chapter 5.

The impact assessment in Chapter 10 Air and Climate concluded that there will be:

- No significant effects on air quality from exhaust emissions during all three phases.
- No significant effects on air quality from exhaust emissions for the construction of the onsite borrow pit (construction phase only).
- No significant effects on air quality from exhaust emissions during delivery of materials to the Proposed Ballivor Wind Farm Site.
- No significant effects on air quality from dust emissions during the construction of turbines, 110kV substation and other onsite wind farm infrastructure.

⁶ DOEHLG (2004) *Quarries and Ancillary Activities, Guidelines for Planning Authorities*

- No significant effects on air quality from dust emissions during the construction of the borrow pits.
- No significant effects on air quality from dust emissions generated by the transport of materials to the Proposed Ballivor Wind Farm Site.
- No significant effects on air quality during the construction of turbines, 110kV substation and other onsite wind farm infrastructure.

The impact assessment in Chapter 11 Noise and Vibration concluded that the predicted worst case residual noise and vibration effects will be:

- Short-term slight negative noise and vibration effects during the construction of the turbines, hardstands, substation and ancillary infrastructure.
- Short-term imperceptible to not significant negative noise and vibration effects from the movement of construction traffic.
- Short-term significant negative noise and vibration effects from the movement of construction traffic between Trim and Doolistown on the R161. This movements will be intermittent over a short-term time frame and predicted noise level due to traffic along this road remains within the construction noise of 65dB LAeq, 12hr.
- Long-term negative moderate noise effects from the operational turbines. The effect should be considered in terms that the effect is variable, and that this assessment considers periods of the greatest potential effect.
- Long-term negative imperceptible effects from the operation of the substation.
- There are no expected sources of vibration associated with the operational phase of the Proposed Development and as such, has been assessed as long-term negative imperceptible effect.
- Short-term negative slight effects from the decommissioning of the turbines and ancillary infrastructure.
- Long-term moderate cumulative effects during the operational phase of Ballivor and the consented neighbouring Bracklyn Wind Farm (PA25M.311565).

Please see section 2.1.18 for further details on Noise and Vibration effects from the Proposed Development.

2.1.9 Carbon Release

The observations received pertaining to Carbon Release are grouped into the following concerns:

1. *Release of carbon as a result of disturbance to a natural carbon sink goes against the governments policy on reducing carbon emissions.*
2. *The climate and air quality section of the EIAR lacks clarity with regard to carbon calculations. Also claims there are discrepancies in the Carbon payback assessment.*
3. *When all is taken into account, from manufacturing, transport, forestry removal etc this project will have little or no value in reducing CO₂ emissions.*

Carbon Release goes against Government Policy on Reducing Carbon Emissions

As stated in Chapter 10 Air and Climate, the Climate Action Plan 2023 includes Six Vital High Impact Sectors, two of which are relevant to the Proposed Development as outlined in the following extracts:

“Powering Renewables – 75% Reduction in emissions by 2030

We will facilitate a large-scale deployment of renewables that will be critical to decarbonising the power sector as well as enabling the electrification of other technologies.

- *Accelerate the delivery of onshore wind, offshore wind, and solar.*

- *Dial up to 9 GW onshore wind, 8 GW solar, and at least 7 GW of offshore wind by 2030 (with 2 GW earmarked for green hydrogen production).*
- *Support at least 500 MW of local community-based renewable energy projects and increased levels of new micro-generation and small-scale generation.*
- *Phase out and end the use of coal and peat in electricity generation.*
- *New, dynamic Green Electricity Tariff will be developed by 2025 to incentivise people to use lower cost renewable electricity at times of high wind and solar generation.”*

and

“Changing Our Land-Use - Exact reduction target for this sector is yet to be determined.

The first phase of the land use review will tell us how we are using our land now. Then, we can map, with evidence, how it can be used most effectively to capture and store carbon and to produce better, greener food and energy.

- *Increase our annual afforestation rates to 8,000 hectares per annum from 2023 onwards.*
- *Rethink our Forestry Programme and Vision.*
- *Promote forest management initiatives in both public and private forests to increase carbon sinks and stores.*
- *Improve carbon sequestration of 450,000 ha of grasslands on mineral soils and reduce the management intensity of grasslands on 80,000 ha of drained organic soils.*
- *Rehabilitate 77,600 hectares of peatlands.”*

As stated in Chapter 10 Air and Climate, the Proposed Development represents a significant opportunity to be a nationally important wind energy generator, contributing to the 51% reduction in emissions required by the Climate Action and Low Carbon Development (Amendment) Act 2021. The output range for the 26 turbine Ballivor Wind Farm is considered within this EIAR to be from 4.5 MW to 6.5 MW, which would result in an estimated installed capacity of (117 MW to 169 MW). The Proposed Development is therefore considered compliant with the relevant planning policies and objectives set out at both the European and National tiers of governance such as CAP 2023. It is anticipated that if planning permission was granted, the Proposed Development would commence construction in 2026 thus contributing significantly to the 2030 targets of 9 GW of onshore wind energy and 80% electricity generated from renewable sources.

Carbon Calculations/Carbon Payback Assessment Discrepancies

It should be noted that there is a typo in Chapter 10 Air and Climate where it is reported that the carbon savings from the Proposed Development range from 6,035,010 tonnes to 8,717,237 tonnes of Carbon Dioxide (CO₂) ‘*per annum*’ (Relative to EU FFC) rather than ‘*over its lifetime*.’ We would like to take the opportunity to clarify that the carbon savings from the Proposed Development ranges from 6,035,010 tonnes to 8,717,237 tonnes of Carbon Dioxide (CO₂) over its lifetime (Relative to EU FFC).

As discussed in Chapter 10 Air and Climate section 10.3.7.1, the Proposed Wind Farm Site predominately comprises cutover peatland which has been subject to industrial peat extraction and drainage over several decades and consequently the peatland habitats and hydrology are highly degraded and modified from their original state. As such, the peatland habitat loss due to an introduced development footprint would not be as significant as that of an intact peatland. Despite this, it is essential that any wind farm development in a peatland area saves more CO₂ than is released.

Bord na Móna have developed a carbon loss calculation methodology based on the Scottish Government Carbon Calculator and extensive peer reviewed carbon balance literature, which was used to assess the effects of the Proposed Development footprint in terms of potential carbon losses and savings. The calculations take into account peat removal, drainage, construction (including manufacture of wind farm infrastructure and delivery to site) and operation of wind farm. As detailed in Table 10-16 of Chapter 10 of the EIAR - Air and Climate, it is calculated that the construction phase, including components manufacture and delivery to site, will result in a loss of 384,030 tonnes of CO₂ into the atmosphere.

Taking a 4.5MW turbine model as an example, the Proposed Wind Farm would save 6,035,010 tonnes of CO₂ being released into the atmosphere from fossil fuels over the Proposed Developments lifetime and would offset the 384,030 released from the construction phase after just 2.37 years. Taking a 6.5MW turbine model as an example, the Proposed Wind Farm would save 8,717,237 tonnes of CO₂ being released into the atmosphere from fossil fuels over the Proposed Developments lifetime and would offset the 384,030 released from the construction phase after just 2.21 years.

The methodology reflects the specific nature of the cutaway peat lands upon which the project is proposed to be located by utilising the output of research carried out on Bord na Móna lands. The calculations factor in the carbon sequestration factor of the cutover bogs and the carbon savings through peatland rewetting proposals. It has been calculated that the Proposed Development, with a potential installed capacity in the range discussed above will offer significant benefits in terms of renewable energy production and reductions in greenhouse gas emissions by its net displacement of approximately 6,035,010 tonnes and 8,717,237 tonnes of CO₂ over the Proposed Developments lifetime (Against EU Fossil Fuel Comparator (FFC)).

An observation was made regarding the capacity factor of 31.7% included in Appendix 10-1 Ballivor Wind Farm Carbon Calculations stating its difference to the factor reported in Chapter 4 Description of the Proposed Development. The factor 31.7% was used in Appendix 10-1 Carbon balance calculations is the capacity factor reported by SEAI in 2019. The capacity factor used in Chapter 4 is an average capacity factor reported by SEAI for the period 2015 to 2021; 2022 figures have not been released yet. Capacity factors vary depending on the year and the difference between the two used in the EIAR does not materially impact the payback period of the Proposed Development nor does it have any material impact on the conclusion of the EIAR that the Proposed Development will result in significant carbon savings.

An observation was made stating that the carbon payback assessment in Appendix 10-1 is based on a peat disturbance of 11.97ha which differs from the total development footprint of 32.4ha as reported in Chapter 8 Land, Soils and Geology. The carbon payback assessment is not based on a peat disturbance of 11.97ha. The total permanent footprint of the wind farm is 32.4ha as reported in Chapter 8. The carbon balance calculations are based on the development footprint including temporary elements, and the potential carbon release from spreading excavated peat which is 45.45ha as reported in Appendix 10-1. As such, the carbon balance calculations, and consequently the net carbon savings and payback period, factor in additional potential carbon release sources than just ground disturbance from the permanent footprint.

An observation was made querying how a 6.5MW turbine model would have a lower lifecycle emissions than the 4.5MW model. Larger models produce more megawatts per hour. The bigger the power output, the greater the renewable energy production and therefore the emissions lifecycle is shorter.

Project will have little or no value in reducing CO₂ emissions

Without the Proposed Development

As part of Bord na Móna's Integrated Pollution Control licence, upon cessation of peat extraction activities the licensee must produce peatland rehabilitation plans detailing rehabilitation procedures, programme, and expected outcomes for each bog. The key objectives of the plans are environmental stabilisation and re-wetting of the cutaway areas. This will aid in restoring the carbon store function and promote the carbon sink potential of the land. This will have a materially beneficial impact in raising the carbon sink potential of the land when compared to its current status. This which will be carried out between and surrounding the proposed windfarm infrastructure. For example, during construction for access tracks, hardstands and other areas, peat is excavated from the cutaway, moved to the side, graded into berms not more than 1m and allowed to naturally re-vegetate. This has proven successful during construction of Mountlucas and Cloncreen Wind Farms. It is anticipated it will take up to 30 years for naturally functioning wetland and peatland ecosystems to fully re-establish. In addition to this, the applicant is rolling out the Peatland Climate Action Scheme which is an enhanced form of accelerated

peatland rehabilitation above and beyond what is required under IPC licence and which is possible on suitable areas of Bord na Móna peatland. PCAS has recently been rolled out at Carranstown East and Bracklyn West Bogs which form part of the Ballivor Bog Group and are located immediately adjacent to the Application Site boundary. This accelerated form of peatland rehabilitation has already been successfully implemented at Mountlucas and Cloncreen Wind Farms. The PCAS scheme is supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC). The National Parks and Wildlife Service (NPWS) acts as the Scheme regulator and there is ongoing engagement with the EPA. This accelerated form of peatland rehabilitation will speed up the formation of habitats and vegetation back onto the bare peat (putting a "skin" back onto the peat). Better results for water quality improvements, climate action, the reduction of carbon emissions and biodiversity are achieved when the peat is re-wetted. This means drain-blocking and other measures to raise water levels to the surface of the bog and to encourage the naturally functioning peatland cutaway habitats. Both schemes will be implemented within (IPC peatland rehabilitation and adjacent to the Wind Farm Site Boundary (PCAS in selected areas) regardless of the planning decision for the current Proposed Development, and both are designed to coexist onsite harmoniously with future renewable energy developments as is evident at the operational Mount Lucas and Cloncreen wind farms where rehabilitation and PCAS has been implemented.

With the Proposed Development

As discussed above and detailed in Table 10-16 of Chapter 10 of the EIAR - Air and Climate, it is calculated that the construction phase, including components manufacture and delivery to site, will result in a loss of 384,030 tonnes of CO₂ into the atmosphere. Taking a 4.5MW turbine model as an example, the Proposed Wind Farm would save 6,035,010 tonnes of CO₂ being released into the atmosphere from fossil fuels over the Proposed Developments lifetime and would offset the 384,030 released from the construction phase after just 2.37 years. Taking a 6.5MW turbine model as an example, the Proposed Wind Farm would save 8,717,237 tonnes of CO₂ being released into the atmosphere from fossil fuels over the Proposed Developments lifetime and would offset the 384,030 released from the construction phase after just 2.21 years.

The cumulative benefit of the carbon savings (potentially over 5 million over its lifetime) as a result of the proposed Ballivor Wind Farm along with the provision of providing a carbon sink within the re-wetted peatlands through the peatland rehabilitation of all bogs under IPC licence and the accelerated form of peatland rehabilitation, would assist the national and international objectives for offsetting CO₂ emissions and achieving a climate neutral Ireland by 2050 as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

If the Proposed Development would not proceed, the cumulative impact of providing a carbon sink within the re-wetted peatlands through the peatland rehabilitation under IPC licence and accelerated rehabilitation under PCAS, combined with the carbon savings of between 6,035,010 tonnes and 8,717,237 tonnes of CO₂ as a result of the proposed Ballivor Wind Farm (lifetime operation) would be lost as would the change to assist in the national goal of achieving a climate neutral Ireland by 2050 as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021. This would be a long term significant negative impact on National CO₂ emissions and climate action goals.

2.1.10 Telecoms and Aviation

Observations were made pertaining to the potential for impacts on telecommunication links, specifically broadband connections. As detailed in Chapter 14 Material Assets Section 14.2 and Appendix 14-3 Telecommunications Impact Study, the Commission for Communications Regulations (ComReg) was contacted to provide a list of all telecommunications operators in the area of the Proposed Development. All operators provided by ComReg were contacted and subsequently provided their infrastructure coordinates and required setbacks from turbines. A Telecommunications Impact Study was undertaken by Telecommunications Consultants AI Bridges who re-contacted all operators, undertook an impact

assessment and established refined setbacks from each link which were agreed, in writing with all operators who confirmed that the proposed turbine locations and dimensions would not negatively impact on their infrastructure.

With respect to Aviation, an observation was made stating the turbines would cause danger to air traffic. As outlined previously in Section 2.1.7 of this report (Night time lighting) submissions received from DoD and IAA during the EIA scoping phase outline that they require any tall structures to have lighting attached to prevent any potential for aviation impacts and Bord na Móna have committed to consult with them in this regard should consent be granted.

As discussed in Chapter 2 Background to the Proposed Development (section 2.5), Chapter 14 Material Assets (Section 14-2) and contained within Appendix 2-1 Scoping Responses, an EIA scoping response was received from the Irish Aviation Authority (IAA) on the 15th of February 2021 who stated that the nearest licenced aerodrome, Athboy is located over 10km from the Proposed Development and therefore had no specific requirements for integration into the EIAR. They provided three requirements should the development be consented pertaining to a data share. Please see section 3.1.6 of the EIAR for details. Additionally, the applicant has engaged with the landowner of a local unlicensed airfield located at Craddanstown. The landowner did not make a submission to the application in question, nor did he have express any concerns with the Proposed Development.

2.1.11 Employment

A couple of observations queried the number of jobs the project would generate, in one case citing that the EIAR stated up to 20 full time jobs would be provided and asked for clarity given that circa 2-3 full time staff work at the Mountlucas Wind Farm.

As discussed in Chapter 5 Population and Human Health, the Ballivor Wind Farm will be built out towards the latter half of the decade, thus contributing to the 2030 targets, providing up 100-120 jobs during the construction period 2-3 permanent jobs for the operational lifetime of the development and an estimated 20 and 40 jobs during decommissioning. The project will also result in significant rate payment to both Co. Meath and Co. Westmeath as well as providing approximately €14 million Community Funding for the local area over the lifetime of the project.

2.1.12 Tourism

Observations were made pertaining to the impact on tourism from wind farms with reference to declining tourism in Scotland in the vicinity of wind farm developments. As stated in Chapter 5 Population and Human Health, studies on the public perception of wind farms were undertaken extensively in both Scotland and Ireland. As recently as December 2022, Wind Energy Ireland carried out a survey to ‘measure and track perceptions and attitudes around wind energy amongst Irish adults’ with the results published in their *Public Attitudes Monitor December 2022* report. As detailed in Chapter 5, the results of the survey are as follows:

A total of 1,017 adults were surveyed along with a supplementary booster sample of 201 rural dwellers. The results are as follows:

- *4 in 5 nationally (80%) are now in favour of wind power. This is an increase of +6% versus last year's results.*
- *Amongst rural residents, 4 in 5 registered favourable attitudes. This is the highest level recorded since tracking commenced in 2017.*
- *Almost half (45%) ranked cheaper electricity as the top wind energy benefit with reductions in CO2 cited as the second wind energy benefit.*
- *The survey prompt ‘I don’t know of any benefits’ has fallen again, to just 1 in 10 this year.*
- *Amongst rural residents, reducing negative feedback levels is evident year on year.*

- *Nationally, 58% said they would be in favour of a wind farm in their area. Again, this marks highest number in favour since tracking began.*
- *Amongst rural residents just 1 in 10 registered being opposed.*

The results of these findings are in line with survey results carried out in Scotland (2016) *Wind Farms and Tourism Trends in Scotland* (Chapter 5 Section 5.3.9.31). The study considered the evidence for impacts from wind farms at a local authority level and in the immediate vicinity of constructed wind farms. Eight local authorities had seen a faster increase in wind energy deployment than the Scottish average. Of these, five also saw a larger increase in sustainable tourism employment than the Scottish average, while only three saw less growth than the Scottish average. The analysis presented in this report shows that, at the Local Authority level, the development of onshore wind energy does not have a detrimental impact on the tourism sector. It was found that in the majority of cases (66%) sustainable tourism employment performed better in areas surrounding wind farms than in the wider local authority area. There was no pattern emerging that would suggest that onshore wind farm development has had a detrimental impact on the tourism sector, even at the very local level. Overall, the conclusion of this study is that published national statistics on employment in sustainable tourism demonstrate that there is no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level, nor in the areas immediately surrounding wind farm development.

The conclusions discussed above are in line with previous surveys conducted by researchers at the University of St. Andrews and The Macaulay Institute, Aberdeen, on public perceptions of wind power in both Scotland and Ireland (2003/4). The survey found that large majorities of people are strongly in favour of their local wind farm, their personal experience having engendered positive attitudes. Attitudes towards the concept of wind energy were described as “overwhelmingly positive” at both study sites in Scotland, while the Irish survey results showed almost full support for renewable energy and 92% support for the development of wind energy in Ireland. The reasons that people gave for their positive attitude to the local wind farm were predominantly of a global kind, i.e., environmental protection and the promotion of renewable energy, together with opposition to a reliance on fossil fuels and nuclear power. With regards to those who changed to a more positive attitude following construction of the wind farm, the reasons given were that the wind farm is “*not unattractive (62%), that there was no noise (15%), that community funding had been forthcoming (15%) and that it could be a tourist attraction (8%)*”.

The findings of the Irish survey reinforce those obtained at the Scottish sites with regards to the increase in positive attitudes to wind power through time and proximity to wind farms. The survey found that the highest levels of support for wind power were recorded in the innermost study zone (0 – 5 kilometres from a point in between the pair of wind farms). The data also suggests that “*those who see the wind farms most often are most accepting of the visual impact*”. Overall, the study data reveals “*a clear pattern of public attitudes becoming significantly more positive following personal experience of operational wind farms*”.

2.1.13 Construction and Decommissioning

A number of observations were made with respect to the impact of construction activity, hours of construction and associated noise generated from the works and their impact on amenity, human health etc. A response to observations on construction and decommissioning generally are addressed in the following paragraphs. Please refer to Section 2.1.8 for a response to observations relating to human health and Section 2.1.18 for a response to observations made on Noise and Vibration.

As stated throughout the EIAR it is proposed to undertake construction works from 7am to 7pm Mondays to Saturdays. To ensure that optimal use is made of good weather period or at critical periods within the programme, it may be necessary on occasion to work outside of these hours. However, the construction works hours will be subject to conditions set out by the consenting authority should the Proposed Development receive a grant of permission. As discussed in Chapter 14 Material Assets, transportation of large turbine components will be carried out at night under Garda escort when traffic is at its lightest.

A Traffic Management Plan for abnormal loads will be produced and agreed with relevant roads authorities and An Garda Síochána in advance of any abnormal load deliveries.

Observations made regarding decommissioning related to leaving turbine foundations on site and disposal methods of turbine blades at end of life. It is considered to be environmentally prudent to backfill over foundations rather than bulldoze concrete that has been in situ for 30 years. Currently, there are many ways in which turbine blades are being recycled and reused. For example, turbine blades have been incorporated into bridges, street furniture, playground, bike shelters. Recently, a wind blade pedestrian bridge was installed along the Middleton to Youghal greenway in Co. Cork. Given the long timeframe, technological advances and recycling/reusing viabilities will likely have changed and improved. Therefore, it is probable that all components of the turbines will be repurposed into many more uses than the ones listed above.

2.1.14 Cumulative Assessment

Observations were made regarding the lack of cumulative assessment with other proposed plans or projects within the surrounding landscape. As detailed in Chapter 2 section 2.4 *Planning History* and 2.6 *Cumulative Impact Assessment*, the potential cumulative impact of the Proposed Development and other relevant developments has been carried out with the purpose of identifying what likely significant effect the Proposed Development will have on the surrounding environment when considered cumulatively and in combination with relevant permitted, proposed, and constructed projects within the site boundary and within the vicinity of the proposed site.

The cumulative impact assessment of projects has three principle aims:

- To establish the range and nature of existing projects within the cumulative impact study area of the Proposed Development, to inform the baseline environment.
- To summarise the relevant projects which have a potential to create cumulative impacts.
- To identify the projects that hold the potential for cumulative interaction within the context of the Proposed Development and discard projects that will neither directly nor indirectly contribute to cumulative impacts.

The approach taken to Cumulative Impact Assessment is set out in Chapter 2 Background to the Proposed Development, in particular Sections 2.4 and 2.6. The purpose of the cumulative impact assessment was to identify the likely significant effects the Proposed Development would have on the surrounding environment when considered cumulatively and in combination with relevant permitted, proposed, and constructed projects both within the site boundary and within the vicinity of the proposed development site.

Assessment material for the cumulative impact assessment was gathered through a search of relevant online Planning Registers, reviews of relevant EIAR (or historical EIS) documents, planning application details (including planning drawings), and served to identify past and future projects, their activities and their environmental impacts. In addition to this, Wind farms out to 25km were considered as well as rehabilitation plans proposed under IPC licence requirements and the Peatland Climate Action Scheme.

Developments included in the cumulative assessment are listed in Chapter 2 of the EIAR as follows:

- Table 2-5 - Applications within the Application Site Boundary;
- Table 2-6 - Consented Wind Farms within 25km of the Development Site (including Bracklyn Wind Farm); and
- Table 2-6 - Proposed Wind Farms within 25km of the Development Site and
- Appendix 2-4 – Planning Applications in the Surrounding Landscape.

The assessment of cumulative impacts of the proposed development together with all other relevant developments is included as required in each of the impact assessment chapters of the EIAR i.e., Chapters 5 – 16 inclusive.

2.1.15 Scoping

An Observation was made that the scoping responses by HSE, Department of Agriculture, Food and the Marine and Fáilte Ireland were not included in the EIAR. Please see Appendix 4 for details.

An Observation was made that the scoping responses by HSE, Department of Agriculture, Food and the Marine and Fáilte Ireland were not included in the EIAR.

As part of the EIAR Scoping process circa 50 Stakeholders were contacted including the HSE, Department of Agriculture, Food and the Marine, and Fáilte Ireland. The Department of Agriculture, Food and the Marine and Fáilte Ireland both responded, and their responses were included in Appendix 2.1 of the EIAR on Page 80 and Page 82, respectively. The HSE did not respond.

2.1.16 Consideration of Alternatives

The observations received pertaining to alternatives to the Ballivor Wind Farm are grouped into the following concerns:

1. *Wind farms are not green energy.*
2. *Offshore or other technologies should be considered instead; no evidence of other considerations.*

As discussed above and Chapter 10 Air and Climate, taking a 4.5MW turbine model as an example, the Proposed Wind Farm would save 6,035,010 tonnes of CO₂ being released into the atmosphere from fossil fuels over the Proposed Developments lifetime and would offset the 384,030 released from the construction phase after just 2.37 years. Taking a 6.5MW turbine model as an example, the Proposed Wind Farm would save 8,717,237 tonnes of CO₂ being released into the atmosphere from fossil fuels over its lifetime and would offset the 384,030 released from the construction phase after just 2.21 years.

As discussed above and Chapter 2 Background to the Proposed Development and Chapter 10 Air and Climate, the objectives of the Climate Action Plan 2023 include:

- Powering Renewables – 75% Reduction in emissions by 2030
- Large-scale deployment of renewables that will be critical to decarbonising the power sector as well as enabling the electrification of other technologies.
- Accelerate the delivery of onshore wind, offshore wind, and solar.
- Dial up to 9 GW onshore wind, 8 GW solar, and at least 7 GW of offshore wind by 2030 (with 2 GW earmarked for green hydrogen production).

The output range for the 26 turbine Ballivor Wind Farm is considered within this EIAR to be from 4.5 MW to 6.5 MW, which would result in an estimated installed capacity of (117 MW to 169 MW). The Proposed Development is therefore considered compliant with the relevant planning policies and objectives set out at both the European and National tiers of governance such as CAP 2023 above. It is anticipated that if granted, the Proposed Development would commence construction in 2026 thus contributing significantly to the 2030 targets of 9 GW of onshore wind energy and 80% electricity generated from renewable sources.

The Applicant, Bord na Móna, has a long track record of developing energy projects, dating back to the development of the first generation of peat-fired power stations. In recent times, the business has gone

through radical change, announcing the new “Brown to Green” strategy, committing to the cessation of peat harvesting, and focusing on developing climate solutions in renewable energy, sustainable waste management, carbon storage and biodiversity conservation. A key objective of this strategy involves using the land to continue to underpin Ireland’s energy independence by developing green, sustainable energy sources to assist with Ireland’s commitment to achieve 80% renewable electricity by 2030. Bord na Móna’s lands extend to approximately 80,000 hectares in total and are located mainly in the Irish midlands. Bord na Móna currently manages and operates a portfolio of thermal and renewable assets, namely Edenderry Power Plant a peat/biomass co-fired electricity generating unit, Cushaling peaking plant, Cloncreen Bellacorick, Mountlucas, Bruckana and Oweninny wind farms, Derrinlough windfarm (under construction), Timahoe North solar farm and the Drehid landfill gas facility. The potential for the Applicant to investigate the development of an offshore wind farm at this stage is not viable. Furthermore, a key metric of CAP 2023 is for onshore wind to make up the bulk of renewable energy targets out to 2025 (6GW) and out to 2030 (9GW). The Proposed Development will go a long way to facilitating the State reaching this important target.

Chapter 3 of the EIAR - Consideration of Reasonable Alternatives includes a comparator assessment with solar farm construction and operation at the same site with the same output range of 117MW to 169MW. As demonstrated to achieve the same energy output from solar energy, the site would require a significantly larger development footprint due to the significant difference in capacity factors between solar and wind technologies and the footprint of the technology infrastructure. In addition, a solar development would have a higher potential environmental effect on Hydrology and Hydrogeology (larger areas requiring a higher level of drainage infrastructure), Traffic and Transport (construction phase) and Biodiversity (habitat loss) at the site. A solar farm of scale for the required output would require greater peat and spoil generation and may have a greater potential to impact on unknown subsurface archaeology. Furthermore, the capacity factor of solar PV array technology with a 117MW to 169MW output not have the as great a capacity factor and therefore would result in a longer carbon payback period. This would not be a ‘greener’ option.

2.1.17 Roads and Traffic

Submissions from members of the public relating to Roads and Traffic are summarised under the following topics, and a response to these submissions has been prepared by Alan Lipscombe Traffic and Transport Consultants:

- Increase in traffic volumes generated by the Proposed Development and suggestion that development generated traffic will have greater impact than presented in EIAR.
- Impact on integrity / and potential damage to already substandard carriageway.
- Safety concerns including in relation to the R156 and local schools.
- Concerns relating to dust levels.
- Concerns relating to emissions from trucks.

Increase in traffic volumes generated by the Proposed Development and suggestion that development generated traffic will have greater impact than presented in EIAR

It is acknowledged that there will be significant volumes of additional HGV traffic movements generated during the 24 month construction period for the Proposed Development, as set out in Section 14.1.4 of the EIAR. A summary of the additional HGV movements is as follows;

- During the 26 days concrete foundations are poured an additional 75 HGVs will travel to and from the site (360 x 2-way passenger car equivalent units (pcus)),
- For 484 days when general site preparation and construction will take place, an additional 181 HGVs will travel to and from the site (871 x 2-way pcus),

- During 47 nights a convoy of 5 abnormally sized loads will travel to and from the site (100 x 2-way pcus),
- On a further 26 days 6 HGVs will travel to the site per day (29 x 2-way pcus).
- Up to an additional 60 car trips (120 x 2-way pcus) generated by construction staff travelling to and from the Proposed Development Site will also take place per day.

Background traffic volumes on the proposed delivery route were established for the proposed construction year commencing 2026 from traffic counts and TII growth forecasts, as set out in Sections 14.1.3.1 and 14.1.3.2 of the EIAR.

The impact on traffic volumes on the delivery route was then established for each of the 4 types of delivery days as set out in Section 14.1.5 of the EIAR. A summary of the likely and significant traffic related impacts during the construction of the Proposed Development is then provided in Section 14.1.9.2 of the EIAR, as follows;

During the 26 days of Construction Stage 1 when the concrete foundations are poured the effect on the surrounding road network will be negative, resulting in an increase in traffic levels ranging from 1.6% on the M3 to an increase of 64.4% on the R161 between Trim and Doolistown. The effect will be negative, will be temporary and will be slight.

During the remaining 484 days of Construction Stage 1 for the site preparation and ground works when deliveries to the site will take place, the effect on the surrounding road network will be negative, resulting in an increase in traffic levels ranging from 3.2% on the M3, to an increase of 133.0% on the R161 between Trim and Doolistown. While the percentage increase at this location is high, it is accentuated by the relatively low background traffic volume. On these days, the effect will be negative, short term and will be slight.

During the 47 days of Construction Stage 2 when the abnormally sized component parts of the wind turbine plant are delivered to the site using extended articulated HGVs, the effect of the additional traffic on these days will be moderate due to the size of vehicles involved, resulting in increased traffic volumes of between 0.6% on the M3 to 24.2% on the R161 between Trim and Doolistown, but will be temporary. The effect may be reduced to slight if the delivery of the large plant is done at night, as is proposed. The impacts will be negative and temporary lasting for 47 days.

During the 26 days of the Construction Stage 2 when the smaller sections of the blades and other smaller components for the turbines are delivered to the site by means of standard HGVs, the additional traffic generated will result in a negative impact on the surrounding road network, increasing traffic levels, ranging from 0.4% on the M3, to an increase of 14.6% on the R161 between Trim and Doolistown. The effect during this period will be negative will be temporary lasting for 26 days and will be slight.

An assessment of the potential impacts of the construction generated traffic was also undertaken at the Junction of the R161 / R156 just to the east of the site, as set out in section 14.1.5.1 and Table 14.25 of the EIAR. The results of the assessment show that additional trips passing through the junction on the busiest construction days will have a slight effect, increasing the maximum ratio of flow to capacity (RFC) at the junction for the traffic movements impacted from 4.5% to 12.3% in the AM peak hour (for traffic accessing the R156 from the R161), and from 9.0% to 17.1% during the PM peak hour (for the same movement). For the year 2026 scenario including construction traffic generated by the proposed development, the maximum RFCs for the AM and PM peak hours are 12.3% and 17.1% respectively, which are within the acceptable limit provided by TII of 85%.

It is noted that traffic impact assessment presented in Chapter 14 of the EIAR is based on the conservative assumption that all stone and aggregate required during the construction of the Proposed Development will be delivered to the site from external quarries. In practice it is proposed that as much material that is suitable will be won from the on-site borrow pits. This will significantly reduce the number of HGV trips generated during the construction phase.

Based on the above it is considered that a robust assessment of the traffic related impacts during the construction of the Proposed Development is presented in the EIAR.

Impact on integrity / and potential damage to already substandard carriageway

In the mitigation measures, as set out in Section 14.1.9.6 of the Traffic and Transport Chapter of the EIAR, it is stated that a Pre and Post Construction Road Condition Survey will be undertaken by the Applicant. A visual pre-condition survey of roads associated with the Proposed Development will be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A visual post construction survey will be carried out after works are completed. These surveys will include the capture of georeferenced imagery of the road surface. The pre- and post- condition images will be compared, and the required remediation or re-instatement works agreed with the local authority. Images of the post-remediation works will be provided to the local authority to confirm the work has been carried out to the satisfaction of their engineers. The timing of these surveys will be agreed with the local authority.

All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the Local Authority engineers.

Safety concerns in relation to the R156 and local school

The Boardsmill National School is situated on the north side of the R156 just to the west of the junction with the R161 in Doolistown. It is acknowledged that this section of the R156 and the Boardsmill National School is on the delivery route for the Proposed Development, and during the construction period traffic volumes will increase at this location by up to 20.5%.

With regards traffic safety on the R156 past the school, all HGV drivers will be required to obey the national rules of the road. Notwithstanding this, as set out in Section 14.1.9.6 of the EIAR a Traffic Management Co-ordinator will be appointed prior to and during the construction phase of the Proposed Development who will respond to all local concerns. Information relating to traffic management measures will be presented to members of the public and local schools via letter drops and meetings. While specific traffic management measures are not currently proposed for the school, further discussions on this subject will be held at these meetings prior to the commencement of the construction phase. One measure that may be considered would be to minimise the HGV deliveries made to and from the site at the start and end of the school day.

2.1.18 Noise and Vibration

A number of observations by third parties make reference to the potential environmental noise impact from the Proposed Development. These observations have been reviewed and response is provided below. This section has been prepared in consultation with AWN Consulting, to clarify, expand and reiterate previous statements within the submitted EIAR.

AWN is a multidisciplinary consultancy offering specialist design advice, expert witness and litigation support in respect of a wide range of engineering and environmental disciplines. AWN hosts Ireland's largest acoustic consultancy team with seventeen full-time consultants working in the field. The company has extensive experience in issues relating to wind farm noise having been involved numerous wind farm projects across the island of Ireland.

The primary issues raised in respect of the noise impact of the Proposed Development refer to the following topics:

- Mapping of Survey Location H125 and Status of Property;
- Window constructions of older buildings;
- Selection of noise measurement locations;
- Use of 2006 Guidelines for larger turbines;
- Noise Criteria do not protect rural properties from noise impacts
- Health effects, Low Frequency Noise and Infrasound;

- > Construction traffic Noise;
- > Vibration.

Comment in relation to the issues listed above is provided below.

Mapping of Survey Location H125 and Status of Property The residents at H125 write that they facilitated a background noise survey in the grounds of their house, but that the location of this noise survey is not correctly reported in the EIAR. Table 11.4 of the EIAR incorrectly reports the noise survey location to be H115 with coordinates E666,471 N759,713 whereas the correct house reference is H125, and the correct coordinates are E666,983, N759,576. The correct monitoring location is shown in Figure 3 below.

It is confirmed that the analysis of the data recorded at this location and presented in the Chapter 11 of the EIAR considered the correct noise survey position, shown as 'B' in Figure 3 below.



Figure 3. Noise Survey Location B at house H125

The residents at H125 make reference to the circumstances of the building itself as a protected structure in particular the age and height of the building and that this was not factored into the noise assessment. Noise predictions in the EIAR were made at 4m height above ground level for all locations as this is the calculation methodology recommended in the Institute of Acoustics (IOA) document entitled 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IOA, 2013). The methodology outlined in this guidance is used for the assessment of wind turbine noise and represents best practice i.e. No allowances are made in the calculation of the predicted noise levels for screening by trees or other vegetation etc.

Window Constructions of Older Buildings

The topic of the existing window construction particularly in older houses is mentioned in two observations.

It is important to note that the noise criteria outlined in the guidelines relates to outdoor noise levels. The assessment is therefore based on predicted noise levels external to the NSL and does not consider specific construction elements of a property e.g. windows. The external noise criteria set out in the guidelines considers a typical outdoor-to-indoor noise correction for a situation where a window is open. Due to the nature of the window being open, the construction of the window itself is deemed to have a negligible effect on this correction factor. The assessment method outlined in the guidance and applied in the EIAR is appropriate for all residential locations.

It is noteworthy, in relation to bedrooms, as stated in the EIAR, the Wind Energy Development Guidelines (2006) state the following on page 30:

“Separate noise limits should apply for day-time and for nighttime. During the night the protection of external amenity becomes less important and the emphasis should be on preventing sleep disturbance. A fixed limit of 43dB(A) will protect sleep inside properties during the night.”

As outlined in the EIAR the assessment did apply separate noise limits for day-time and nighttime periods.

Selection of measurement locations

A number of the observations refer to the fact that noise surveys were not carried out at every property and therefore Bord na Mona are guessing at the noise level impact and are not offering a real reflection of the likely scenarios.

As outlined in Section 11.1.2 of the EIAR, the noise impact assessment was carried out by competent experts from AWN Consulting Ltd. The noise impact assessment methodology is well-defined in the guidance documents presented in Section 11.3.2 of the EIAR and represents best practice in relation to the environmental noise impact assessment of wind farms.

The aforementioned IOA document ‘A Good Practice Guide the application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise’ states the following in section 2.2.4 in relation to the selection of noise monitoring locations:

“Background noise measurements should preferably be made in the vicinity of noise-sensitive receptors, principally houses (existing or for which planning consent is being sought / has been given) and any building used for long-term residential purposes (such as a nursing home). Where there are only a small number of isolated properties (perhaps 4-5) within the study area the selection process is simplified since it is practicable to make measurements close to all receptors. A common situation is where there are groups of houses and the objective is to identify, for each group, a ‘representative’ location within the curtilage of one property such that the background noise levels measured there can be reliably assigned to all other houses in the group.”

The seven noise measurement locations around the proposed development were selected in accordance with this guidance and are considered to be representative of the noise environment in their area. As stated in the EIAR, Section 11.4.4:

“An environmental noise survey was undertaken to determine typical background noise levels at representative NSLs surrounding the development site. The background noise survey was conducted through the installation of unattended sound level meters at seven representative locations in the surrounding area.

All measurement data collected during the background noise surveys has been carried out in accordance with the Institute to Acoustic’s Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IoA GPG, 2013) and accompanying, Supplementary Guidance Note 1: Data Collection (2014) discussed in the following Section.

The NSLs are spread over a large area and the noise monitoring locations were selected to obtain background noise levels representative of the noise environments at noise sensitive locations surrounding the site.”

In terms of assessing noise levels at other locations, the methodology is explained in Section 11.5.2 of the EIAR.

“A worst-case envelope, based on the lowest average levels at the various wind speeds for both day and night-time, is also presented in Table 11.13. Therefore, the noise criteria curves for this assessment will be based on this baseline noise level envelope for all NSLs where background noise measurement was not undertaken.”

Thus, for the purposes of this environmental noise assessment the lowest measured background noise levels are used to determine noise criteria at locations where noise surveys were not carried out. This is a conservative assessment methodology. At post-construction stage, a noise monitoring assessment will be undertaken to determine the turbine noise levels at selected NSLs to confirm compliance with the relevant planning conditions. If required for this assessment, the background noise levels will be confirmed at the NSLs selected for compliance monitoring.

Use of 2006 Wind Energy Development Guidelines for larger turbines

An observation was made referring to the fact that the 2006 guidelines are currently under review with a view to strengthen them to protect residents located in the area of the wind farms. In particular the concern raised was that guidelines which were derived in 2006 for wind turbines with a maximum blade tip height of approximately 50m could not reasonably apply to the turbines proposed which have a 200m blade tip height.

This issued was addressed in Section 11.3.2.2.6 of the EIAR:

“The original ETSU-R-97 concepts on which both the WEDG06⁷ and DRWEDG19⁸ are based underwent a thorough standardisation and modernisation in 2013 with the Institute of Acoustics publication of the A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise including 6 Supplementary Guidance Notes, all of which bring together the combined experience of acoustic consultants in the UK and Ireland in the application of these methods. Numerous improvements in the accuracy and robustness are described, in particular the treatment of wind shear and the general adaptation to larger wind turbines. The assessment in the EIAR is therefore in full accordance with the latest best-practice methods.”

Noise Criteria Do Not Protect Rural Properties From Noise Impacts

An observation was made stating that the criteria set out in Chapter 11, Noise and Vibration do not go far enough to protect rural residential dwellers from noise pollution and from loss of income from not being able to work from home, during the construction phase in particular.

The noise criteria derived using the methodology outlined in Section 11.3.2.1 of the EIAR for construction noise and section 11.3.2.2 of the EIAR for operational noise have been derived to protect residential amenity at noise-sensitive locations and are fully in line with current best practice.

Health Effects

⁷ Wind Energy Development Guidelines published by the Department of the Environment, Heritage and Local Government (2006)

⁸ Draft Revised Wind Energy Development Guidelines December (2019)

Section 2.1.8 of this report addresses in detail submissions received that raised concerns relating to potential human health impacts as a result of the proposed development.

However, a number of the submissions stated specific concerns in relation to effects on health due to noise from the proposed development. Section 11.4 of the EIAR addressed Human Health Impacts and discussed a number of studies into the potential health effects of wind farm noise including studies from Australia, Canada and the USA.

The relevant Australian authority on health issues, the National Health and Medical Research Council (NHMRC), conducted a comprehensive independent assessment of the scientific evidence on wind farms and human health, the findings of which were contained in the NHMRC Information Paper: Evidence on Wind Farms and Human Health 2015, which concluded: *“After careful consideration and deliberation, NHMRC concluded that there is no consistent evidence that wind farms cause adverse health effects in humans. This finding reflects the results and limitations of the direct evidence and also takes into account the relevant available parallel evidence on whether or not similar noise exposure from sources other than wind farms causes health effects”.*

The Australian Medical Association put out a position statement on Wind Farms and Health in 2014 which stated: *“The available Australian and international evidence does not support the view that the infrasound or low frequency sound generated by wind farms, as they are currently regulated in Australia, causes adverse health effects on populations residing in their vicinity. The infrasound and low frequency sound generated by modern wind farms in Australia is well below the level where known health effects occur, and there is no accepted physiological mechanism where subaudible infrasound could cause health effects.”*

Health Canada, Canada’s national health organisation, released preliminary results of a study into the effect of wind farms on human health in 2014. The study considered physical health measures that assessed stress levels using hair cortisol, blood pressure and resting heart rate, as well as measures of sleep quality. More than 4,000 hours of wind turbine noise measurements were collected and a total of 1,238 households participated. No evidence was found to support a link between exposure to wind turbine noise and any of the self reported illnesses. Additionally, the study’s results did not support a link between wind turbine noise and stress, or sleep quality (self-reported or measured). However, an association was found between increased levels of wind turbine noise and individuals reporting of being annoyed.

The review titled, Wind Turbines and Health: A Critical Review of the Scientific Literature was published in the Journal of Occupational and Environmental Medicine, 2014. An independent review of the literature was undertaken by the Department of Biological Engineering of the Massachusetts Institute of Technology (MIT). The review took into consideration health effects such as stress, annoyance and sleep disturbance, as well as other effects that have been raised in association with living close to wind turbines. The study found that: *“No clear or consistent association is seen between noise from wind turbines and any reported disease or other indicator of harm to human health.”*

In 2012, the New South Wales (NSW) Health Department provided written advice to the NSW Government that stated existing studies on wind farms and health issues had been examined and no known causal link could be established. NSW Health officials stated that fears that wind turbines make people sick are ‘not scientifically valid’. The officials wrote that there was no evidence for ‘wind turbine syndrome’, a collection of ailments including sleeplessness, headaches and high blood pressure that some people believe are caused by the noise of spinning blades.

In addition to the studies referenced above, the EIAR also contains a detailed review of studies relating to Infrasound, Low Frequency Noise and Amplitude Modulation in Section 11.4.2.1 and 11.4.2.2, respectively.

As a result of studies referenced above, Section 11.4.2.7 of the EIAR concluded that: *“The peer reviewed research outlined in the preceding sections supports that there are no negative health effects on people with long term exposure to wind turbine noise.”*

Low-frequency Noise and Infrasound

A couple of observations state concerns regarding infrasound and low-frequency noise, specifically stating that they were not addressed in the EIAR. As outlined in the preceding section, Infrasound and Low Frequency Noise are addressed in detail Chapter 11, Section 11.4.2.1 of the EIAR and the following paragraphs are taken from that section.

Low Frequency Noise is noise that is dominated by frequency components less than approximately 200Hz whereas Infrasound is typically described as sound at frequencies below 20Hz. In relation to Infrasound, the following extract from the EPA document Guidance Note for Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3) (EPA, 2011) is noted here:

“There is similarly no significant infrasound from wind turbines. Infrasound is high level sound at frequencies below 20 Hz. This was a prominent feature of passive yaw “downwind” turbines where the blades were positioned downwind of the tower which resulted in a characteristic “thump” as each blade passed through the wake caused by the turbine tower. With modern active yaw turbines (i.e. the blades are upwind of the tower and the turbine is turned to face into the wind by a wind direction sensor on the nacelle activating a yaw motor) this is no longer a significant feature.”

Further, the UK Institute of Acoustics Bulletin in March 2009 included a statement of agreement between acoustic consultants regularly employed on behalf of wind farm developers, and conversely acoustic consultants regularly employed on behalf of community groups campaigning against wind farm developments (IAO JS2009). The intent of the article was to promote consistent assessment practices, and to assist in restricting wind farm noise disputes to legitimate matters of concern. In relation to the issue of infrasound, the article states the following:

“Infrasound is the term generally used to describe sound at frequencies below 20 Hz. At separation distances from wind turbines which are typical of residential locations the levels of infrasound from wind turbines are well below the human perception level. Infrasound from wind turbines is often at levels below that of the noise generated by wind around buildings and other obstacles.

Sounds at frequencies from about 20 Hz to 200 Hz are conventionally referred to as low-frequency sounds. A report for the DTI in 2006 by Hayes McKenzie concluded that neither infrasound nor low frequency noise was a significant factor at the separation distances at which people lived. This was confirmed by a peer review by a number of consultants working in this field. We concur with this view.”

The article concludes that:

“from examination of reports of the studies referred to above, and other reports widely available on internet sites, we conclude that there is no robust evidence that low frequency noise (including ‘infrasound’) or ground-borne vibration from wind farms, generally has adverse effects on wind farm neighbours”.

Construction Traffic Noise at Site Entrances

An observation was made by two residents stating that their houses are 200m and 320m from two proposed site access junctions off the R156 and that they had concerns about the impact of noise and ground vibration during the construction phase.

Construction Traffic noise is assessed in Section 11.6.2.4 of the EIAR. It concludes that for the majority of locations, the increase in traffic noise levels is less than 2 dB. In certain locations, greater increases in traffic noise levels are expected, however the average noise level over a 12-hour working day remain within the criterion of 65 dB $L_{Aeq,12hr}$ at 10 m distance from the road edge. The effect of the traffic noise is therefore not considered significant.

Another resident also comments on concerns regarding traffic noise and vibration; however, review of the turbine delivery route confirms that construction traffic will not pass along the section of the R156 where the resident house is, which lies to the west of the site entrances.

The submitted noise impact assessment is independent, robust and has been carried out in line with current standards and best practice guidelines (i.e. Planning Guidelines for Wind Development 2006, ETSU-R-97 and Good Practice Guidelines). In addition to these guidelines, discussion has been provided in relation to matters such as Low frequency noise, Infrasound and noise related impacts on human health. The submitted EIAR Noise and Vibration assessment demonstrates that the Proposed Development can operate within the noise criteria derived from the relevant guidance and accordingly can be provided without significant effect on the amenities of any sensitive receptors.

Vibration

With regards to references to vibration impacts associated with the proposed development, the following response is provided.

The assessment concluded in Section 11.6.2.2 of the EIAR confirms that during the construction phase there are no likely significant effects from vibration at any NSL. Notwithstanding, section 11.3.2.1.3 of the EIAR identifies appropriate vibration limits for construction related activities.

For the operational phase of the proposed development there are no effects from vibration at any NSL. It is confirmed in Section 11.4.3 of the EIAR that at all NSLs vibration will be significantly below any thresholds of perceptibility and below baseline vibration levels.

2.1.19

Land Ownership

General Submissions on Land Title

A number of the submissions raised a query with regards to the ownership of the land relating to the proposed development. Bord na Móna confirm that they are either the registered owner of the lands, or the party entitled to be the registered owner, pursuant to dealings pending in the Property Registration Authority of Ireland (PRAI). Bord na Móna lawfully went into possession of the lands based on CPOs or on Deeds of Transfer / Conveyance as far back as the 1940's. However, the formal registration of the applicable lands with the PRAI was not advanced at that time and is being carried out now. Until such time as the dealings pending are complete the applicable lands will remain within the third-party folio.

Submissions received from DRB Community CLG and John Miggin listed folios which they determined are not currently owned by Bord na Móna and for which consent of usage is not evident in the application. Of the folios listed it is noteworthy that Folios MH19987F, MH18945 and MH18380 are entirely outside of the Bord na Móna Ownership boundary so are not relevant to the response included above. For the remaining folios it is important to note that Bord na Móna are only seeking to register the part of the folio (Plot) that they lawfully went into possession of and not all plans (lands) within that folio.

Submission Relating to Folio MH5079F

A submission relating to Folio MH5079F stated that “*Bord na Móna has wrongly outlined my land border, which needs to be rectified as their current mapping for this development is incorrect*”.

Folio MH5079F encompasses areas of agricultural land and bogland in the townland of Robinstown, Ballivor, Co. Meath. Bord na Móna can confirm that they went into possession of the area of bogland, known as Plots 229A and 229B being part of Folio MH5079F, and which form part of Ballivor Bog over 40 years ago. Bord na Móna went into possession based on a deed of transfer which was signed by

Michael McKeown in January 1978 upon payment of an agreed fee by Bord na Móna. Consequently, Bord na Móna are the party entitled to be the registered owner of the lands and an application to formalise the registration is pending in the PRAI.

2.1.20 Community Consultation

A number of third-party submissions have been made with respect to the level of community engagement/public consultation which was carried out by the applicant in the lead up to the planning application being lodged. It was suggested within observations received that not enough had been done in engaging with the local community. It should be reiterated that the applicant, throughout the design phase of the proposed development, placed a strong emphasis in engaging with the local community.

Broadly speaking the primary issues raised in respect of Community Engagement/Consultation can be summarised as follows and are addressed in the following sections:

- Lack of public meetings/ lack of engagement with the local community/Concerns raised not addressed;
- Impact of Covid 19 on community consultation;
- Facilitation of meeting with Killyon Community Development Association; and
- Hard copies of the application pack should have been issued to the local community

Lack of public meetings/ lack of engagement with the local community/Concerns raised not addressed

As outlined in Appendix 2-2 of the EIAR, Community Consultation was carried out in accordance with the following best practice Guidelines:

- Code of Practice for Wind Energy Development in Ireland - Guidelines for Community Engagement (DoCCAE, 2016);
- The Wind Energy Development Guidelines (DoEHLG, 2006);
- Preferred Draft Approach to Wind Energy Development in Ireland (DoCCAE and DoHPCLG, 2017); and
- The Draft Revised Wind Energy Guidelines (DoHPLG, 2019).

Section 2.2.1.7 of the submitted EIAR, along with the 'Community Report' appended as Appendix 2.2, details the comprehensive consultation and public participation which was carried out in respect of the proposed development. Engagement with the public, adjacent residents and local public representatives took place in many forms during the project design and preparation of the EIAR, as follows:

- A dedicated Community Liaison Officer (CLO) was appointed for the project. In addition, a dedicated project website, phone number, postal address and email address was set up to facilitate information transfer between the project team and the community. Since the project commenced in February 2020, these channels have facilitated 202 enquires about the proposed development.
- A first round of Community Information Sessions were held at three locations in the vicinity of the proposed development in March 2020 prior to the implementation of Covid Restrictions. Details of the sessions were advertised on public radio, in four local newspapers and local church newsletters. When Covid Restrictions eased somewhat in June 2020, the project CLO called to homes within a minimum of 1.5km of the proposed development (circa 600 homes) between 10th June - 3rd July to provide them with the information that was available at the first round of Community Information Sessions. The project information pack was distributed through letterboxes instead of being handed over in person on the doorstep due to the guidelines in place.
- A second round of Community Information Sessions were held in September 2020 when the project design had progressed to draft turbine layout stage. Due to the Covid-19 Pandemic and in line with Government Health Guidelines these sessions were held by appointment only in

Ballivor Community Centre and St. Patrick's Hall, Delvin. In advance of these Sessions, the project CLO visited homes within a minimum of 1.5km of the proposed development (circa 600 homes) to inform them of the Clinics and to provide them with the project pack containing updated information on the proposed development. These sessions were also advertised on public radio and in four local newspapers.

- In September 2021, the project CLO visited all homes within 2km of a turbine to deliver the final layout for the proposed development. The information pack included an A2 double-sided map to which depicted the proposed final turbine layout, substation location, internal road infrastructure and amenity pathways. The map also included distance bands out to 2km from a proposed turbine to enable members of the community identify the proximity of the nearest turbine to their residential property.
- Briefing Sessions for public representatives were held in advance of the Community Information Sessions.
- Eight 'one to one' house visits were requested and facilitated by the project team during the period from February 2020 to March 2023.
- As per the Code of Practice for Wind Energy Development in Ireland, (DoCCAE, 2016) all community groups local to the proposed development were provided with the same information provided to the public. Contact details were also provided if any of the groups wanted additional information on the project or requested a meeting with the project team to discuss the proposed development.

A summary of the key issues raised by the public is provided in Appendix 2-2 complete with a description of how the Community input into the design of the Proposed Development.

Impact of Covid 19

Bord na Móna acknowledge that the Covid-19 pandemic which commenced in March 2020 across the World, undoubtedly presented unprecedented challenges with respect to proactively engaging with local communities regarding projects, including the proposed Ballivor Wind Farm.

However, despite these challenges, Bord na Móna, always endeavoured to carry out consultations and engagements in a proactive manner that were both safe and risk-free for the health and wellbeing of all involved and, in full compliance with the Government's evolving Covid-19 restrictions that were being implemented across the country during this period.

Unfortunately, due to the prohibitive restrictions on public gatherings, Bord na Móna were not able to safely hold their standard format for the second round of Community Information Sessions in the locality. Despite these restrictions, the company nevertheless sought to inform, consult and engage with the community by utilising various other methods of communication as outlined in Appendix 2-2 of the EIAR – most notably through the appointment of a dedicated CLO resource for the project.

Over the course of the pre-planning phase for this project, the Community Liaison Officer (CLO) visited circa 600 homes at various stages (summarised above and outlined in Appendix 2-2 of the EIAR) to engage with residents on the proposed development. Where residents were not at home or unavailable, or, in some instances, due to Covid-19 restrictions the Community Liaison Officer was prohibited from knocking on residents' doors - contact details were provided including a direct mobile number for the CLO and dedicated email address for the project. As the company's main point of contact for the local community and vice versa, the CLO's role was to represent, communicate, consult and inform residents through regular updates via formal and informal meetings such as house calls, one to one meetings and clinics as further detailed in Appendix 2-2.

The frequency of these updates was somewhat impeded by the Covid-19 restrictions implemented across the country from March 2020 onwards. However, the CLO endeavoured to provide updates when available and in line with Government Guidance on Covid-19 and house visits.

As outlined above the Community Liaison Officer has visited circa 600 homes in the locality of the proposed development on several occasions to ensure they were kept informed about the project and provided opportunity for feedback and comments on the proposed development.

Facilitation of meeting with Killyon Community Development Association

Bord na Móna acknowledge that this meeting request and visit to Mountlucas Wind Farm was not fulfilled. Unfortunately, despite repeated attempts on both sides it was not possible to secure a date to meet that suited all parties involved due to scheduling conflicts. However, we are still available to meet this group and provide a tour of Mountlucas Wind Farm to discuss the proposed project should it be possible to secure a date and time that is suitable for all.

Hard copies of the application pack should have been issued to the local community

The planning application for Ballivor Wind Farm was lodged with An Bord Pleanála on 5th April 2023. One request was received on 17th May 2023 from a Community Group urgently requesting a hard copy of the planning application and associated documents.

Unfortunately, Bord na Móna were unable to provide a hard copy of the planning application and associated documents to local residents or interested groups. The Community Group was referred to the planning website for the project (www.ballivorwindfarmplanning.ie) which had been set up in order to facilitate people who are unable to access the information in hard copy format. All documents are available to view or download from that location as required.

The Group were also referred to the following locations where the application documents could be inspected during public opening hours for a period of seven weeks commencing on the 14th April 2023 at the following locations:

- The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1, D01 V902 (9:15am – 5:30pm, Monday – Friday);
- The Offices of Meath County Council, Buvinda House, Dublin Road, Navan, Co. Meath, C15 Y291 (9:00am – 5:00pm, Monday – Friday);
- Westmeath County Council, Aras An Chontae, Mount St, Mullingar, Co. Westmeath. (9:30am – 4:00pm, Monday – Friday).

2.1.21 Planning

Blade Tip Height and Scale of the Proposed Development and Compliance with the 2006 Wind Energy Guidelines

Issues were raised in the submissions regarding the scale of the development as being overbearing in the rural context of the proposed development site. Through an iterative process of project design, a range of best practice tools were employed to evaluate the landscape and visual effects of the proposed wind farm development. These tools, such as landscape modelling, ZTV mapping, and the creation of photomontage visualisations, were utilised to refine the optimal design for the Proposed Development in relation to landscape and visual aspects. Further details on these assessments can be found in Chapter 13 of the EIAR submitted with the application.

The final design of the Proposed Development, as well as the strategic placement of turbines within the landscape, was influenced by thorough impact assessment work conducted in 2020 and 2021. This work encompassed various aspects, including a Residential Visual Amenity Appraisal. The refinement of the turbine layout involved the removal of certain turbines from the project and a meticulous process of siting turbines to minimise the potential for significant landscape and visual impacts. Detailed descriptions of

the different iterations of the turbine layout that were part of this design process can be found in Chapter 3 – "Consideration of Reasonable Alternatives."

Observations were made in relation to the proposed development not being in compliance with the DoEHLG (2006) guidelines. Concerns were raised about the low-lying topography of the land and how the provision of wind turbines in this location goes against the aforementioned guidelines.

As outlined in the EIAR, the design of the proposed turbines have been guided by several policy guidance documents. The guidance for "flat peatland" in the DoEHLG (2006) guidelines is set out in the EIAR. This states that:

"Aesthetically tall turbines would be most appropriate. In any case, in terms of viability they are likely to be necessary given the relatively low wind speeds available. An even profile would be preferred."

Some submissions also contained concerns regarding the separation distances being achieved from residential receptors and questioned the scheme's compliance with the DoEHLG (2006) guidelines in this regard. The layout of 26 turbines has been designed to fully comply with the setback requirement of four times the tip height, as explicitly outlined for residential visual aesthetics in the Draft Revised WEDG's (Department of Housing, Planning and Local Government (DoHPLG), 2019). Further details on these can be found in Chapter 13 of the EIAR. Therefore the proposed development more than complies with the set back of 500 meters from residential receptors outlined in the 2006 Wind Energy Development Guidelines (WEDG's) for Planning Authorities (DoEHLG), 2006).

Compliance with Westmeath County Development Plan

Claims were made within a third-party submission that Westmeath has been classified as low capacity for wind energy development in the Westmeath County Development Plan. It is noted that the County Development Plan clearly states the following in relation to the provision of wind energy within its administrative boundary:

"In general, the Council will encourage wind energy, provided such developments would not have an adverse effect on residential amenities, tourism amenities, special landscape character, views or prospects, Natura 2000 sites, protected structures, aircraft flight paths or by reason of noise or visual impact."

The following is also stated in relation to the siting of wind energy developments:

"The preferred locations for large scale energy production, in the form of windfarms, is onto cutover cutaway peatlands in the County, subject to nature conservation and habitat protection requirements being fully addressed."

Further details on the suitability of the proposed development site for wind energy generation can be found in Section 13.1.4 of the EIAR.

Substitute Consent

Observations were made that consideration of the Proposed Development by An Bord Pleanála would be premature considering there is an ongoing application for substitute consent pertaining the site.

It is noted that the Applicant submitted a request for Leave to Apply for Substitute Consent to An Bord Pleanála in October 2021 and is currently awaiting a Decision on the Leave Application, which was initially due to be decided by 24th February 2022.

The Applicant has at all times followed the most appropriate planning process and will continue to do so going forward. It is Bord na Móna's intention to apply for Substitute Consent, however until a decision is made on the Leave Application, it is not possible to lodge an application for Substitute Consent.

Project Splitting

Some submissions contained claims that the development of the proposed Ballivor Wind Farm would constitute project splitting. These claims were raised as a result of the recently granted Bracklyn Wind Farm (ABP Ref: 311565), which is a 9 No. Turbine development, the live Knockanarragh Wind Farm application (ABP Ref: 314271) which relates to an application for the construction of 8 no. turbines.

Neither of these projects are being developed by Bord na Móna and therefore the proposed development of Ballivor Wind Farm cannot be considered as project splitting. Further, project splitting refers to the slicing up of a project in order to avoid the threshold requiring completion of an EIA. In this case an EIA has been carried out for the proposed development and is documented in the EIAR that accompanied the planning application. Hence the development does not constitute project splitting.

Where projects were consented or sufficiently advanced (i.e. information publicly available) they were addressed in the Cumulative Impact Assessment for the proposed development. Projects included in the Cumulative Impact Assessment are outlined in Chapter 2, Section 2.6 of the EIAR and are summarised above in Section 2.1.14 of this report.

Compliance with the Strategic Environmental Assessment Directive 2001/42/EC

As detailed in Section 2.2.3 of the Environmental Impact Assessment Report (EIAR), the proposed development underwent a thorough assessment against the County Development Plans of both Meath and Westmeath. These plans were formulated in accordance with the requirements of the SEA Directive, implying that their policies align with the Directive as well.

After a comprehensive analysis of the relevant policies and components within each development plan that pertained to the project, it has been demonstrated that the proposed development aligns with the pertinent policies of these plans. Consequently, it can be affirmed that the proposed development is consistent with the requirements of the SEA Directive.

Lack of Evidence that the Proposed Development Will Lower Carbon Emissions

One third party submission raised a concern that the EIAR does not contain evidence that the proposed development will lower CO₂ emissions. Chapter 10 of the EIAR states that, according to the calculations provided by the Bord na Móna model, a total of 384,030 tonnes of CO₂ will be released into the atmosphere due to alterations in the peat environment, shifts in the cycling of mid-merit gas-fired generation units, and the various stages of the construction, operation, and decommissioning of the Proposed Development. This amount constitutes a relatively minor portion of the overall CO₂ emissions that the Proposed Development is anticipated to counterbalance, as detailed in Table 10-16. Specifically, these emissions are projected to range from 6,035,010 tonnes to 8,717,237 tonnes of Carbon Dioxide (CO₂) over its lifetime (Relative to EU FFC). The volume of CO₂ emissions that will escape into the atmosphere will be compensated by the Proposed Development within 1.17 to 2.37 years of operation, contingent on the particular benchmark used for comparison. Further details on the calculation of carbon losses and savings can be found in Section 10.3.7.2 of the EIAR.

Ireland's "Overreliance" on Wind Energy Developments

Concerns were raised in some submissions regarding Ireland's perceived "overreliance" on wind energy developments. These submissions also raised concerns on whether alternative forms of renewable energy projects have been considered in place of the proposed development. Chapter 3 of the EIAR sets out the consideration of reasonable alternatives to the proposed development. Aside from wind energy developments, given the scale of the development, the only reasonable alternative form of energy generation would be a solar farm.

As outlined in Section 2.1.16 above, comparison of the potential environmental effects of the development of a solar PV array when compared against the chosen option of developing the proposed wind farm at this site were presented in Chapter 3, Table 3-4. In summary the table outlined that a solar development would have a higher potential environmental effect on Hydrology and Hydrogeology, would have potential for greater traffic volumes during construction phase due to the number of solar panels required to be delivered to achieve the same MW output, and would result in greater habitat loss at the site. It would also have potential to generate greater peat and spoil volumes and would increase the potential to impact on unknown subsurface archaeology. Furthermore, the capacity factor of solar PV is less than that of wind and therefore would result in a longer carbon payback period.

The rationale behind the preference for wind energy over solar energy is also elaborated in Chapter 2 of the EIAR, which outlines both the necessity for and advantages of the Proposed Development. Taking these factors into account, wind energy emerges as the most suitable option for generating renewable electricity at the site.

3. RESPONSE TO LOCAL AUTHORITY REPORTS

3.1 Meath County Council Recommendations

This section outlines the responses to the recommendations made by Meath County Council in section 7.7 of their Chief Executive's (CE) Report submitted to an Bord Pleanála on the 14th of June 2023. Meath County Council set out 7 no. recommendations in their CE Report which have been reproduced below and for which a response to each has been provided.

3.1.1 Recommendation 1: Cumulative Impacts on Archaeological, Architectural, Cultural Heritage, Landscape, EIAR & NIS

3.1.1.1 Recommendation 1 (a)

a) "The Planning Authority is making the applicant and ABP aware of other renewable energy applications in the west of Co. Meath, including solar farms (MCC Planning Ref: KA161206, KA161319, 22958, 21396) to be considered within An Bord Pleanála's cumulative assessment. The cumulative impact of the proposed development, operating windfarms, permitted windfarms (not yet constructed or operational) and other large infrastructure projects in the area should also be addressed in the landscape assessment and within the EIAR.

MCC were consulted regarding the scope of the EIAR for a proposed renewable energy development comprising 8 no. wind turbines within the townlands of Cavestown and Rosmead, Kilrush Lower, Newtown, Carnybrogan, Ballinlig, Kilrush Upper, Galboystown and Clonmellon in Co. Westmeath and Co. Meath as a medium-scale wind farm in an upland area of Counties Westmeath and Meath. The proposed wind turbines have a tip of 170m and a rotor diameter of 155m, capable of generating 52.8 MW of power and includes a 110 kV electricity substation, c.15 kilometres of site access tracks, etc."

3.1.1.2 Response to Recommendation 1 (a)

Section 2.1.1 of this document provides a summary of the methods and guidance used for the Landscape and Visual Impact Assessment reported in the EIAR LVIA. As detailed in Section 2.1.1 the EIAR, LVIA followed best practice methods as part of the assessment process. This assessment methodology follows the documented methods specified in guidance for LVIA, with most specific focus on the *Guidelines for Landscape and Visual Impact Assessment 3rd edition* (Landscape Institute & IEMA, 2013) also known as (and hereafter referred to as) the GLVIA3. The EIAR LVIA includes assessment of Cumulative Landscape and Visual Effects.

Cumulative Assessments in the EIAR LVIA

The following excerpt is from Section 13.6 of the EIAR LVIA and relates to the guidance used (*Assessing the Cumulative Impact of Onshore Wind Energy Developments* (Scottish Natural Heritage, 2012; & Nature Scot, 2021)) in the impact assessment process in relation to cumulative effects:

"The guidance document 'Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments' (Nature Scot, 2021) states the following in relation to cumulative landscape and visual impact assessment (CLVIA):

“The key principle for all impact assessments is to focus on the likely significant impacts and those which are likely to influence the outcome of the consenting process.”

“The assessment should be proportionate to the likely impacts and all CLVIA should accord with the guidelines within GLVIA3. The emphasis should be on the production of relevant and useful information, highlighting why the proposals assessed have been included and why others have been excluded, rather than the provision of a large volume of information”

In terms of cumulative landscape and visual effects and the quote above, other wind energy projects are of primary focus, as only these would be described as very tall vertical elements in the landscape and have greatest potential to give rise to significant cumulative effects.”

The recommendations by Meath County Council (1a to 1f) suggest a revised Landscape and Visual Impact Assessment is required to incorporate additional cumulative impact assessments. The cumulative assessments in the EIAR LVIA were proportionate and appropriate for the assessment of the proposed wind farm. In line with best practice guidance, the focus of the EIAR LVIA was to address the potential for significant cumulative landscape and visual effects. Cumulative effects with other wind farms are addressed in the EIAR LVIA as follows:

- Section 13.7.3.1.4 – *Cumulative Landscape Effects*
- Section 13.7.3.4 – *Cumulative Visual Effects; and*
- Cumulative visual effects are incorporated into the impact assessment tables in Appendix 13-2 and Appendix 13-3

In response to the recommendations by Meath County Council, discussion and analysis of cumulative interactions between the Proposed Development with ground level infrastructure such as permitted solar farms have been provided for in relation to the receptors identified. However, as is clearly evident from the responses and mapping below, these surface level developments have no potential for significant cumulative landscape and visual effects with the proposed Ballivor Wind Farm. Content from the EIAR LVIA and the impact assessments conducted is of upmost relevance to the responses included below, and various text and Sections from the EIAR LVIA - *Chapter 13* shall be referenced throughout. Chapter 12 of the EIAR - Archaeology and Cultural Heritage is also of relevance to the responses and shall also be referenced throughout.

Cumulative Landscape and Visual Impact Assessment of wind energy developments in the EIAR

The EIAR LVIA included a cumulative assessment of the Proposed Development in combination with all other existing, permitted and proposed wind farms within the LVIA Study Area (an area up to 25km from the nearest proposed turbine & 26.1km to the Hill of Tara). Section 13.6 – *Cumulative Context* identifies all of the existing permitted and proposed wind energy developments that were known in the public domain at the time of submitting the EIAR and Planning Application for the Proposed Development. All of these developments are included in the photomontages (Appendix 13-4 of the EIAR) and included in the visual impact assessments of each photomontage in Appendix 13-3 of the EIAR. These other wind energy developments also informed the impact assessments of designated Landscape Character Areas (LCAs) in Appendix 13-2 as well as general discussion of cumulative landscape effects of landscape receptors which are reported in Section 13.7.1.4 of Chapter 13. Discussion of cumulative visual impacts of the Proposed Development in combination with other existing, permitted and proposed wind energy developments are included in Section 13.7.3.4 of Chapter 13.

Cumulative Interactions with Solar Energy Developments

The assessment of cumulative landscape and visual impacts in the EIAR LVIA focussed on other wind energy developments as it is considered these are the development type most likely to give rise to significant effects. The following excerpt is from Section 13.6 of the EIAR LVIA and relates to the guidance used:

"In terms of cumulative landscape and visual effects and the quote above, other wind energy projects are of primary focus, as only these would be described as very tall vertical elements in the landscape and have greatest potential to give rise to significant cumulative effects."

Solar developments are ground based infrastructure and would have very limited visibility in such flat vegetated landscapes as the landscape of the LVIA Study Area. While undertaking the LVIA, a preliminary search of the landscape setting within 5km of the Proposed Development identified no existing, permitted or proposed solar developments. Considering the ground based nature of the solar developments and the limited capacity for long ranging visibility in the flat vegetated landscape type surrounding the Proposed Development, no cumulative search for solar developments was progressed past 5km from the proposed turbines. Whilst Solar energy is similar to Wind energy in the fact that it facilitates generation of renewable energy, from a landscape and visual perspective the development type (solar) would contribute the same potential cumulative landscape and visual impact as any other surface level infrastructure developments such as roads or housing in the wider landscape of the LVIA Study Area. The guidance for assessment of cumulative landscape and visual effects (quoted previously) should be proportional and should focus on potential for significant landscape and visual effects. In this regard it is not feasible to assess the landscape and visual interactions of the Proposed Development with all built infrastructure within a 25km radius, therefore solar was not included in the EIAR LVIA.

In response to the Planning Authority's recommendation to consider solar energy developments with the Proposed Development a planning search was conducted focussed on identification of existing, permitted and proposed solar developments in the full extent of the LVIA Study Area (to 25km). These developments are mapped in Figure 3.2.1.1-1 below with other wind energy developments, the ZTV map and the location of photomontage viewpoints. The map demonstrates the following:

- No operational solar farms currently exist in the LVIA Study Area (to 25km and 26.1km at Hill of Tara);
- 1 No. permitted solar development (Friarspark) is currently under construction to the south-west of Trim town, approximately 13.7km east of the nearest proposed turbine.
- 8 No. permitted solar developments were identified in the LVIA Study Area. The nearest one (Hilltown Solar Farm) is located approximately 8km north-east of the nearest proposed turbine.
- No 'proposed' solar developments are located in the LVIA Study Area.

As shown by the updated cumulative context map, most of the permitted solar farms identified are set back substantial distances (generally >10-15km) from the Proposed Development and many are located in areas where there is no theoretical visibility of the proposed turbines. Considering these set back distances, the nature of visibility of this development type in the flat midland landscape, and the likelihood of limited intervisibility indicated by the ZTV (as demonstrated in updated Cumulative Context Map), it is highly unlikely that any significant cumulative landscape and visual effects will arise from receptors in low lying areas of the LVIA Study Area.

Cumulative landscape and visual effects are only likely to be experienced from very elevated vantage points. This factor is considered and discussed in response to the specific elevated receptors identified by the planning authority (MCC) in their recommendations 1(b)-1(e).

When considering the location and orientation of views, the updated cumulative map shows that solar energy is only potentially visible in combination with the proposed turbines in seven of the

photomontages included in Appendix 13-4 (VP2, VP11, VP12, VP13, VP14, VP15 and VP19). All of these photomontages were reviewed and analysed with the new mapping, and it was determined that only one viewpoint (Viewpoint 19) (VP19 – See Below) has any potential for any cumulative in-combination visual effects with solar farms considering the distances and views available from these locations.

Under construction Friarspark Solar Farm not visible from VP19 due to screening from mature woodland along the 6 No. field boundaries in the intervening landscape between the solar farm and the urban fringe of Trim town.

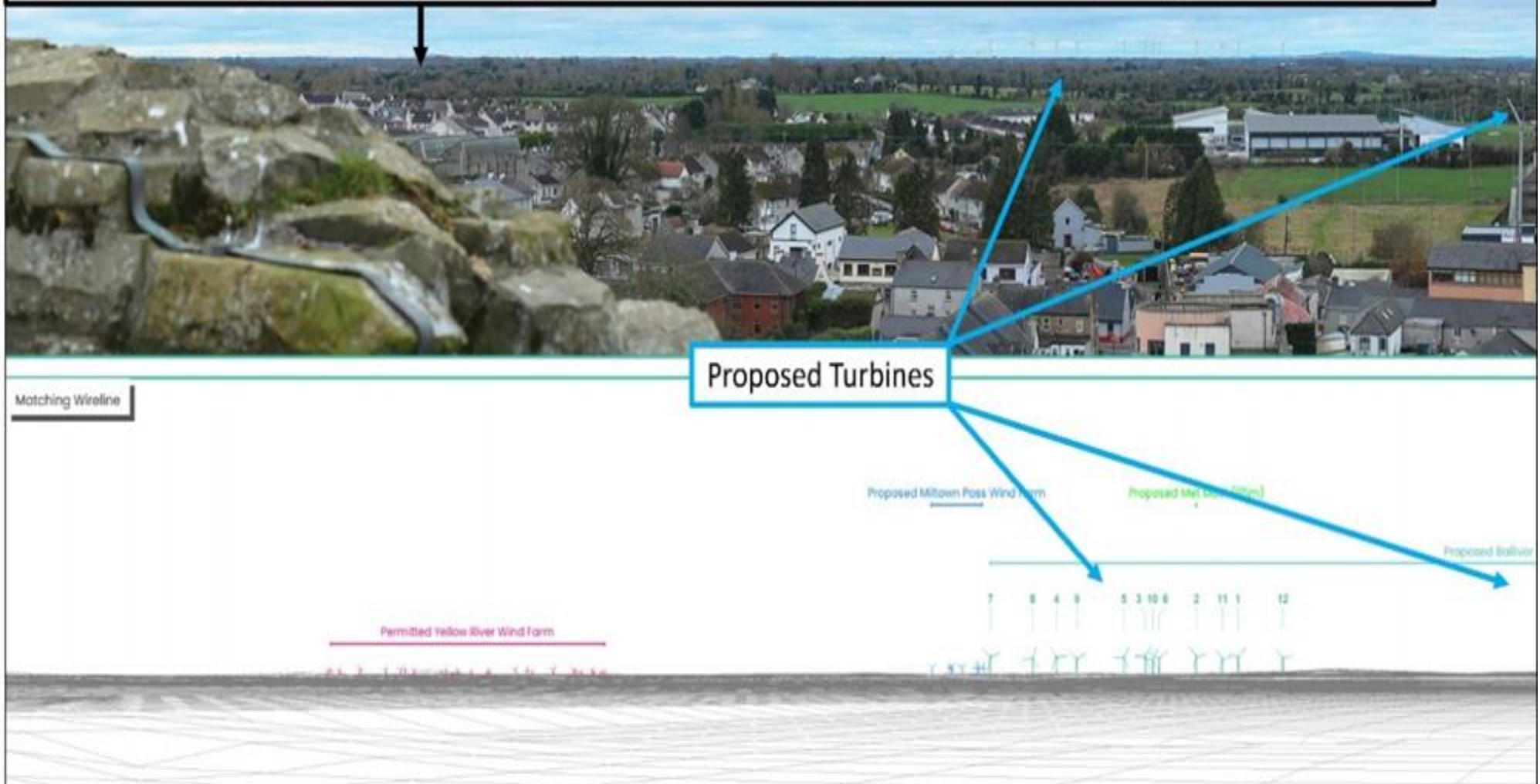


Figure 4. Viewpoint 19

VP19 – Trim Castle: Viewpoint 19 shows views from the most elevated ramparts of Trim Castle. An assessment of the proposed turbines from this location is included in Appendix 13-3 and summarised in the EIAR LVIA. The under construction Friarspark Solar Farm (including extension) is theoretically visible in combination with the proposed turbines within the field of view presented in Viewpoint 19 considering elevated nature and orientation of views from the viewpoint. Analysis of the layout of this solar farm and the photomontage determined that this solar farm will not be visible in the photomontage (or from Trim Castle ramparts when constructed). As demonstrated by the image above, visibility and potential for cumulative visual effects will not occur due to the surface level nature of solar development and dense screening from the mature treelines which form boundaries of 6 No. fields located between the solar farm and the urban fringe of Trim town.

Proposed Knockanarragh Wind Farm

The EIAR and Planning Application for the Proposed Development was submitted to An Bord Pleanála on the 5th of April 2023. At the time of submission, details regarding turbine coordinates or dimensions of the proposed Knockanarragh Wind Farm were not publicly available. As of the 2nd of August 2023, a pre-application consultation with the Bord has commenced for an 8-turbine wind farm (PC17.314271).

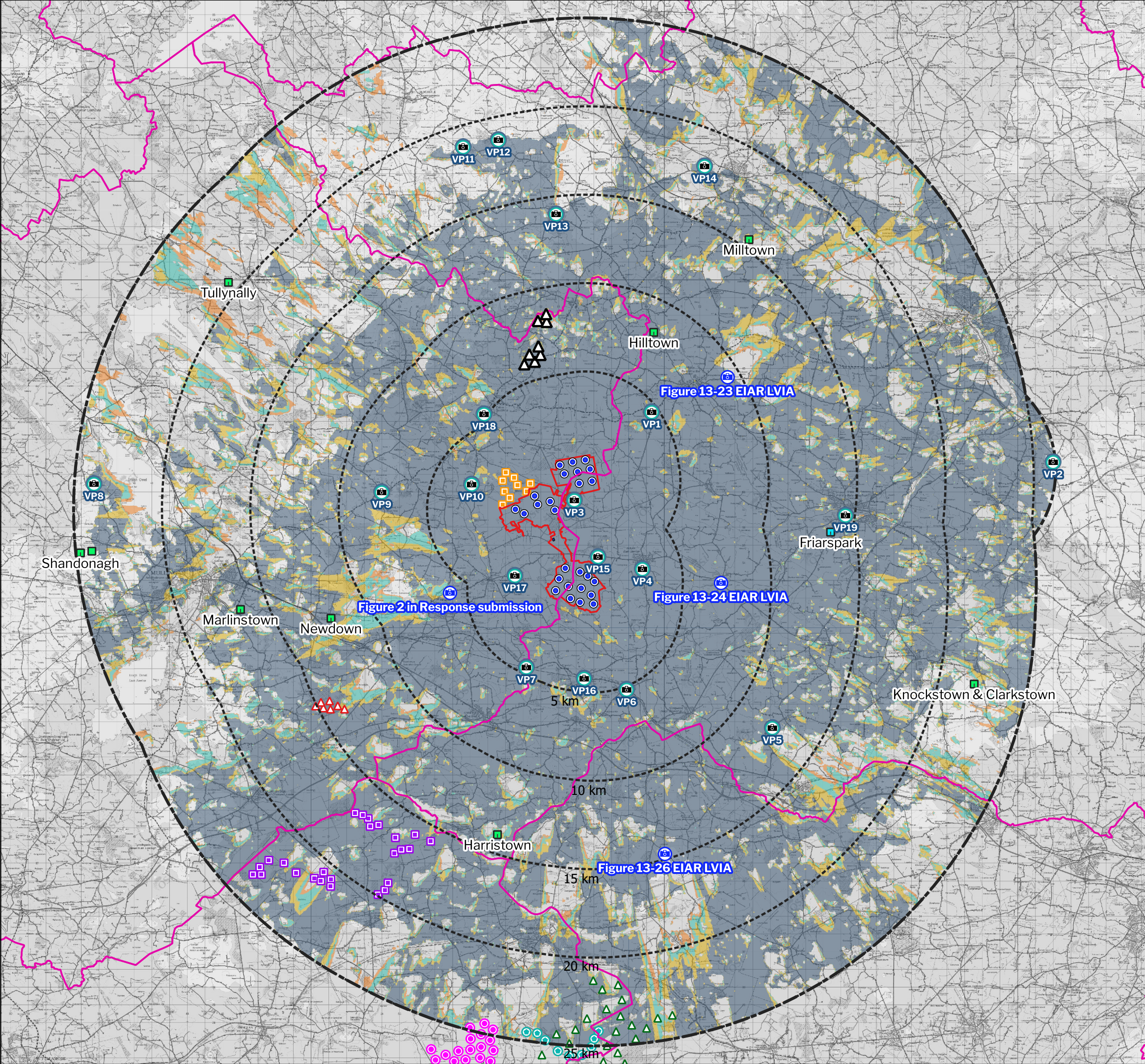
At the time of writing of the EIAR, the applicant acknowledged that there was a proposal to develop another wind farm to the north of the proposed Ballivor Wind Farm site but that no proposals were available for consideration. Section 13.6 of Chapter 13 of the EIAR states the following:

Section 13.6 of Chapter 13 of the EIAR states:

“An 8-turbine wind farm project called Knockanarragh is proposed approximately 8km north of the Proposed Development. It is located on lands, south-west of the Clonmellon Village and north-east of Devlin Village. Whilst this project is acknowledged, specific turbine dimensions are not known, nor is this project in pre-planning, therefore, this proposed wind farm is not included in cumulative photomontages or cumulative ZTV mapping.”

The project specifications of the proposed Knockanarragh wind farm, required to conduct a cumulative impact assessment (turbine layout and turbine size) using ZTVs and photomontages were not available in the public domain until after the EIAR was submitted for the Proposed Development. As detailed on the Bords website, a pre-application consultation was lodged/held on the 2nd of August 2023. This development now has a live website, and a turbine layout and turbine specifications were included in the project brochure which is dated Q3 2023 (August 2023).

In light of this information being recently available, and for consideration by the board, the proposed turbines of the Knockanarragh wind farm are included in Figure 5 below. For context, and in mind of the other request for information about cumulative impacts with solar farms, Figure 5 also includes turbines of the Proposed Ballivor Wind Farm Development, other cumulative wind and solar energy developments, the ZTV map and the location of photomontages included in the EIAR LVIA.



Map Legend

- Proposed Turbines
- Wind Farm Site Boundary
- LVIA Study Area
- County Boundaries
- Viewpoint Locations (EIAR Photomontage Booklet)
- Photowire (early stage Photomontage): No/Very Limited Visibility of the proposed turbines

Half Blade Zone of Theoretical Visibility (ZTV)

- 1 - 6 Turbines Theoretically Visible
- 7 - 13 Turbines Theoretically Visible
- 14 - 20 Turbines Theoretically Visible
- 21-26 Turbines Theoretically Visible

Updated Cumulative Context

- Recently Proposed Knockanarragh Turbines: Indicative turbine Layout

Solar Farms in the LVIA Study Area

- Permitted
- Proposed
- Under Construction

Cumulative Context Included in EIAR LVIA

- Existing Cloncreen Turbines
- Existing Cushaling/Cloncant Turbines
- Permitted Bracklyn Turbines
- Permitted Yellowriver Turbines
- Proposed Ballydermot Turbines
- Proposed Miltown Pass Turbines

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Drawing No.

Figure 5

Drawing Title

Cumulative Context Update

Project Title

Ballivor Wind Farm

Scale	Project No.	Date	Drawn By	Checked By
1:210,000	191137	31.08.2023	JW	KM

Planning and Environmental Consultants

The turbines of the proposed Knockanarragh project are located approximately 6km north of the nearest turbine of the proposed Ballivor Development. As shown by the photomontages (and photowires) and as demonstrated throughout the LVIA, visibility of the proposed turbines beyond distances of 5km is very limited in the flat vegetated landscape surrounding the Proposed Development, excepting from elevated vantage points. A discussion of likely cumulative effects on visual receptors is discussed below considering Viewpoints in proximity to both the proposed Knockanarragh wind farm and the Proposed Development, as well as from elevated vantage points in the LVIA Study Area where both the developments are likely to be viewed in combination:

- The N51 National Road is located between both developments (equidistant) and will have intermittent views of the proposed Ballivor turbines approximately 5km to the south as shown in Viewpoint 1 and Viewpoint 18. Minor cumulative visual effects may potentially occur on this receptor during a journey scenario when the proposed Knockanarragh turbines are seen from elevated vantage points along this route which permit open views in a northerly direction. Due to the set-back distances in multi-directional in combination visual effects (views of turbines in two separate directions from the one location) are less likely due to the nature of views from this route – as slightly long ranging views enabling visibility of the turbines are only available from slightly elevated vantage points between gaps in the vegetation.
- The proposed Ballivor turbines will potentially be viewed in combination with the proposed Knockanarragh turbines within long ranging views from very elevated vantage points in the LVIA Study Area. These will include views assessed in the EIAR such as Viewpoints 2; 8; 11; ;12; 13 and 14. The proposed Knockanarragh turbines would potentially contribute with the Proposed Development to the build-up of wind energy visible in the landscape from these viewpoints and some minor cumulative visual effects would potentially arise. However, it is key to note that in general, the setback distances from these elevated vantage points are substantial and the long ranging expansive landscape views are capable of absorbing these distant developments.

A review of the impacts of the proposed Ballivor turbines on highly sensitive elevated vantage points such as the Hill of Tara and Slieve na Calliagh Hills is considered in the response to recommendations 1(b), 1(c) and 1(d) below. These reviews consider and account for the recently proposed Knockanarragh project which now has project information available to the public. However, a key factor worth consideration of the Bord is that the proposed Knockanarragh project is at a very early stage in the project lifecycle and if it is submitted into planning, its construction and operation will be reliant on an outcome of the consenting process (if submitted for planning) and will be assessed independently as a project on its own merit as well as cumulatively. Therefore, there is a large degree of uncertainty as to whether potential cumulative visual effects with the Proposed Development will ever occur. Irrespective of this uncertainty, it is unlikely that significant cumulative landscape and visual effects will arise as a result of interactions between the Proposed Ballivor Wind Farm and the proposed Knockanarragh turbines.

Cumulative Impacts on NIS

Regards an updated cumulative impact for the NIS, solar developments and the Knockanarragh wind farm were considered. There are no proposed or operational solar developments within 5 km of the Proposed Development site. The permitted Friarspark solar development is currently under construction to the south-west of Trim town, approximately 13.7 km east of the nearest proposed turbine of the Proposed Development. The proposed Knockanarragh wind farm was also considered. Limited information on this proposed development was not available during the preparation of the EIAR, but it has now been included in the cumulative impact assessment in the NIS in this response document. This proposed development is located over 6 km from the closest turbine of the proposed Ballivor wind farm.

Having reviewed the solar developments and the Knockanarragh wind farm above and considering their distance to the proposed Ballivor wind farm, there is no change to the conclusion of the submitted NIS as no cumulative impacts have been identified.

Ornithology Cumulative Assessment

The habitats within the Knockanarragh Wind Farm (agricultural grassland and commercial forestry, as reviewed on publicly available aerial photography) are not a rare habitat locally nor are they habitats likely to be of importance to any of the identified key ornithological receptor at the Wind Farm Site. This limits the potential for significant cumulative impacts.

Given the lack of significant residual impacts on bird species associated with the Application Site when considered on its own, significant cumulative or in-combination effects on Key Ornithological Receptors with regard to direct habitat loss, displacement or collision mortality are not anticipated.

3.1.1.3 Recommendation 1 (b)

- b) *“It is the opinion of the Planning Authority that the proposed development could have a significant impact on the protected views from the Hill of Tara/Tara Complex which is included in Ireland's Tentative World Heritage List (as part of the Royal Sites of Ireland). It is recommended that An Bord Pleanála seek the advice of an independent World Heritage Expert, with specific expertise and experience in assessing World Heritage Site nominations on behalf of UNESCO, to assess whether the development could impact (either alone or in-combination with other developments) on any future nomination by the State Party to UNESCO for World Heritage Status using established international best practice.”*

3.1.1.4 Response to Recommendation 1 (b)

The response to Recommendation 1(b) is addressed under a number of different headings in the following Sections. As detailed in the impact assessments in the EIAR LVIA and Archaeology and Cultural Heritage (ACH) Chapter, no significant impacts are deemed to occur upon the landscape of Hill of Tara itself or the designated scenic views from the Hill of Tara however, this is revisited in the following sections.

No Significant Impacts on the Sites and Views at the Hill of Tara

Section 13.7.3.2.5 (Page 113-15) of the EIAR LVIA discusses visual effects on receptors in County Meath, including The Hill of Tara. This discussion was informed by a site visit, a verified photomontage (Viewpoint 2) and an assessment in Appendix 13-3 using established best practice methods for LVIA (GLVIA3). It is acknowledged that the Hill of Tara is a sensitive historic landscape with protected panoramic views, hence why it is given the highest sensitivity rating in the EIAR LVIA – ‘Very High’. The ‘magnitude of change’ was deemed to be ‘Negligible’ for the following reasons:

- The nearest proposed turbine is set back a distance of 26.1km west of the Hill of Tara. A distance greater than the standard study area radius recommended for LVIA and wind energy in the WEDGs (DoEHLG, 2006) and Draft WEDGs (DoHPLG, 2019), see Section 13.2.1 of Chapter 13 - *Scope and Definition of Landscape and Visual Impact (LVIA) Study Area*;
- The proposed turbines are visible in a location where wind energy is directed to in local planning policy and a landscape deemed to be of relatively low sensitivity and highly

- suitable for the development of wind energy (See Section 13.1.4 of Chapter 13, detailing why the cutover peatlands are a highly suitable landscape for a wind energy development);
- The proposed turbines are seen as very small features at a distance >26km. They are in the distant background of views and although there are many turbines, the two turbine clusters are well absorbed within an expansive flat plain and they are seen almost at the horizon.
 - The protected views at the Hill of Tara include 360° panoramic views. The proposed turbines collectively comprise approximately 3% (southern and northern clusters collectively comprise an 11° field of view) of the horizontal extent of these expansive panoramic vistas.
 - The proposed turbines are not sited in an area of the landscape that is the specific object of the designated scenic view, they are seen in area of the view which is typical of the flat rural landscape in this area of Ireland. The turbines do not obstruct or interfere with views of any other distinguishable feature of the landscape or any special landscape qualities and key sensitivities.

By virtue of the vast set back distance, small portion of the view, positioning in the landscape view, and lack of impact on the key scenic and special landscape characteristics or qualities, it is considered that it is considered that the proposed turbines are unlikely to fundamentally detract value from visitor and tourism experiences the Hill of Tara and heritage monuments within its historic landscape. In mind of all these factors, the magnitude of change to the views was deemed to be 'Negligible' in the EIAR LVIA. Therefore, following the impact assessment methodology, the residual significance of the visual impact was deemed to be 'Slight' and visual impacts are not deemed to be significant.

Updated Cumulative Assessment of the Hill of Tara

As shown by the updated cumulative context map, the Friarspark solar farm (currently under construction) is located between the Hill of Tara and the Proposed Development, southeast of Trim Town. This solar farm (and all other permitted ones identified in Figure 3.2.1.1-1) would not be identifiable in the landscape if modelled in the photomontage from Viewpoint 2. By virtue of its positioning southeast side of Trim town, its set back distance from the Hill of Tara (>13km), and the nature of the development as surface infrastructure, the Friarspark solar farm will not be visible in views from the Hill of Tara. Therefore, the solar energy developments identified in the Updated cumulative map will have no in-combination cumulative landscape and visual interactions with the Proposed Development from the Hill of Tara.

Turbines of the recently proposed Knockanarragh project are likely to be visible in combination with the Proposed Development from the Hill of Tara. The recently proposed Knockanarragh turbines would potentially be located approximately 29.5 km north-west of the Hill of Tara. The proposed Knockanarragh would potentially be viewed at similar scale and form as the proposed Ballivor turbines slightly to the right (north-west) within the field of view and there would be some visual separation, creating a third turbine cluster. These recently proposed Knockanarragh turbines would therefore have the potential to contribute to minor cumulative landscape and visual effects, as more turbines will be visible in the background of the view. However, for all the same reasons outlined in the section above - *'No Significant Impacts on the Sites and Views at the Hill of Tara'*, the landscape view is capable of absorbing both developments and will not result in any significant landscape and visual effects.

3.1.1.5 Recommendation 1(c)

- c) *"The visual and cultural heritage impact of the proposed development on the existing UNESCO World Heritage Site at Bru na Boinne and Tara Complex (as part of the Royal Sites of Ireland) requires further consideration. The Hill of Uisneach also part of the Royal Sites of Ireland (County Westmeath) and Dun Ailinne (County Kildare) require further assessment by An Bord Pleanála."*

3.1.1.6 Response to Recommendation 1 (c)

Section 13.4.1 (see page 13-36 and 13-37) of the EIAR LVIA considered many of the sites in County Meath mentioned in the recommendation above, and determined they are located beyond the LVIA Study Area and at such substantial distances where no significant impacts could potentially occur. The Proposed Development is located at considerable distances from all of these sites, beyond the EIAR LVIA Study Area, with the exception of the Tara Complex which was included at a distance of 26.1km. The relative distances of these sites from the Proposed Development are listed below:

- Brú na Bóinne: 37.5 km to nearest proposed turbine;
- Dún Ailinne: 46.6 km to nearest proposed turbine; and
- Hill of Uisneach: 33.2 km to nearest proposed turbine;

No significant impacts on these sites are likely to occur considering the limited visibility of the proposed turbines at these distances. As reported above, and in the EIAR LVIA 'Slight' visual impacts will occur at the Tara Complex which is set back 26.1km.

3.1.1.7 Recommendation 1(d)

- d) "Loughcrew and Slieve na Calliagh Hills are classified as having 'exceptional' value, of 'national/international importance' with a 'high sensitivity' to change. Slieve na Calliagh may be compromised due to the cumulative effects of the proposed wind turbines, other wind farm projects and other developments. The proposed development may therefore have a negative visual impact on the setting of Loughcrew Megalithic Cemetery which is contrary to HER POL 546 of the Meath County Development Plan 2021-2027."***

3.1.1.8 Response to Recommendation 1 (d)

The response to Recommendation 1(d) is addressed in the following section.

The likely impacts of the Proposed Development were assessed from Loughcrew and the Slieve na Calliagh Hills in the EIAR LVIA. Section 13.7.3.1.2 (Page 13-9) of the EIAR LVIA addresses the effects of the Proposed Development on the landscape of Loughcrew and Slieve na Calliagh Hills as follows:

"Loughcrew and Slieve Na Calliagh Hills is a landscape of exceptional value and high sensitivity on account of the cultural heritage value and relevant designations in the MCDP as previously reported in Section 13.4.1.2. The nearest proposed turbine is located approximately 18.7km from Loughcrew and Slieve Na Calliagh Hills. The Proposed Development will not alter the character, immediate setting and appearance of this landscape conservation area."

2 No. Photomontages (VP11 and VP12) were captured to assess views from the landscapes and visual receptors at Loughcrew and Slieve Na Calliagh. Viewpoint 11 was given a sensitivity rating of 'Very High', it was captured from the most elevated peak around Loughcrew Megalithic Cemetery and the most sensitive location where sites of cultural heritage are located and there are open views of the Proposed Development. The residual visual impact is deemed to be 'Moderate' for VP11. The detailed impact assessment of this viewpoint in Appendix 13-3 includes assessment of cumulative effects, stating:

"The photomontage shows open and clear views of the proposed development along with the permitted Bracklyn project. All 35 turbines (the 26 proposed Ballivor turbines along with 9 Bracklyn turbines) are visible and are visually indistinguishable as separate projects. The turbines read as one coherent cluster of similar turbine scales and minimal cluttering effects. The vast, open expanse of the view allows for the assimilation of the projects into the landscape..."

Cumulatively the projects read as one wind farm as both the permitted Bracklyn turbines are relatively contiguous to the Bord na Móna land bank and the proposed Ballivor turbines. The proposed Ballivor

turbines infill between both projects and add a significant number of additional turbines to that view. The assessment therefore needs to address all 35 turbines, which is completed below. Several other wind farms in the study area will be indiscernible along the skyline from this location due to distance across the flat landscape.”

The following factors were also stated (Appendix 13-3) in relation to visual effects from Viewpoint 11:

- *“Siting and design were developed in accordance with the guidelines (WEDGs) for flat peatland landscape character type and cumulative effects which outline “more than one wind energy development might be acceptable in the distant background provided it is only faintly visible under normal atmospheric conditions”*
- *Intervening distance (c 18.8 km)*
- *Designated scenic view description for V6 is of ‘panoramic views in all directions’ and is not directed primarily towards the proposed development*
- *Mature tree lines and hedgerows which form the rural landscape patterns are the intended focus of the view in the midground and background, therefore skyline views of the proposed development are restricted*
- *Coherent wind farm layout for both the proposed Ballivor and Bracklyn projects, cumulatively reading as one coherent project. Spatial extent of turbines in the view only slightly increased by proposed development”.*

For many of the same reasons reported above for the response to 1 (b) for the Hill Tara, by virtue of the vast set back distance, the positioning in the landscape view, and lack of impact on the key scenic and special landscape characteristics or qualities, it is considered that it is considered that the proposed turbines are unlikely to fundamentally detract value from visitor and tourism experiences of Loughcrew and heritage monuments within its historic landscape.

VP12 was captured from a high sensitivity viewpoint in the Slieve Na Calliagh hills to the east of VP11. The residual visual impact for this viewpoint is ‘Slight’. The detailed impact assessment of this viewpoint in Appendix 13-3 includes assessment of cumulative effects.

Loughcrew and Slieve na Calliagh Cumulative Update

The recently proposed Knockanarragh would potentially add turbines to views (VP11 and VP12) and would add to cumulative visual effects. These turbines would potentially be viewed in closer proximity to this receptor but within the same directional viewshed as the Proposed Development. It is highly likely that this recent proposal will be fully assessed in combination with the Proposed Development when a final design is established and an LVIA is produced as part of the planning application.

As shown on the updated cumulative context map the permitted Hilltown solar development is located approximately 15km south-east of Loughcrew. Analysis of the photomontages (VP11 and VP12) indicate that due to the set-back distances, nature of the undulating vegetated landscape and the ground based nature of solar developments, this development is unlikely to be visible from these landscape and will not contribute to cumulative landscape and visual effects on Loughcrew and Slieve na Calliagh in combination with the proposed turbines and other development.

3.1.1.9 Recommendation 1(e)

- e) *“It is recommended that An Bord Pleanála considers the need for a revised Landscape Visual Impact Assessment (LVIA) (including photomontages), taking account of the cumulative impact of the proposed development, other permitted and proposed developments including solar farms in the vicinity of the proposed development. The following Protected Views and Recorded Protected Structures (RPS) in the Meath County Development Plan 2021-2027, etc. in the immediate visibility context of the site and associated with the Boyne Valley and the World Heritage Sites should be included in the assessment. Additional prominent locations outside Co. Meath are also referenced:*

Protected Views	<ul style="list-style-type: none"> • 30- Hill of Slane- Panorama (north of Slane village) • 59- Panoramic views in all directions from top of Knowth tumulus. Extensive view across a working countryside (south-east of Slane village) • 87 a, b, c, d- Newgrange Passage Tomb- Panorama (south-east of Slane village) • 88- Dowth Passage Tomb- Panorama (south-east of Slane village) <p>Others include:</p> <ul style="list-style-type: none"> • 52- Hill of Ward- Panorama (east of Athboy and within the study area of the LVIA) • 47- Skryne Church- Panorama- of National Significance (east of the Hill of Tara) <p>Protected Views in the immediate vicinity of the site:</p> <ul style="list-style-type: none"> • 79- View to the north-east and south-west- View of Boyne Valley from Scarrif Bridge • 78 View north and south- View of Boyne Valley from Derrindaly Bridge).
RPS	<ul style="list-style-type: none"> • 91078 Woodtown House • 91193 Ballivor Health Centre • 91194 St Columbas RC graveyard • 91195 Saint Kineth's Church of Ireland Church • 91196 Saint Columbanus' Roman Catholic Church • 91197 Water Pump • 91198 Parkstown • 91292 Scarriff Bridge • 91388 Foxbrook • 91379 Killyon Manor which are within the visibility context of the development.
Other prominent sites in the area	<ul style="list-style-type: none"> • Bracklyn Estate (Co. Westmeath) is a demesne landscape located close to the west of the northern turbine cluster; and • Royal Canal c. 3.7km to the south of the site.”

3.1.1.10 Response to Recommendation 1e

The responses in relation to the receptors identified in the table above include reference to the EIAR LVIA and Chapter 12 of the EIAR - *Archaeology and Cultural Heritage* (hereafter referred to as the ACH Chapter). In most instances, these receptors have either already been assessed or were scoped out of assessment for well-reasoned factors. In all instances potential for cumulative effects with other existing,

permitted and proposed wind energy developments at the time of submitting the EIAR were accounted for in the assessment of receptors.

Both the EIAR LVIA and ACH Chapter utilise different study areas depending on the type and sensitivity of receptors under assessment. These study areas have been determined through reference to best practice guidance, as well as professional judgement and experience of the assessment teams. A rationale for the LVIA Study Area used in the EIAR LVIA is presented Section 13.2.1 of Chapter 13 and Appendix 13-1 – *LVIA Methodology*. A rationale for the various study areas use for assessment of different cultural heritage receptors is included in Section 12.2.5 of the ACH Chapter - *Methodology for the assessment of impacts on visual setting (indirect effects)*, with Table 12-1 detailing the different study area setback distances for assessment of receptors in relation to their relative sensitivity.

It is not possible to produce photomontages from every receptor (landscape, visual and cultural heritage) in the various study areas defined by the LVIA and ACH Chapters of the EIAR. It would be a disproportionate measure to include an individual photomontage from every receptor and this is not required to conduct a thorough and robust assessment of landscape and visual effects or indirect effects upon setting of heritage assets. In line with the guidance laid out in the GLVIA3 (LI & IEMA, 2013), the viewpoints selected for the LVIA and cultural heritage assessments conducted were informed by a range of factors including the “*ZTV analysis, by fieldwork, and by desk research*” (para 6.18, GLVIA 3, 2013). Furthermore, the GLVIA3 states that representative viewpoints are “*selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ*” (para 6.19 GLVIA 3, 2013).

At all times, the focus of the EIAR LVIA was to assess impacts on the most sensitive receptors where the greatest likelihood of significant effects will arise. It is also pertinent to note that when receptors were screened in for assessment in the LVIA, the assessments considered instances where cumulative impacts could potentially occur, and these assessments were conducted in line with best practice guidance - where there was a focus only on the greatest potential for effects without presenting large amount of unnecessary information, as stated by Nature Scot Guidance (2021) in relation to assessment of cumulative landscape and visual effects:

“The key principle for all impact assessments is to focus on the likely significant impacts and those which are likely to influence the outcome of the consenting process.”

“The assessment should be proportionate to the likely impacts and all CLVIA should accord with the guidelines within GLVIA3. The emphasis should be on the production of relevant and useful information, highlighting why the proposals assessed have been included and why others have been excluded, rather than the provision of a large volume of information”.

In the case of the EIAR LVIA, receptors are screened out of assessment during preliminary analysis where no effect is anticipated to occur, no photomontage is required and therefore no potential for cumulative effects can occur. For example:

- 71 No. Protected views are located in the LVIA Study Area. All are identified Table 13-3, in Section 7 in Section 13.4.1.2 of the EIAR LVIA. During a preliminary analysis (See – Table 13-7 in Section 13.5.1.1 -Designated Scenic Routes and Views, a vast majority of these were screened out from impact assessment (including production of photomontages) due to the factors mentioned in Table 13-7 and that no significant impact is likely to occur – refer to Section 13.5.2 – Visual Receptor Preliminary Analysis.

Protected Views

The study area set for the LVIA is detailed in Section 13.2.1 of the EIAR LVIA – *Scope and Definition of Landscape and Visual Impact (LVIA) Study Area*.

- “30- Hill of Slane- Panorama (north of Slane village)”: Receptor is not located within the LVIA Study Area and considering the setback distance of approximately 34km from the nearest proposed turbines, no significant effects are likely to occur.
- “59- Panoramic views in all directions from top of Knowth tumulus. Extensive view across a working countryside (south-east of Slane village)”: This receptor is not located within the LVIA Study Area and considering the setback distance of approximately 36.5km, from the nearest proposed turbine, no significant effects likely to occur.
- “87 a, b, c, d- Newgrange Passage Tomb- Panorama (south-east of Slane village)”: Receptor is not located within the LVIA Study Area and considering the setback distance of approximately 37.5 km from the nearest proposed turbine, no significant effects likely to occur.
- “88- Dowth Passage Tomb- Panorama (south-east of Slane village)”: Receptor is not located within the LVIA Study Area and considering the setback distance of approximately 39km from the nearest proposed turbine, no significant effects are likely to occur.
- “52- Hill of Ward- Panorama (east of Athboy and within the study area of the LVIA)”: This receptor was screened in, and an impact assessment is included in Pages 13-114 and 13-115 of the EIAR LVIA. Figure 13-23 in the EIAR LVIA shows a photowire (early-stage photomontage) captured from the peak of this hill. Due to dense vegetation screening in the direction of the proposed turbines, no significant cumulative visual effects are likely to occur considering the very limited visibility of the proposed turbines from this receptor.
- “47- Skryne Church- Panorama- of National Significance (east of the Hill of Tara)”: Receptor is not located within the LVIA Study Area and considering the distance of approximately 29.3 km from the nearest proposed turbine, no significant effects are likely to occur.

Assessment of Cumulative Effects on Designated Protected Views in the vicinity of the site as identified in recommendation 1(e)

The following response addresses the Protected Views in the immediate vicinity of the site namely View 79 (View to the north-east and south-west- View of Boyne Valley from Scarriff Bridge); and View 78 (View north and south- View of Boyne Valley from Derrindaly Bridge).

“Protected Views in the immediate vicinity of the site:

- 79- View to the north-east and south-west- View of Boyne Valley from Scarriff Bridge
- 78 View north and south- View of Boyne Valley from Derrindaly Bridge)”

Co. Meath Designated Scenic View 78 is identified in Table 13-3 and is illustrated in Figure 13-5 of Section 13.4 of the EIAR LVIA - *Landscape Baseline*. During the Visual Baseline exercise reported in Section 13.5 of the EIAR LVIA, scenic view 78 was screened out of assessment in Table 13-7, and then again in Table 13-12. As detailed in Table 13-7, the protected scenic amenity V-78 ‘view of the Boyne Valley from Derrindaly Bridge’ is located in an area of partial theoretical visibility and the designated scenic amenity is directed to the north and south from the bridge, not in the direction of the proposed turbines which are located to the west. Site visits determined that no visibility was likely to occur considering screening from landform and vegetation to the west of Derrindaly Bridge and the 10km set back distance, therefore this receptor was screened out from assessment. The location of this view combined with the flat nature of the surrounding landscape and distance to other developments (solar farms and wind farms), and no impact of the proposed turbines, it is concluded that there is no potential for visibility or cumulative interactions with the Proposed Development from Derrindaly Bridge.

V79 (Scarriff Bridge) was included in Table 13-3 and is screened in for assessment in Table 13-7 of the EIAR LVIA. Photomontage imagery was captured from this location and a photowire (Figure 13-24) was produced and is included in the impact assessment on Page 13-115. As shown in the photowire, no visibility occurs and therefore there is no potential for cumulative effects to occur.

As detailed in section 12.4.5.1 of Chapter 12, no world heritage sites or those on a tentative list are located within the proposed windfarm site or immediately adjacent to same. The nearest being Bru na Boinne which is located over 38km to the north-east and therefore no effects on setting will occur.

Protected Structures (RPS)

As detailed in section 12.3.1 of Chapter 12 Archaeology and Cultural Heritage, a standardised approach was utilised for the assessment of impacts of visual setting (indirect effects) according to types of monuments and cultural heritage assets which may have varying degrees of sensitivity. The assessment of impacts on visual setting was undertaken using both the Zone of Theoretical Visibility (ZTV) map in the Landscape and Visual Impact Assessment (LVIA), as presented in Chapter 13 of this EIAR, and also viewshed analysis from specific cultural heritage assets. In the absence of guidance and based on professional judgment, the study area of 10km was used for the viewshed analysis. The viewshed analysis used in the assessment of potential impacts on the visual setting of cultural heritage assets in the wider landscape of 10km considers the effects of the proposed turbines only. As detailed in Chapter 13 LVIA, the tall, vertical nature of the proposed turbines make them the most prominent elements of the Proposed Development from a landscape and visual perspective and have the most potential to give rise to significant landscape and visual effects. Other components of the Proposed Developments are not deemed to be as visually prominent as the proposed turbines. Other lower visibility infrastructure such as roads, substation, met masts etc. are not included in the viewshed analysis but are assessed without the use of viewshed analysis. While direct physical impacts to a site or monument can easily be assessed in quantitative terms, the assessment of impacts on setting can be subjective and as such is a matter of qualitative, professional judgement and experience. Due to the absence of policy on the assessment of visual impacts on cultural heritage, the distances below used in the assessment of impacts on setting are regarded as appropriate and are based on professional judgement and experience.

Table 3-1 Reproduced from Table 12-1 of Chapter 12 Archaeology and Cultural Heritage

Cultural Heritage Asset	Distance Considered
UNESCO World Heritage Sites (including tentative sites)	20km
National Monuments (State Ownership and Preservation Order Sites)	10km
Recorded Monuments, RPS	5km
NIAH structures	5km
Undesignated sites, if relevant	Within the EIAR boundary

The Protected Structures listed in the recommendation table 1(e) (above) are considered in Chapter 12 Archaeology and Cultural Heritage. Those outside of 5km such as *91292 Scarriff Bridge and 91388 Foxbrook* were scoped out due to their distance, their low-lying nature and their screening by intervening vegetation, buildings, topography and in the case of the latter, its orientation away from the Proposed Development. However, Scarriff Bridge was assessed for impacts during the construction phase as it is located along the proposed haul route. Please see section 12.3.3.5 and section 12.4.3.7.2 of Chapter 12 of the EIAR which concludes that there will be no impacts during the construction or decommissioning phases.

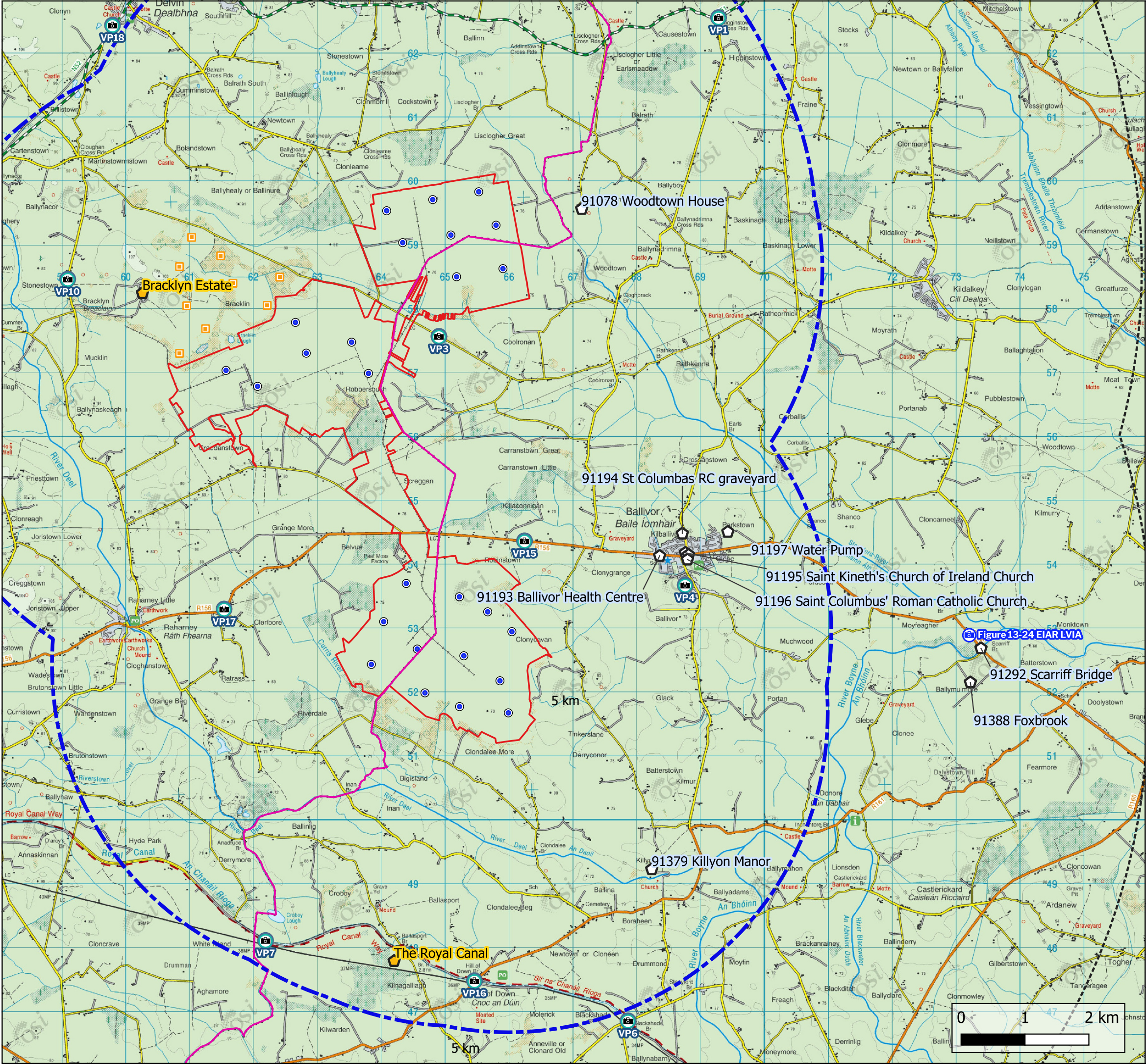
As demonstrated by the map in Figure 3.2.1-2 above, the following protected structures listed by Meath County Council are low lying and are located within the ‘urban’ setting of Ballivor.

- 91193 Ballivor Health Centre
- 91194 St Columbas RC graveyard
- 91195 Saint Kineth's Church of Ireland Church
- 91196 Saint Columbanus' Roman Catholic Church
- 91197 Water Pump

The urban setting of these receptors, the setback distance in such a flat landscape, and the dense vegetation of intervening field boundaries will largely restrict visibility of the proposed turbines from these Protected Structures. As such, no impacts are considered on their setting.

The remaining outlying structures in the open landscape may have some visibility in the direction of the proposed turbines as the ZTV suggests, such as 91198 Parkstown, 91078 Woodtown House and 91379 Killyon Manor. As detailed in section 12.4.5.7 of the Archaeology and Cultural Heritage Chapter, these outlier structures have been assessed as having a slight - moderate (Slight where intermittent visibility of turbines is possible and moderate where all or most of the turbines may be visible) residual effect on their setting.

“The impacts are considered to be slight - moderate (Slight where intermittent visibility of turbines is possible and moderate where all or most of the turbines may be visible).”



Map Legend

- Proposed Turbines
- Recorded Protected Structures identified in Recommendation 1(e)
- Other Prominent Sites RPS's - D1 - 2023.08.22
- Wind Farm Site Boundary
- 5km Study Area for Assessment of Recorded Protected Structures in Chapter 12 of the EIAR
- County Boundaries
- Viewpoint Locations (EIAR Photomontage Booklet)
- Photowire (Early Stage Photmontage): No Visibility

Updated Cumulative Context

- Recently Proposed Knockanarragh Turbines: Indicative turbine Layout

Solar Farms in the LVIA Study Area

- Permitted
- Proposed
- Under Construction

Cumulative Context Included in EIAR LVIA

- Existing Cloncreen Turbines
- Existing Cushaling/Cloncant Turbines
- Permitted Bracklyn Turbines
- Permitted Yellowriver Turbines
- Proposed Ballydermot Turbines
- Proposed Miltown Pass Turbines

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Drawing No.

Figure 6

Recorded Protected Structures - Cumulative Context Update

Project Title

Ballivor Wind Farm

Scale	Project No.	Date	Drawn By	Checked By
1:58,000	191137	22.08.2023	JW	KM



Assessment of Cumulative Impact on Protected Structures

As discussed in section 12.5.2.2, the immediate setting of the Protected Structures within 5km of the Proposed Development will not be negatively impacted although it is likely that there will be some visibility in the direction of the proposed turbines given the flat topography of the surrounding landscape. In this regard, a Slight-Moderate impact to their wider setting has been identified when the Ballivor turbines are considered alone. When considered cumulatively with other projects, in particular the permitted Bracklyn turbines situated adjacent to Ballivor within the 5km assessment zone, this impact may increase to Moderate given that more turbines are likely to be visible from such monuments. As the proposed Knockanarragh wind farm is located outside 5km study area and there are no proposed, permitted or operational solar farms within 5km, the residual effect on the setting of Protected Structures is considered the same- i.e. Moderate when all projects are considered cumulatively.

Photomontage imagery was captured from Protected Structure Scarriff Bridge and a photowire (Figure 13-24) was produced and is included in the impact assessment on Page 13-115 of the EIAR LVIA. The proposed turbines are not seen from Scarriff Bridge. Foxbrook is located in close proximity to V78 Scarriff Bridge, and it is highly unlikely that the turbines will be seen and impact upon the setting of this RPS. Therefore, no cumulative effects can occur.

Furthermore, Figure 6 above demonstrates that the list of Protected Structures above which are located in the village of Ballivor, along with Woodtown House and Killyon Manor are set back from any permitted solar farms and the recently proposed Knockanarragh turbines. Therefore, due to the large setback distances to other cumulative projects, no revised LVIA or photomontages are required from these receptors to account for cumulative effects.

Other Prominent Sites

The Table in recommendation 1(e) states the requirement for an updated impact assessment of the following receptors:

- *“Bracklyn Estate (Co. Westmeath) is a demesne landscape located close to the west of the northern turbine cluster”*
- *Royal Canal c. 3.7km to the south of the site.”*

Both Bracklyn Estate and The Royal Canal are comprehensively assessed in the EIAR LVIA with the aid of photomontages. Potential landscape effects of the Proposed Development on the landscape of Bracklyn Estate Demesne are assessed in Page 13-100 of the EIAR LVIA. Potential cumulative visual effects with the permitted Bracklyn Wind Farm are assessed with the aid of Photomontage Viewpoint 10 which is located in very close proximity to Bracklyn Demesne. Cumulative visual effects with the permitted Bracklyn Wind Farm are addressed in the visual impact assessment table in Appendix 13-3 (Viewpoint 10) and are also discussed further in Section 13.7.3.4 – *Cumulative Visual Effects*. Considering the setback distance of this landscape from solar farms and the recently proposed Knockanarragh turbines, as well as the flat and vegetated nature of the intervening landscape no cumulative effects are likely to occur.

The Royal Canal is assessed with the aid of three photomontages – VP6, VP7 and VP16, the effects are discussed in the EIAR LVIA, and cumulative effects are accounted for in the assessment of photomontages in Appendix 13-3. No significant visual effects are deemed to arise from receptors such as bridges and walking trails alongside the canal. Considering the setback distance of this receptor from solar farms and the recently proposed Knockanarragh turbines, as well as the flat and vegetated nature of the intervening landscape no cumulative effects are likely to occur.

Bracklyn Estate is assessed in Chapter 12 Archaeology and Cultural Heritage in section 12.4.5.5 *Recorded monuments within 5km of the nearest proposed Turbine (Indirect Effects on setting)* and section 12.4.5.6

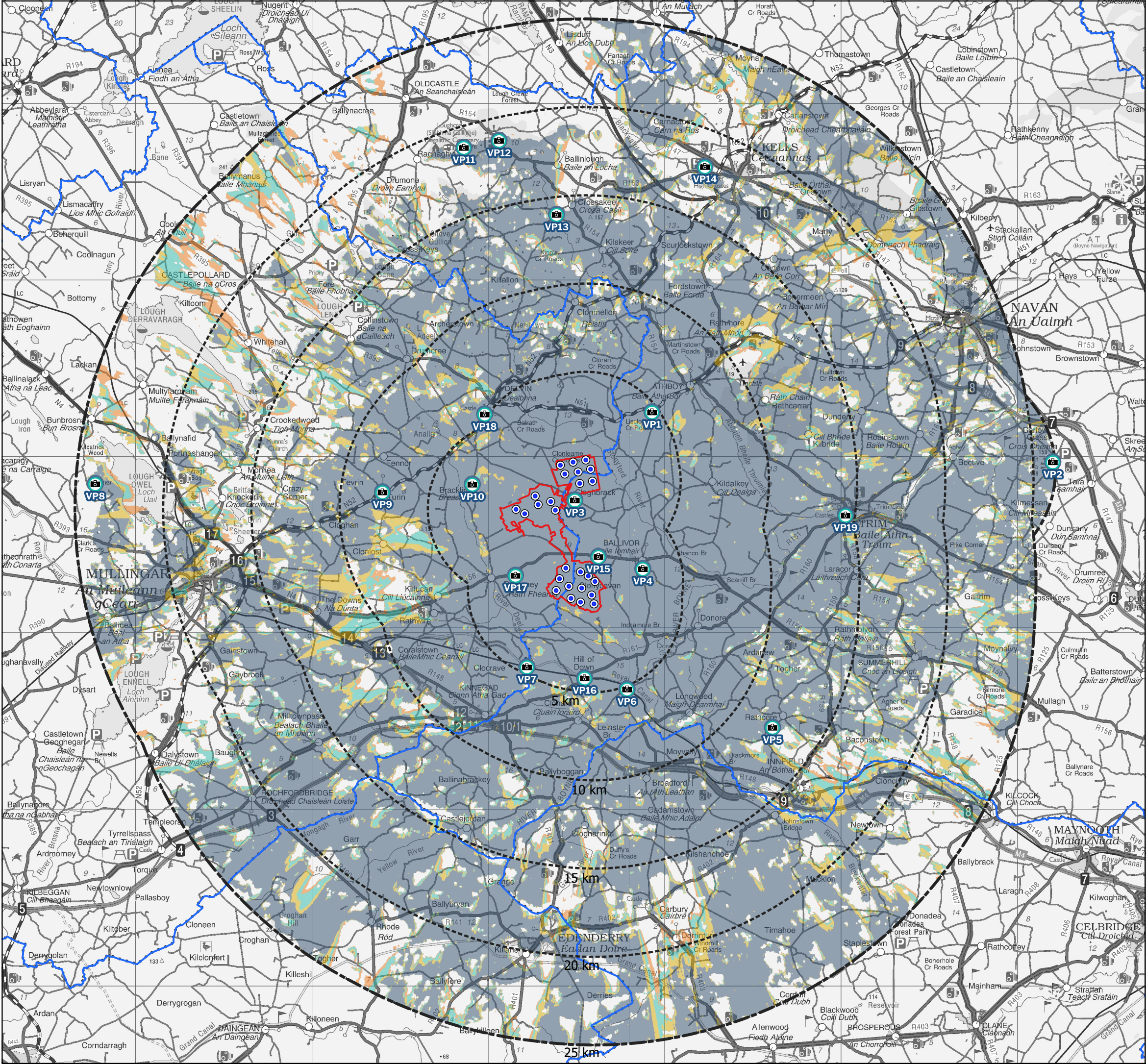
Protected Structures and structures listed in the NIAH within the Wind Farm Site Boundary (Indirect Effects on setting).

As detailed, the Bracklyn Estate recorded monuments are located in private agricultural land with no public access. These monuments are included in the assessment to ascertain the potential effects on setting in the wider landscape setting of the Proposed Development by using ZTV and GIS mapping analysis to ascertain the likely effects on setting. The ZTV included in Chapter 12 shows that monuments within the 5km study area are located in areas where 21 – 26 turbines may be visible. In reality, existing screening and buildings (which the ZTV does not take into consideration in its calculations) is likely to alleviate if not remove the potential impacts altogether. The ability to view turbines from monuments does not mean that either the monument or its immediate setting will be significantly negatively altered. Where turbines are visible, it will result in a landscape change which is considered to be slight-moderate. When considered with other permitted and proposed development such as the permitted Bracklyn turbines Likewise, as detailed in section 12.5.2.2, when considered cumulatively with Bracklyn turbines, this impact may increase to Moderate. As the proposed Knockanarragh Wind farm and permitted and proposed solar farms are located outside the 5km study area, when considered cumulatively, the impact on the setting of Bracklyn Estate is considered the same.

- f) *“It is noted that colour-coding relating to theoretical visibility of turbines at different distances has not been presented at 13-1 as stated in Section 13.3.2. This should be requested from the applicant.”***

Response to Recommendation 1 (f)

Due to a digital malfunction, the colours of the Zone of Theoretical Visibility (ZTV) were absent in the ZTV map – Figure 13-1 of the EIAR which is reinserted below. The Applicant has reproduced this map below with the ZTV colours included.



Map Legend

- Proposed Turbines
- Wind Farm Site Boundary
- LVIA Study Area
- County Boundaries

Half Blade ZTV

- 1-6 Turbines Theoretically Visible
- 7-13 Turbines Theoretically Visible
- 14-20 Turbines Theoretically Visible
- 21-26 Turbines Theoretically Visible

Photomontage Viewpoint Locations
Volume 2 Photomontage Booklet

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O

Drawing No.

Figure 13-1

Drawing Title

Half Blade ZTV Map

Project Title

Ballivor Wind Farm

Scale: 1:210,000

Project No.: 191137

Date: 23.02.2023

Drawn By: JW

Checked By: KM

MKO

Planning and Environmental Consultants

3.1.2 Recommendation 2: Noise, Vibration & Shadow Flicker

3.1.2.1 Recommendation 2(a)

“The Environment (General) Department of Meath County Council in relation to noise, states that ‘the potential for generation of low frequency noise 20–200 Hz is a risk as such the applicant should be required to fully investigate the potential for low frequency noise on noise sensitive receptors within the area of the development and proposals for mitigation of same’. An Bord Pleanála are requested to consider this matter and where it considers appropriate, seek further information in this regard.”

3.1.2.2 Response to Recommendation 2(a)

This response to recommendation 2(a) has been prepared in consultation with AWN

Low-frequency noise

Low-frequency noise is addressed in section 11.4.2.1 of the EIAR and has also addressed in Section 2.1.18 of this report. Research is presented showing that these low-frequency noise and infrasound are not typically perceptible at noise-sensitive locations in the vicinity of wind farms nor do they give rise to adverse physiological or psychological effects.

Use of the Draft Revised Wind Energy Development Guidelines

In the Recommended Conditions set out by Meath County Council in their CE Report, reference is made to the Draft Revised Wind Energy Guidelines for the operational phase:

Condition (j): During the construction phase noise levels at noise sensitive locations shall not exceed 70dB(A) between 0700 to 1900 hours Monday to Friday and 0800 to 1400 hours Saturday and 45dB(A) at any other time. Noise exceedance activities must be agreed in writing with Meath County Council prior to taking place. For the operational phase the applicant should be required to assess the potential impact of the special audible characteristics and noise limits associated with development on NSR’s as reference in the DRAFT revised Wind Energy Development Guidelines 2019.

The noise impact assessment in the EIAR references the current Wind Energy Development Guidelines from 2006 as these are currently the only adopted guidance in place. As outlined in Section 11.3.2.2.6 of the EIAR, which discussed Future Potential Guidance Change the 2006 Guidelines were issued by the Minister pursuant to section 28 of the Planning and Development Act 2000 (as amended) (‘the 2000 Act’) which, so far as relevant, provides that:

“(1) The Minister may, at any time, issue guidelines to planning authorities regarding any of their functions under this Act and planning authorities shall have regard to those guidelines in the performance of their functions ... (2) Where applicable, the Board shall have regard to any guidelines issued to planning authorities under subsection (1) in the performance of its functions.”

Section 143 of the 2000 Act further provides that: –

“(1) The Board shall, in performing its functions, have regard to – (a) the policies and objectives for the time being of the Government, a State authority, the Minister, planning authorities and any other body which is a public authority whose functions have, or may have, a bearing on the proper planning sustainable development of cities, towns or other areas, whether urban or rural.

The 2006 Guidelines are accordingly the guidelines that must be considered, and not any drafts. As per the High Court decision in *Element Power Ireland Ltd v An Bord Pleanála* (2017) nothing in the planning legislation authorises the planning authorities to take into account drafts, or the prospect of new or modified government or local authority policy or objectives.

Without prejudice to that background, in December 2019, the Draft Revised Wind Energy Development Guidelines December 2019 (DRWEDG19) were published for consultation and have yet to be finalised. It is important to note that as part of the public consultation a number of concerns in relation to the proposed approach have been expressed by various parties and it is the opinion of the authors of this assessment that the DRWEDG19 document does not outline a best practice approach in terms of the assessment of wind turbine noise. Specific concerns expressed by a cross party group of interested professionals can be reviewed at: <https://www.ioa.org.uk/wind-energy-development-guidelines-wedg-consultation-irish-department-housing-planning-community>

and the following statement is of note from the above document:

"a number of acousticians working in the field have raised serious concerns over the significant amount of technical errors, ambiguities and inconsistencies in the content of the draft WEDG and these were highlighted during the consultation process by a group of acousticians."

Therefore, in line with best practice, which includes ESTU and IoA methodologies as described, in EIAR Chapter 11, the assessment presented in the EIAR is based on the current best practice guidance outlined in Section 5.6 of the Wind Energy Development Guidelines for Planning Authorities, 2006.

The EIAR goes on to say:

The original ETSU-R-97 concepts on which both the WEDG06 and DRWEDG19 are based underwent a thorough standardisation and modernisation in 2013 with the Institute of Acoustics publication of the A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise including 6 Supplementary Guidance Notes, all of which bring together the combined experience of acoustic consultants in the UK and Ireland in the application of these methods. Numerous improvements in the accuracy and robustness are described, in particular the treatment of wind shear and the general adaptation to larger wind turbines. The assessment in the EIAR is therefore in full accordance with the latest best-practice methods.

In the event that updated Wind Energy Guidelines are published during the application process for the Proposed Development it is anticipated that any relevant changes affecting the noise (if any) will be addressed through an appropriate planning condition, or where a supplementary assessment is necessary, through provision of additional information. Therefore, as the Draft Guidelines have not been approved or finalised, the EIAR correctly assessed the proposed development using the 2006 guidelines.

The submitted noise impact assessment is independent, robust and has been carried out in line with current standards and best practice guidelines (i.e., Planning Guidelines for Wind Development 2006, ETSU-R-97 and Good Practice Guidelines). In addition to these guidelines, discussion has been provided in relation to matters such as Low frequency noise, Infrasound and noise related impacts on human health. The submitted EIAR Noise and Vibration assessment demonstrates that the Proposed Development can operate within the noise criteria derived from the relevant guidance and accordingly can be provided without significant effect on the amenities of any sensitive receptors..

3.1.2.3 Recommendation 2(b)

"217 dwellings are within 1.7 km of the turbine locations. Using a Windfarm software package, the applicant has submitted that the daily threshold of over 30 minutes' shadow flicker may potentially be exceeded at 80 properties, and the annual threshold of over 30 hours for shadow flicker is predicted to be exceeded at 12 properties once the regional sunshine average factor has been considered. An Bord Pleanála are requested to consider the impact of shadow flicker of the proposed development on the

residences in the vicinity of the development; and where it considers appropriate, seek further information in this regard.”

3.1.2.4 **Response to Recommendation 2(b)**

As discussed above in section 2.1.6, and stated in Chapter 5 Population and Human Health, the properties listed as having the potential for shadow flicker exceedances, above the 2006 WEGs thresholds, will be surveyed at the commencement of the operation phase to determine if shadow flicker actually occurs at these properties, bearing in mind the conservative approach the software takes when predicting shadow flicker. The surveys will also assess the degree of existing screening and window orientation of each potentially affected property.

The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties. If it is found that shadow flicker exceedances do occur, screening proposals will be investigated and discussed with the residents of each property that may be impacted. If a screening solution cannot be found, wind turbine control measures will be implemented. Details on the wind turbine SCADA technology which allows for turbine shut down during periods where shadow flicker can occur is discussed in the EIAR and in Section 2.1.6 of this report. As outlined, this technology can be used to bring turbine(s) in line with the adopted 2006 WEG guidelines, where required. Should the draft 2019 WEGs or planned 2024 WEGs come into effect before a planning decision is made on this development, the SCADA technology can be used to bring the wind turbines in line with the shadow flicker recommendations set out in the 2019 or 2024 WEGs,

3.1.3 **Recommendation 3: Biodiversity/Ornithology**

3.1.3.1 **Recommendation 3(a)**

“An Bord Pleanála is requested to invite the applicant to submit details regarding lighting at the proposed development and in particular, address the impact of the same on birds/bats, etc. This should include aviation lights on wind turbines, substation compound lighting proposals, etc. All lighting should be directed inward to the development, avoiding spill/glare into the surrounding environment. Further consideration to lighting may need to be given by An Bord Pleanála in its NIS/EIAR. Section 6.1.2 of Appendix 6-2 Bat Survey Assessment refers to guidance in relation to the use of lighting.”

3.1.3.2 **Response to Recommendation 3(a)**

This section provides a response in relation to bats. The response regards potential impacts on birds is provided in Section 2.1.4 of this document.

In response, it is noted that bat surveys were undertaken during the 2020 and 2022 bat survey seasons to inform the EIAR. During all the surveys undertaken, whilst high levels of bat activity were recorded during the walked transects, no significant loss of commuting, foraging or roosting habitat is anticipated. In addition, it is noted that surveys at height were undertaken in 2020 and recorded significantly lower levels of activity at height (as evidenced in Appendix 3 of Appendix 6-2 of the submitted EIAR). As such, the lack of significant impacts predicted at ground level and the significantly lower levels of activity recorded at height, the potential for the aviation lighting to result in any significant effect on bat species can be excluded.

In relation to lighting associated with the proposed wind farm, besides aviation lights on the turbines, the only permanent lighting is associated with the substation and will be very small scale and rarely used and any lighting that may be required during construction will be temporary in nature and most likely during

the winter months when works may begin or end in darkness. Whilst the implementation of any such lighting does not have the potential to result in any significant impacts on biodiversity without any form of mitigation, it is still proposed to ensure that the measures that are set out in Section 6.1.2 of Appendix 6-2 of the EIAR are implemented. These include the use of directional lighting to avoid any illumination of any ecologically sensitive areas such as woodland edge or forestry habitat. In addition, Bord na Móna commit to the use of a lights during construction, operation and decommissioning (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:

- Every light needs to be justifiable;
- Limit the use of light to when it is needed;
- Direct the light to where it is needed;
- Reduce the light intensity to the minimum needed 5. Use light spectra adapted to the environment;
- When using white light, use sources with a “warm” colour temperature (less than 3000K).

In addition, Bord na Móna commit to avoiding the long-term use of LED lighting at the Ballivor Wind Farm.

In conclusion, the proposed lighting associated with the Ballivor Wind Farm will be small scale in nature and has been specifically designed to avoid effects on biodiversity during construction, operation and decommissioning. There is no potential for the proposed lighting either individually or cumulatively to result in any significant effect of biodiversity during any stage of the project lifetime.

3.1.3.3 Recommendation 3(b)

“The sighted locations of Kingfisher are within and surrounding the site. Turbine no. 21 is in the flight line of one incidental sighting (according to Figure 4-4d). An Bord Pleanála is requested to consider this matter in the context of potential impact on the Kingfisher.”

3.1.3.4 Response to Recommendation 3b

A number of submissions raised concerns regarding kingfisher with regard to foraging, nesting, habitat loss and collision risk. Additionally, Meath County Council (MCC) commented:

“The sighted location of Kingfisher are within and surrounding the site. Turbine no. 21 is in the flightline of one incidental sighting (according to Figure 4-4d). An Bord Pleanála is requested to consider this matter in the context of potential impact on the Kingfisher.”

Kingfisher were fully considered and assessed for impacts with regard to the Wind Farm Site in Section 7.6.2.3 of the EIAR. As outlined in the EIAR, effects no greater than a low effect significance (Percival, 2003) and long-term imperceptible negative effect (EPA, 2022) were predicted for kingfisher. Kingfisher were only observed on two occasions within 500m of the proposed turbine layout throughout the entire survey period (April 2020 to September 2022). This is a very low rate of occurrence. Additionally, there were no flights recorded at the potential collision height with turbines, as outlined in Section 7.6.2.3 of the EIAR, as lodged. Furthermore, there were no observations of this species, within 500m of the Wind Farm Site, between October 2022 and March 2023 (as outlined in Appendix 2), further outlining that this species is an irregular visitor to the Wind Farm Site and corroborating the information presented in the EIAR impact assessment for this species, as there has been no significant change in abundance or distribution of this species when compared to the data presented within the EIAR. In summary, as outlined in Section 7.6.2.3 of the EIAR, no significant effects are predicted.

While no significant effects are predicted for the kingfisher, pre-commencement bird surveys are proposed, as per Section 7.9.1 of the EIAR, to identify breeding and roosting locations of species of conservation concern including kingfisher. If a kingfisher nest location is identified a suitable disturbance buffer will be applied in line with best practice.

3.1.3.5 Recommendation 3(c)

“It is noted that the 'Overview Habitat Map' (Figure 4-2 in the NIS) has a boundary which does not match the application site, therefore there may be some mapping information missing. An area identified as 'bog woodland (WN7)' under Fossitt Classification corresponds with an area of 'Alkaline Fen (7230)' (as identified under Figure 4-1 and Article 17 Mapping).”

3.1.3.6 Response to Recommendation 3c

Having reviewed the submitted Figures pertinent to this observation, it is noted that Figure 4-2 of the NIS ‘Overview Habitat Map’ has the same boundary as the application site, as indicated in Figure 1-1 ‘Application Site Boundary’. However, having reviewed all figures, it has been noted that the boundary demonstrated in Figure 4-1 ‘Article 17 Mapping: Alkaline Fens’ is incorrect and differed from the application boundary. This map has been amended and is provided in Appendix 5 of this document.

Regards an overlap of an area mapped as both Bog Woodland (WN7) and Article 17 Alkaline Fen (7230), habitat mapping was undertaken by Bord na Móna Ecologists between 2011 and 2021 of the entire study area and was ground truthed by additional MKO surveys in 2020, 2021, and 2022, as well as a review of satellite imagery.

While noting that the area in question is mapped as Alkaline Fen (7230) as per Article 17 mapping, in truth, this area is dominated by Bog Woodland (WN7) and has been mapped as such by both Bord na Móna and MKO Ecologists.

3.1.3.7 Recommendation 3(d)

“An Bord Pleanála is advised to consider the Draft Cutaway Bog Rehabilitation and Decommissioning Plans 2022 (EIAR Appendix 6-6) and the impact of the proposed development on the restorative/permanent rehabilitation plans which were prepared in accordance with Condition 10.2 of IPC Licence Ref. P0501-01. The Executive Summary of the Ballivor Draft Plan notes that peatland rehabilitation for Ballivor Bog will be carried out alongside or after the proposed wind farm construction. An indicative location of 'constraints' associated with the wind farm have been identified.”

3.1.3.8 Response to Recommendation 3d

Condition 10.2 of the IPC Licence states:

“The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.”

In order to satisfy this condition, Draft Cutaway Bog Decommissioning and Rehabilitation Plans have been prepared by Bord na Móna for the bogs within Ballivor Bog Group, including Ballivor Bog, Carranstown Bog (in which advanced PCAS rehabilitation measures have already commenced), Bracklin Bog and Lisclogher east, all of which are partially or wholly within the Proposed Development Site boundary. The Draft Rehabilitation Plans are included as Appendix 6-6 of the submitted EIAR. These plans will be implemented following completion of decommissioning works at Ballivor Bog Group now that peat extraction has ceased.

The aim of the rehabilitation plans is to stabilise and rehabilitate the peatland habitats within the site and it is proposed that natural recolonisation will form the basis for the environmental stabilisation of these

areas. Under this approach, it is anticipated that considerable areas of the peatland habitats within the vicinity of the Proposed Development will re-vegetate with cutover bog habitats, including birch-dominated scrub and woodland over time as they have done in the past in areas where peat cutting has ceased for some time.

3.1.4 Recommendation 4: Borrow Pits

“An Bord Pleanála is advised to clarify the area associated with the proposed Borrow Pit 1b, where material will be extracted. This is currently stated in the application documentation.”

3.1.4.1 Response to Recommendation 4 Borrow Pits

MCC requested clarification on borrow pit 1b. It is noted that a typo was introduced into the borrow pit planning drawings and the Peat Stability Assessment Appendix 8-1 where they are numbered as ‘borrow pit 1’, ‘borrow pit 1a’ and ‘borrow pit 2’. However, throughout the remaining EIAR chapters, they are labelled ‘borrow pit 1a’, ‘borrow pit 1b’ and ‘borrow pit 2’, respectively.

The reference / numbering convention included in the EIAR is correct. The error is only included on the planning drawings (Drawing 191137-67, 191137-68 and 191137-69) and Appendix 8-1 of the EIAR. For clarity the table below outlines the name and location of each borrow pit and are illustrated in Figure 6 below.

Correct Borrow Pit EIAR Ref.	Location	Incorrect Planning Drawing Ref.	Incorrect Peat Stability Assessment
Borrow Pit 1a	Carranstown Bog to the west of the proposed access track and Bord na Móna Railway Line.	Borrow Pit 1	Borrow Pit 1
Borrow Pit 1b	Carranstown Bog approximately 80m east of Borrow Pit 1a.	Borrow Pit 1a	Borrow Pit 1a
Borrow Pit 2	Third party land immediately south of the Bracklin Bog boundary.	Borrow Pit 2	Borrow Pit 2

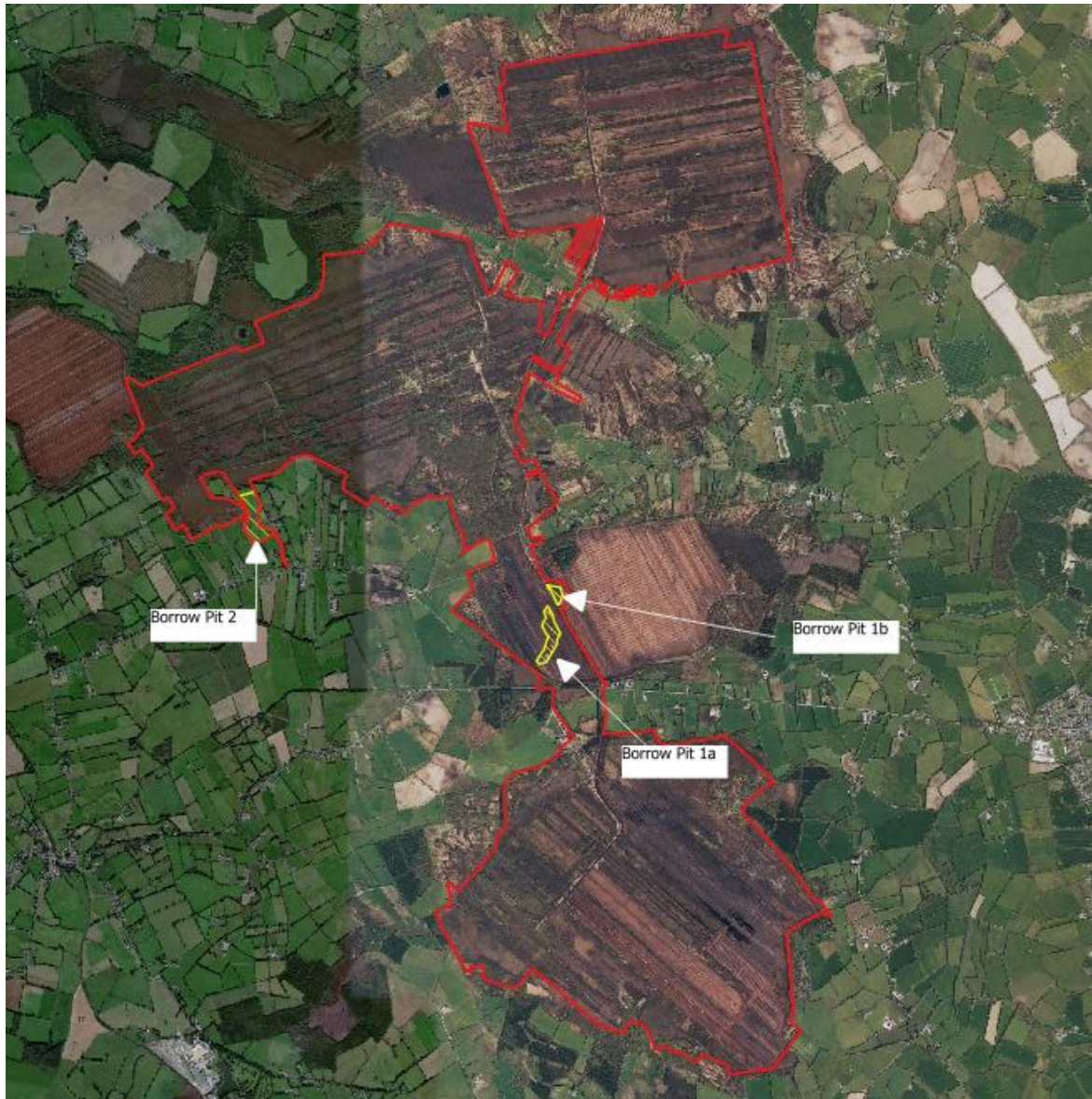


Figure 8. Borrow Pit Locations

3.1.5 Recommendation 5: Amenity Pathways and Carparks & Signage

“Bord Pleanála is requested to invite the applicant to identify those paths within the site that can be safely used for the purpose of recreation, noting the stability of proposed access routes, areas close to the proposed turbine installations, and areas adjoining bog ponds, drains, etc. A location plan layout for proposed signage could be requested (see Drawing no. 97) from the applicant.”

3.1.5.1 Response to Recommendation 5

MCC requested information regarding the extent of the public amenity paths and location of public amenity signage.

The proposed amenity pathways were included in Appendix 4.4 of the EIAR. In total, it comprises 28km of internal wind farm roads with an additional 3.3km of pathways added to create looped walks or linkage to external public roads.

The locations and content of amenity signage is not typically determined at this stage and is generally developed post consent with the input of the local community and local biodiversity and heritage groups. At a minimum information signage will be located at each car park location (3 No.) and adjacent to the Famine House in the south of Bracklin Bog. An updated Amenity Layout depicting indicative amenity signage locations has been provided in Appendix 5.

3.1.6 Recommendation 6 Electricity Substation Compound

“An Bord Pleanála are invited to clarify with the applicant, the size of on-site electricity substation compound, which is stated as 11,600 m² (as per digital documents lodged with Meath County Council though the printed document states 14,600 m²). Details pertaining to CCTV poles/other structure in the substation area have not been submitted and it is advised that these are requested.”

3.1.6.1 Response to Recommendation 6

MCC requested clarification on the scale of the proposed substation and location of CCTV cameras within the substation compound as follows:

“An Bord Pleanála are invited to clarify with the applicant, the size of onsite electricity substation compound, which is stated as 11,600m² (as per digital documents lodged with Meath County Council though the printed document states 14,600m²). Details pertaining to CCTV Poles/ other structure in the substation area have not been submitted and it is advised that these are requested.”

The applicant confirms that the footprint of the proposed onsite electricity substation compound measures approximately 11,600 m². It is likely that the temporary contractors compound, was inadvertently counted as 14,600m² on the printed document referred to above.

Regarding CCTV, it is intended to have only one camera which will be mounted on the lighting column located just inside of the IPP entrance gates to monitor access (refer to Image 1). The location of the CCTV camera is also depicted on Drawing No. 191137-63 of the planning drawing pack included with the Planning Application.



Figure 9. Location of CCTV Cameras on Lighting Column

3.1.7 Recommendation 7 Material Assets

“It is noted that there is a small airstrip located in Lisclogher West to the west of the proposed development, used recreationally by model aeroplane enthusiasts (as per Section 13.4.2.2 of the EIAR). There is no reference to this under Material Assets. ABP are directed to Section 14.2.7.2 Aviation and the conditions identified by the Irish Aviation Authority and the Department of Defence.”

3.1.7.1 Response to Recommendation 7

MCC requested clarification on the small airstrip located in Lisclogher West in Co. Westmeath, outside of the application site. This small airstrip is leased by Bord na Móna to a local Model Airplane Group to fly model aeroplanes inside a portion of Lisclogher West Bog.

The group have been liaised with as part of design of the proposed development. There is no infrastructure proposed for Lisclogher West and therefore there will be no impact to the activities of the Model Airplane Group at the site.

3.1.8 Hydrology and Hydrogeology

The following documents were also reviewed with regard to the submission by Meath County Council:

- Meath County Council Chief Executive’s Report;
- Report of Area Engineer (Internal);
- Report of Heritage Officer (Internal); and,
- Report of Senior Executive Scientist (Internal).

Further Information Requests

In the Meath County Council Chief Executive’s Report, dated 30th May 2023, a total of 7 no. suggested further information request items are identified, none of which directly relate to hydrology or hydrogeology.

However, suggested Further Information Request 1(a) refers to cumulative effects associated with the Proposed Development with the Planning Authority wishing to make the applicant and ABP aware of other renewable energy applications, specifically several solar farms (MCC Planning Ref: KA161206, KA161319, 22958 and 21396). Details regarding these developments are included in **Table B** below.

The EIAR for the Ballivor Wind Farm details the potential hydrological and hydrogeological issues relating to the construction, operation, and decommissioning phases of the proposed wind farm and propose a suite of best practice mitigation measures designed to ensure that the development does not in any way have a negative effect on downstream surface water quality and quantity. Similarly, the ERs/EIARs for the other proposed renewable energy developments referred to by Meath Co. Co. will be subject to their own assessment and water quality protection mitigation. As outlined in **Table B**, the developments are significant distances from the Ballivor Wind Farm site, and they drain to separate sub-catchments, so they have limited potential to generate cumulative impacts on receiving waters.

The remaining further information requests from Meath Co. Co. relate to noise, vibration and shadow flicker, biodiversity, borrow pits, amenity pathways, the electrical substation, and material assets. These issues are addressed separately.

Planning Ref. Number	Development Type	EIAR / Env. Report	Distance from Proposed Development Site	WFD Catchment / Sub-Catchment	Main Watercourse
KA161206	Solar Farm (17.8ha)	Env. Report	~7.4km to northeast	Boyne / Boyne_SC_070	Athboy River
KA161319	Solar Farm (16ha)	Env. Report	~6.7km to northeast	Boyne / Boyne_SC_070	Athboy River
22958	Solar Farm (21.8ha)	Env. Report	~10.3km to southeast	Boyne / Boyne_SC_030	Kinnegad River
21396	Solar Farm (121.5ha)	EIAR	~14.7km to northeast	Boyne / Blackwater[Kells]_SC_030	Blackwater River

Table 2. Summary of Renewable Energy Projects referred to by Meath Co. Co.

Environment Department (Flooding)

According to the Meath County Council Chief Executive's Report, the Flooding Department has no objections to the proposed development, subject to a number of conditions.

The items raised in suggested Condition 19 are presented and responded to below:

Condition 19 (a) All essential infrastructure shall be located outside Flood Zone A and Flood Zone B.

Response: A Flood Risk Assessment has been completed for the Proposed Development and found that the entire site is located in Flood Zone C and is at low risk of flooding.

As outlined in the Flood Risk Assessment (FRA) (EIAR Appendix 9.1) and in Section 9.3.6 of the EIAR, the flood zones mapped in Lisclogher Bog are inaccurate as they are associated with an EPA-mapped watercourse which does not exist. Site walkover surveys in this area revealed this local error in the EPA mapping and consequently in the mapping of flood zones within this area of the site. In reality, the surface of the cutover bog in the area of the mapped flood zone is drained by an extensive network of peat drains.

Condition 19 (c) The Finished Floor Level (FFL) of any essential infrastructure such as 38kV Compound Battery Storage and Inverter/Transformer to be a minimum 500mm above the 1 in 1000-year critical flood level.

Response: A detailed site-specific flood analysis has been completed for the substation location. Conservative volumetric analysis has determined the peak flood levels at the proposed substation site for 100-yr and 1000-yr rainfall events to be 74.3 and 74.6m OD respectively. The primary control in the analysis is the expanse of the bog in Carranstown West Bog which needs to fill with pluvial flood water before the substation site can flood. It was therefore recommended for project design that a substation finished floor level of >74.9mOD (74.6mOD + 0.3m freeboard) was required. Condition 19 (c) above requires a 500mm freeboard and the Applicant is happy to comply with a 500mm freeboard requirement should that be conditioned.

(d) The applicant shall ensure that there shall be no development within 10 metres of the watercourses on site to facilitate ongoing maintenance by the OPW or other parties unless otherwise agreed with the OPW and such agreement shall be submitted in writing to the Planning Authority, in advance of the commencement of development on the site.

Response: As stated in Section 2.1.5 above all of the key Proposed Development areas (turbines, hardstands, substation, construction compounds etc.) are located significantly away from the delineated 50m watercourse buffer zones except for the upgrading of the existing watercourse crossings, new drain crossings, and upgrades to the existing site access tracks. These works will not hinder any further maintenance works to be completed by the OPW.

(e) All access tracks located in Flood Zones A & B shall not be raised above the local ground level so as to not remove any flood plain storage. Tracks within Flood Zones A & B shall be delineated with a marker pole which shows the depths of the 1 in 100-year and 1 in 1,000-year events.

Response: The Proposed Development Site is mapped in Flood Zone C and is at low risk of flooding. No proposed infrastructure, including access tracks, are located in Flood Zones A or Flood Zone B.

(f) The Applicant shall carry out all works in accordance with recommendation in the Inland Fisheries Guidance Document on Protection of Fisheries during Construction Works in and Adjacent to Waters, 2016.

Response: All works will be completed in accordance with IFI guidance and recommendations.

Water Services Department

The Water Services Department broadly accepted the Proposed Development, subject to 4 no. points being addressed. These points are addressed in the following sections:

1. *The monitoring of wells within 500m of Borrow Pit No. 2 and the applicant being responsible for any remedial actions required in the events that activities impact on these existing wells.*

Response: As stated in Section 9.5.2.8 of the EIAR, there are several dwellings in close proximity to BP2. The Proposed Development will comprise the excavation of dry aggregate (above the water table) and wet aggregate (below the water table). Wet extraction can be completed without dewatering, therefore we consider that there is limited potential for water level effects on nearby wells. Groundwater quality effects, such as increased turbidity is extremely unlikely to transmit through the sand and gravel deposits, as those material themselves are very good natural filters.

Notwithstanding the foregoing, the applicant is happy to complete groundwater monitoring in all wells <500m from BP2 (provided consent is provided) to demonstrate that the development is not having any adverse effects on local private water supplies. In the unlikely event that impacts are detected, the applicant will complete appropriate remedial actions, including if required, replacing the existing water source with an equivalent supply. A pre-construction inspection and water quality testing of each well within 500m of the Borrow Pit will also be completed where allowed.

2. *The installation of permeable paving at permanent car-parking spaces.*

Response: The Proposed Development will utilise SuDS principles were applicable including the use of permeable pavements at the proposed permanent-car parking areas.

3. The requirement for Section 50 OPW consent.

Response: All road river/stream crossings (on OSI mapped watercourses) will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.

4. Comply with the Greater Dublin Code of Practice for Drainage Works.

All works completed as part of the Proposed Development will comply with the guidelines/recommendations as detailed in the Greater Dublin Code of Practice for Drainage Works. The main objectives of the Code of Practice include - compliance with best environmental practices and legislations such as the Water Framework Directive, to minimise the risk of flooding and to minimise foul sewage spills. These issues are dealt with comprehensively in the EIAR and in the appended Flood Risk Assessment.

Meath Co. Council Submissions Summary

In submissions made by Meath Co. Council to An Bord Pleanála, the proposed Ballivor Wind Farm was considered to be largely acceptable from a water quality/environmental perspective. The submission made by Meath Co. Co. sets out several further information requests and a recommended schedule of conditions. Those applicable to hydrology and water quality generally relate to pollution prevention measures, drainage management, flood risk management and the submission of a drainage management plan. These issues have been addressed in the EIAR, and the suggested planning conditions (from the Local Authority Reports) are largely consistent with the mitigation already outlined in the EIAR for the Proposed Development.

3.2

Westmeath County Council

Westmeath submitted a Report to ABP setting out the views of the Planning Authority on the proposed development, which included internal reports made by Westmeath County Council District Engineers, Environment Section, Chief Fire Officer, National Roads Office and Heritage Officer. The conclusion and recommendations by Westmeath County Council that the proposed development would, if permitted:

- *‘Make a positive contribution to Irelands national strategic policy on renewable energy and its move to a low energy carbon future*
- *Be cable of being integrated successfully at the subject site without undue adverse impact on amenity of the area*
- *Not seriously injure the residential or visual amenities of the area*
- *Have an acceptable impact on the landscape*
- *Not be likely have a significance adverse impact on any designated site or the conservation objectives pertaining to same*
- *Not be likely to adversely affect archaeological or natural heritage in the area*
- *Be acceptable in terms of traffic safety and convenience.’*

Furthermore, Westmeath County Council concluded that the siting of the proposed development on predominately cutover cutaway peatlands *‘is in compliance with Policy Objective CPO 10.146 of the Westmeath County Development Plan 2021-2027.’*

4.

CONCLUSION

This document, associated appendices and updated planning application drawings have been prepared to address the submissions/observations made and the Planning Authorities reports in respect of planning application reference ABP-316212 regarding the proposed Ballivor Wind Farm. The information constitutes a full and robust response to the matters raised and the information provided here will directly assist the Board in their ongoing consideration of the planning application.



APPENDIX 1

MARSH FRITILLARY REPORT

Marsh Fritillary Survey

Proposed Ballivor Wind
Farm





DOCUMENT DETAILS

Client: **Bord na Mona**

Project Title: **Proposed Ballivor Wind Farm**

Project Number: **191137-o**

Document Title: **Marsh Fritilary Survey**

Document File Name: **Ballivor MFR – F - 2023.08.29 – 191137-o**

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Rev	Status	Date	Author(s)	Approved By
01	Draft	29/08/2023	PD	PR
02	Draft 2	30/08/2023	PD	PR

Contents

1. INTRODUCTION	3
1.1 General Introduction.....	3
1.2 Marsh Fritillary (<i>Euphydryas aurinia</i>).....	3
1.3 Site Location	3
1.4 Statement of Authority	3
2. SURVEY METHODOLOGY	4
2.1 Desk Study.....	4
2.2 Field Survey Methodology	4
2.2.1 Surveys undertaken in 2020, 2021, and 2022.....	4
2.2.2 Surveys undertaken in 2023.....	4
3. SURVEY RESULTS	8
3.1 Surveys undertaken in 2020, 2021, and 2022.....	8
3.2 Results of the DRB Community CLG Lepidoptera Report.....	8
3.3 Surveys undertaken in 2023.....	8
3.3.1 Potential suitable marsh fritillary habitat.....	8
3.3.2 Evidence of marsh fritillary	10
4. MARSH FRITILLARY IMPACT ASSESSMENT.....	14
4.1 Assessment of the Potential Impacts on marsh fritillary during construction.....	14
4.2 Assessment of the Potential Impacts on marsh fritillary during operation.....	15
4.3 Assessment of the Potential Impacts on marsh fritillary during decommissioning	15
5. MARSH FRITILLARY MANAGEMENT PLAN.....	17
5.1 Management measures.....	17
5.2 Post-Construction Management.....	18
5.2.1 Peatland Stabilisation and Pollinator Enhancement Measures.....	18
5.2.2 Habitat enhancement monitoring programme.....	18
5.2.3 Woodland establishment.....	19
BIBLIOGRAPHY	20

TABLE OF FIGURES

<i>Figure 2-1 Survey efforts undertaken in 2020, 2021, and 2022.....</i>	<i>6</i>
<i>Figure 2-2 Survey effort undertaken in 2023 and areas surveyed for the DRB Community CLG Lepidoptera report.....</i>	<i>7</i>
<i>Figure 3-1 Results from 2023 survey efforts.....</i>	<i>13</i>

TABLE OF TABLES

<i>Table 4-1 Potential impacts on marsh fritillary.....</i>	<i>14</i>
---	-----------

TABLE OF PLATES

<i>Plate 3-1 Suitable marsh fritillary habitat identified adjacent to existing railway infrastructure between proposed Turbines 13 & 14. This is in the vicinity of Site 1 of the DRB Community CLG Lepidoptera report.</i>	<i>9</i>
--	----------



<i>Plate 3-2 Suitable marsh fritillary habitat identified in a semi-natural grassland habitat adjacent to existing railway, approximately 200m south of Plate 3-1.....</i>	<i>9</i>
<i>Plate 3-3 Suitable marsh fritillary habitat identified adjacent to existing railway infrastructure southwest of Turbine 14, in the vicinity of Site 2 of the DRB Community CLG Lepidoptera report.....</i>	<i>10</i>
<i>Plate 3-4 Marsh fritillary larval web recorded at IG N63629 57298, approximately 30m west of proposed road infrastructure and adjacent to Site 1 of the DRB Community CLG Lepidoptera report.....</i>	<i>11</i>
<i>Plate 3-5 Marsh fritillary larval web recorded at IG N63621 57275, recorded approximately 5m south of the web depicted in Plate 3-4.....</i>	<i>11</i>
<i>Plate 3-6 Marsh fritillary larval web recorded at IG N63619 57279, approximately 10m west of proposed road infrastructure and 15m north of Site 1 of the DRB Community CLG Lepidoptera report.....</i>	<i>12</i>

1. Introduction

1.1 General Introduction

In response to the submissions received pertaining to the Proposed Development (Bord Pleanála Case reference: PA25M.316212), MKO have undertaken additional marsh fritillary (*Euphydryas aurinia*) surveys within the proposed Ballivor Wind Farm site. A summary of the findings, as well as a specific management plan, have been included in this document.

1.2 Marsh Fritillary (*Euphydryas aurinia*)

Marsh fritillary is a native colonial butterfly to Ireland and is the country's only insect listed under Annex II of the EU Habitats Directive. Marsh fritillaries are widespread throughout the country and are easiest identified between early May and early July during the adults' flight period. The size of marsh fritillary populations varies greatly from year to year, mainly due to climatic factors and to cycles of attack from parasitic wasps. Adults of the species are generally sedentary, remaining in a series of linked meta-populations, forming numerous temporary sub-populations which can often die out but subsequently become recolonized from adjacent sites.

In late June females lay eggs on the underside of the leaves of Devil's bit scabious (*Succisa pratensis*), which is also the food plant of its larval stage. Populations of marsh fritillary are restricted to a particular ecological niche defined by the abundance of Devil's bit scabious and certain microhabitat conditions such as vegetation structure, aspect, sun exposure and grazing.

1.3 Site Location

The Proposed Development site lies approximately 3.5 kilometres west of Ballivor town, Co. Meath, and 23 kilometres east of Mullingar, Co. Westmeath. The IG Reference for the approximate centre of the Proposed Development is N 64676 54490.

1.4 Statement of Authority

Baseline ecological surveys were undertaken at the Proposed Development site between April 2020 and February 2023 by MKO ecologists. Those involved are listed in Section 6.3.1 of Chapter 12, Biodiversity of the submitted EIAR. A wide variety of surveys required for ecological assessment were carried out during this time period including a number of species-specific surveys such as Marsh Fritillary surveys. Further information on the Marsh Fritillary surveys and their findings was included in Chapter 6 of the EIAR and is included in Section 2 and 3 of this report, respectively.

Additional marsh fritillary surveys were undertaken on the 22nd of August 2023 by Stephanie Corkery (B.Sc., M.Sc.), Neill Campbell (B.Sc., M.Sc.), Rudraksh Gupta (B.Sc., M.Sc.), Tom Peters (B.Sc.), Mairead Kavanagh (B.Sc.), and Pádraig Desmond (B.Sc.) of MKO. All surveyors have the relevant skills and experience to undertake the required surveys.

This Marsh Fritillary Report has been prepared by Pádraig Desmond and reviewed by Pat Roberts (B.Sc., MCIEEM). Pádraig has over three years' experience in ecological surveying. Pat Roberts is Principal Ecologist at MKO with over 16 years' experience.

2. SURVEY METHODOLOGY

2.1 Desk Study

In preparation of the Biodiversity chapter, a desk study was undertaken and included a thorough review of available ecological data including the following:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS)
- Review of the publicly available National Biodiversity Data Centre (NBDC) webmapper
- *Specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Development is located.*

In the preparation of this document, the above desk study was revisited and the Lepidoptera report written by Jesmond Harding and submitted as part of the DRB Community CLG Submission to ABP was reviewed and was also considered in the 2023 survey effort.

2.2 Field Survey Methodology

Previous surveys for marsh fritillary were carried out by MKO in September 2020, 2021, and 2022. Following a review of the Lepidoptera report prepared by Jesmond Harding on behalf of and submitted by DRB Community CLG, additional surveys were undertaken on the 22nd of August 2023 to update and ground truth previous survey efforts and to assist in responding to the issues raised. The survey focused on the lands within the proposed Ballivor Wind Farm development footprint situated in counties Meath and Westmeath.

2.2.1 Surveys undertaken in 2020, 2021, and 2022

Taking account of the findings of the initial desk study and following the identification of suitable habitat for marsh fritillary within the Proposed Development Site during baseline ecological walkover surveys undertaken in 2020, targeted larval web surveys for the species were undertaken on the 3rd September 2020, 27th September 2021 and 26th September 2022. The surveys were undertaken within the optimal period for undertaking marsh fritillary larval web surveys, i.e. August – September, on dry days, with no rain and no to little wind.

The survey methodology followed that described in the best practice guidance document entitled *Guidelines for Assessment of Ecological Impacts of National Roads Schemes (NRA, 2009)*. This involved walked surveys to identify suitable areas of marsh fritillary habitat within or adjacent to the development footprint as the Proposed Development had the potential to impact on this species in areas where the development footprint overlaps with or is adjacent to suitable habitat for the species. Walked transects were also undertaken of potentially suitable habitat within and adjacent to the Proposed Development footprint to search for larval webs. Areas of suitable habitat were also mapped as part of the survey effort and informed the footprint of the Proposed Development. Survey efforts are shown in Figure 2-1.

2.2.2 Surveys undertaken in 2023

Following review of the Lepidoptera Report provided as part of a submission by DRB Community CLG, the opportunity was taken to carry out additional marsh fritillary surveys. These surveys focused on the proposed development footprint in particular the following:





- Areas identified as suitable habitat in previous surveys;
- Areas outlined in the submitted DRB Community CLG Lepidoptera Report; and
- Areas where the Proposed Development footprint overlaps with or is adjacent to suitable habitat.




These surveys, like previous years, followed the methodology described in the NRA (2009) best practice guidance document. Additionally, the NBDC methodology entitled *Habitat Condition Assessment For Marsh Fritillary* was also followed. The 2023 survey effort is shown in Figure 2-2.



Map Legend

-  WF Site Boundary
-  Survey Effort 2020
-  Survey Effort 2022
-  Footprint of Proposed Development



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Drawing Title
Previous Marsh Fritillary survey effort

Project Title
Ballivor WF - Response to Submissions





Drawn By	PD	Checked By	PR
Project No.	191137-o	Drawing No.	Figure 1-1
Scale	1:47,000	Date	25/08/2023



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Map Legend

-  WF Site Boundary
-  2023 Survey Effort
-  Footprint of Proposed Development
-  CLG Lepidoptera Report survey sites



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Drawing Title
Marsh Fritillary 2023 Survey Effort

Project Title
Ballivor WF - Response to Submissions

Drawn By	PD	Checked By	PR
Project No.	191137-o	Drawing No.	Figure 2-2
Scale	1:47,000	Date	25/08/2023

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3. SURVEY RESULTS

3.1 Surveys undertaken in 2020, 2021, and 2022

The initial desk study undertaken in 2020 identified records for marsh fritillary from the Proposed Development Site and a buffer was established around them in the design of the Proposed Development. Adult marsh fritillary were identified during the multi-disciplinary walkover survey of the Proposed Development Site in May 2020.

While small areas of suitable habitat were identified within the Proposed Development Site boundary, these areas were located along existing railway tracks and avoided in the design of the Proposed Development. No marsh fritillary larval webs were recorded within these areas during dedicated larval web surveys undertaken in September 2020, 2021, and 2022.

3.2 Results of the DRB Community CLG Lepidoptera Report

The lepidoptera report undertaken by Jesmond Harding, and submitted to ABP by DRB Community CLG, surveyed four sites, as shown in Figure 3-1, within the Proposed Development site boundary. Surveys were undertaken in May 2023 during the marsh fritillary flight period and in warm sunny conditions. None of the four sites surveyed are located within the Proposed Development footprint, but Site 1 and Site 4 are located 20m and 5m from to proposed road infrastructure, respectively. The findings of the report are summarised as follows:

Site 1

The report identified this site as a confirmed breeding site for marsh fritillary. Eighteen adult marsh fritillary were recorded during the survey effort, as well as eggs and a single pupa. This site had a varied sward height and devil's bit scabious (*Succisa pratensis*) was prevalent throughout.

Site 2

The report identified this site as suitable for marsh fritillary based on the plant composition (including devil's bit scabious) and its exposure to sunlight. One adult marsh fritillary was identified at this site.

Site 3

The report identified this site as mosaic of scrub, grassland, and bog. Two adult marsh fritillary were identified at this site.

Site 4

The report identified this site as mosaic of scrub, grassland, cutover bog, and raised bog and provides potential suitable habitat for marsh fritillary. One adult marsh fritillary were identified at this site.

Each of these sites were either on or directly adjacent to the transects undertaken during previous surveys in 2020, 2021, and 2022.

3.3 Surveys undertaken in 2023

3.3.1 Potential suitable marsh fritillary habitat

Areas identified as providing potential suitable habitat for marsh fritillary during previous survey efforts and in the DRB Community CLG Lepidoptera report were surveyed, as well as any other areas identified during the survey. On a precautionary basis, areas previously identified as providing potential suitable marsh fritillary habitat have been extended and now small sections of potential habitat, totalling 0.049 ha,

are within the Proposed Development footprint. Areas identified as potential suitable habitat are indicated in in Figure 3-1. These are areas that are exposed to high levels of sunlight and with an abundance of devil's bit scabious. Sward height in these areas was varied and no evidence of grazing was present. Plates 3-1, 3-2, and 3-3 show typical areas identified as providing potential suitable habitat for marsh fritillary.



Plate 3-1 Suitable marsh fritillary habitat identified adjacent to existing railway infrastructure between proposed Turbines 13 & 14. This is in the vicinity of Site 1 of the DRB Community CLG Lepidoptera report.



Plate 3-2 Suitable marsh fritillary habitat identified in a semi-natural grassland habitat adjacent to existing railway, approximately 200m south of Plate 3-1



Plate 3-3 Suitable marsh fritillary habitat identified adjacent to existing railway infrastructure southwest of Turbine 14, in the vicinity of Site 2 of the DRB Community CLG Lepidoptera report.

3.3.2 Evidence of marsh fritillary

Three marsh fritillary larval webs were recorded within an area identified as providing suitable habitat during the 2023 survey effort and are shown in Plates 3-4 to 3-6. This area is located between proposed Turbines 13 and 14 in the vicinity of Site 1 of the DRB Community CLG Lepidoptera report. The locations of the larval webs are shown in Figure 3-1. All larval webs recorded were outside the footprint of the Proposed Development.



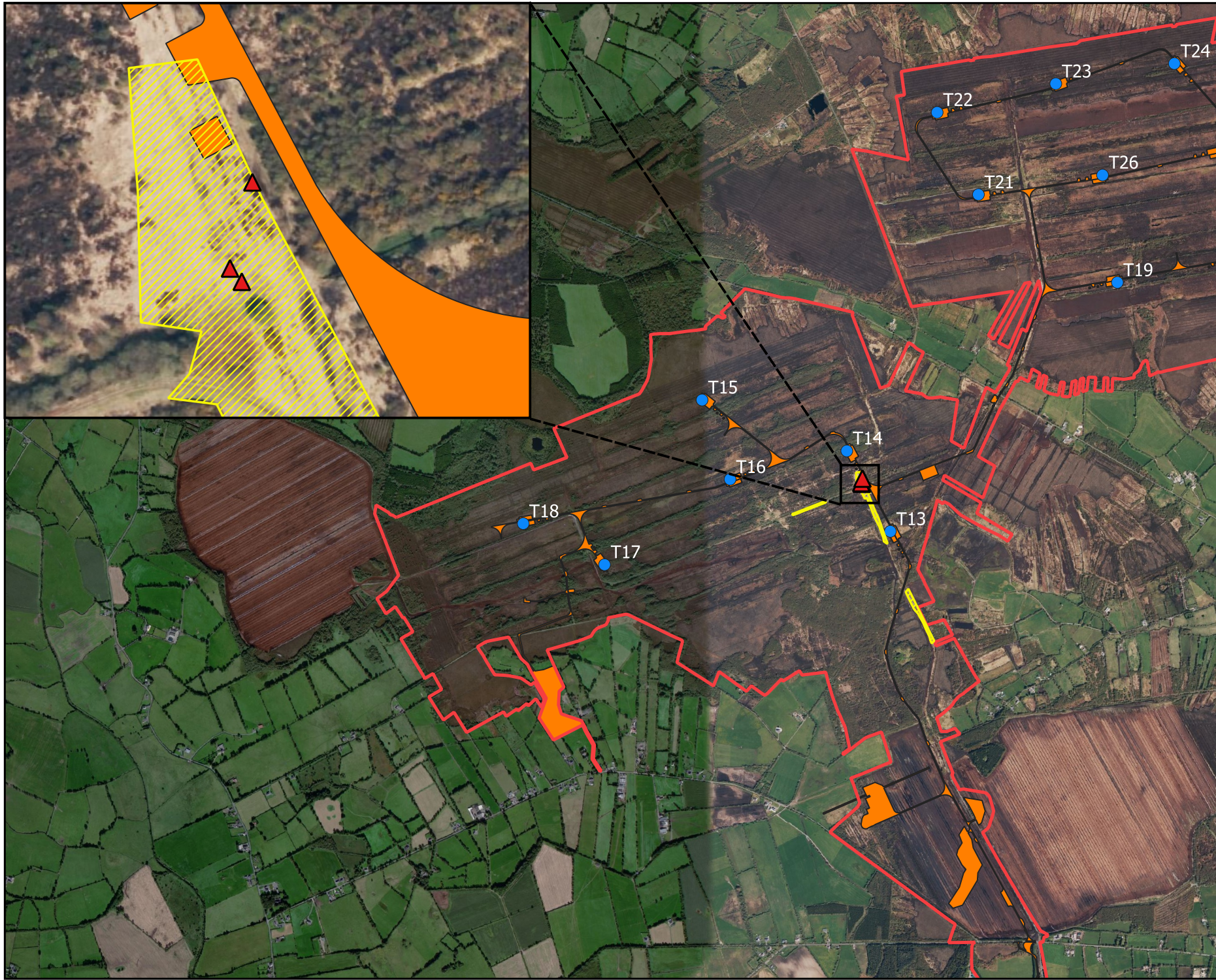
Plate 3-4 Marsh fritillary larval web recorded at IG N63629 57298, approximately 30m west of proposed road infrastructure and adjacent to Site 1 of the DRB Community CLG Lepidoptera report.



Plate 3-5 Marsh fritillary larval web recorded at IG N63621 57275, recorded approximately 5m south of the web depicted in Plate 3-4.



Plate 3-6 Marsh fritillary larval web recorded at IG N63619 57279, approximately 10m west of proposed road infrastructure and 15m north of Site 1 of the DRB Community CLG Lepidoptera report.



Map Legend

- WF Site Boundary
- Recorded Larval webs
- Identified Suitable Habitat
- Footprint of Proposed Development
- Turbine locations



Drawing Title
**2023 Marsh Fritillary
Survey Results**

Project Title
Ballivor WF - Response to Submissions

Drawn By PD	Checked By PR
Project No. 191137-o	Drawing No. Figure 3-1
Scale 1:30,000	Date 25/08/2023

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4.

MARSH FRITILLARY IMPACT ASSESSMENT

Following the recommendation from the submitted Lepidoptera report, and taking a precautionary approach, marsh fritillary have been included as a Key Ecological Receptor (KER) in this assessment. Following the formatting of Section 6.7 of the Biodiversity Chapter of the submitted EIAR, Table 4.1 below assesses the potential for significant impacts on marsh fritillary from the construction, operational, and decommissioning phases of the proposed development. Where potential impacts have been identified, mitigation has been provided.

4.1

Assessment of the Potential Impacts on marsh fritillary during construction

Table 4-1 Potential impacts on marsh fritillary.

Description of Effect	Habitat Loss The Proposed Development footprint has been specifically designed to avoid areas identified as providing suitable habitat for marsh fritillary where possible. However, following on from the 2023 survey effort, a highly precautionary approach was taken, and small sections of potentially suitable marsh fritillary habitat were identified at the very edge of the Proposed Development footprint (Figure 3-1). Therefore, there will be a direct loss of some small areas of potential habitat, totalling approximately 0.049 ha.
	Disturbance/Direct Mortality No breeding sites for marsh fritillary were identified within the footprint of the proposed development. However, larval webs were identified in close proximity to road infrastructure between Turbines 13 and 14. Therefore, there is potential for the inadvertent disturbance/direct mortality to this species arising from the construction phase of the proposed development via encroachment of machinery into identified breeding sites.
Characterisation of unmitigated effect	Habitat Loss In the absence of mitigation, the loss of approximately 0.049 ha of potential suitable habitat for marsh fritillary constitutes a permanent slight negative effect at the local scale. This would not be reversible as it is within the construction footprint.
	Disturbance/Direct Mortality In the absence of mitigation, there is potential for significant negative effects on the local marsh fritillary population via direct mortality arising from the encroachment of machinery into identified breeding sites in close proximity to the construction footprint.
Assessment of Significance prior to mitigation	Habitat Loss In the absence of mitigation, no significant overall loss of marsh fritillary habitat is anticipated at any geographic scale.
	Disturbance/Direct Mortality In the absence of mitigation, there is potential for significant impacts via direct mortality on the local marsh fritillary populations as a result of the Proposed Development.
Mitigation	Habitat Loss

	<p>The loss of approximately 0.049 ha of potential suitable habitat for marsh fritillary will be slight in nature and suitable habitat is abundant in the wider landscape and no significant impacts are anticipated.</p> <p>However, the opportunity for implementing a marsh fritillary management plan will be taken to enhance and promote further areas of suitable habitat within the development site. The implementation of this plan will negate the slight loss of potential suitable habitat for marsh fritillary within the site.</p> <p>A management plan is provided in Section 5 of this report.</p>
	<p>Disturbance/Direct Mortality</p> <p>The following mitigations will be implemented to ensure that no marsh fritillary or identified breeding sites are impacted during the construction of the proposed development:</p> <ul style="list-style-type: none"> ➤ Prior to the commencement of site works, areas of suitable marsh fritillary habitat identified within the study area will be clearly marked out by a suitably qualified ecologist and fenced off. This will avoid damage, loss or disturbance from construction machinery or the storage of materials/machinery. ➤ Other areas of potentially suitable habitat within the development footprint will be surveyed for marsh fritillary (in the appropriate season) prior to the construction phase of the proposal to identify any additional areas, to those already mapped in Figure 3-1, that may require fencing off.
	<p>Habitat Loss</p> <p>No significant loss of marsh fritillary habitat is anticipated at any geographic scale. Given the provision of the marsh fritillary management plan provided in Section 5 below, the Proposed Development will have an overall positive impact on suitable habitat for this species.</p>
Residual Effect following Mitigation	<p>Disturbance/Direct Mortality</p> <p>Following the incorporation of the mitigation measures described above, no significant negative impacts on marsh fritillary are anticipated at any geographic scale.</p>
Potential for Cumulative Effect	<p>The Proposed Development will not result in any significant negative effect on marsh fritillary, following the implementation of the best practice mitigation measures included above. It therefore cannot contribute to any cumulative effect in this regard.</p>

4.2

Assessment of the Potential Impacts on marsh fritillary during operation

The operation of the Proposed Development will not result in any additional habitat loss or deterioration for faunal species and will not result in an overall decrease in anthropogenic activity when compared to the past peat production usage of the site. No operational phase impacts on marsh fritillary or suitable habitat for this species are anticipated as a result of the Proposed Development.

4.3

Assessment of the Potential Impacts on marsh fritillary during decommissioning

It is anticipated that there will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard. In addition, the removal of the infrastructure will involve similar operations to those involved in construction but without

the large-scale earth moving or excavations as the turbine bases and roads etc. will be left in place. These works would therefore be of a smaller scale but would have potential for similar impacts on ecology to those experienced during construction. There would be no additional or ancillary impacts associated with the decommissioning phase.

Mitigations provided in Table 4-1 above for the construction phase of the Proposed Development will be implemented during decommissioning, ensuring that no marsh fritillary breeding sites are damaged/destroyed during any works.

5. MARSH FRITILLARY MANAGEMENT PLAN

5.1 Management measures

As described in Section 3.2 and Section 3.3, marsh fritillary has been confirmed breeding within the Proposed Development site, but not within the infrastructure footprint during dedicated surveys undertaken in May and August 2023. As outlined in Table 4.1 a Marsh Fritillary Management Plan will be implemented for proposed development. Measures implemented to date and those to be adopted through the various phases of development are outlined in the following sections.

Avoidance Measures

- Areas identified as having potential suitable marsh fritillary habitat were identified in the initial site walkovers in 2020 and were constrained out of the design process. As part of the iterative design process for the project, updates on results from all ongoing baseline surveys, including the subsequent Marsh Fritillary surveys in September 2020, 2021, and 2022, were also forwarded to the project design team for consideration in the design. As such, the proposed development has been designed to avoid these areas. In addition, all other elements of the proposed project will also avoid any areas of suitable marsh fritillary habitat.

Pre-construction Measures

- Prior to the commencement of site works, areas of suitable marsh fritillary habitat identified within the study area will be clearly marked out by a suitably qualified ecologist and fenced off for the duration of construction. This will avoid damage, loss or disturbance from construction machinery or the storage of materials/machinery.
- Other areas of potentially suitable habitat in close proximity to the development footprint will be surveyed for marsh fritillary prior to the commencement of site works in order to identify any additional areas to those already mapped in Figure 3-1. This will further advise on the extent of areas that may require fencing off.
- Vegetation structure and suitability will be monitored following the National Biodiversity Data Centre (NBDC) Habitat Condition Assessment methodology. This will be used to compare baseline surveys of the vegetation with future survey findings and thus assist in informing the management measures described below.

Construction Phase Measures

- Where suitable marsh fritillary habitat occurs in close proximity to the proposed infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. This will ensure that there is no potential for direct or indirect impacts on marsh fritillary habitat. This measure will also protect existing suitable habitat for other Lepidoptera/pollinator species of local importance.
- Where shallow peat occurs along the infrastructure footprint and sub peat material comprises calcareous substrate, such substrate will be used during the site reinstatement, along the infrastructure corridor. Such material will facilitate the establishment of calcareous plant species that have been recorded on spoil heaps and sub peat material within the study area. The establishment of such vegetation will benefit pollinator species generally as well as providing a food source for adult marsh fritillary. In addition, such material, in combination with the surrounding peat substrate will also create a suitable substrate for the natural colonisation of devils-bit scabious and thus marsh fritillary breeding habitat.

Tree-planting will avoid areas of suitable marsh fritillary habitat

- The proposed tree planting areas within the study area have been located away from areas of suitable marsh fritillary habitat, see the Habitat Management and Enhancement Plan in Appendix 6-5 of the submitted EIAR. This will ensure that there is no loss of potentially suitable habitat for the species.

Post-construction Monitoring and Habitat Management

- Marsh fritillary and its habitat will continue to be monitored post construction. Some minor management or scrub clearance may be required if it encroaches/establishes along the infrastructure corridor. All future habitat management measures will be supervised by a suitably qualified ecologist.
- Bord na Móna will work with and support local stakeholders to enhance the education and amenity potential of the site by erecting signage to increase awareness of local biodiversity, and in relation to supporting the monitoring of biodiversity on site.

5.2 Post-Construction Management

5.2.1 Peatland Stabilisation and Pollinator Enhancement Measures

The construction phase of the proposed project will lead to the creation of bare peat areas and verges that will require re-vegetation. This will also ensure peat stabilisation and thus surface water protection. Natural colonisation is the best method in terms of stabilising bare peat surfaces, as species colonise the are adapted to the specific environmental conditions.

However, there will be opportunities to enhance these areas for pollinating insects as part of the facilitated bare peat revegetation. Re-vegetation will be facilitated through the establishment of semi-natural grassland along the infrastructure corridor using a wildflower pollinator-friendly seed mix and/or by using ‘Green Hay’ in combination with fertiliser and/or lime and a nursery crop. The species mix will comprise of a variety of plant species that will grow on peatland habitats found in the Ballivor Bog Group and contribute to an enhancement in biodiversity. It is proposed to use a seed mix comprising of red fescue (*Festuca rubra*) and creeping bent, (*Agrostis stolonifera*) that will allow for a rapid revegetation, while not resulting in a cores/dense sward preventing other wildflower species from establishing. The use of wildflower/native species that are also locally common will be incorporated into the seed mixes. The management of the habitat in this way will be beneficial for other wildlife, particularly pollinators (bees, butterflies and other invertebrates) by providing more wildflowers, food and space.

Any management approach needs to be flexible and be tailored to the specific on-site environment where there will be a variety of peat depths, hydrological conditions and nutrient status. Management (e.g. mowing) should not be uniform. Different actions in different places should enhance the natural diversity of habitats already developing on site.

5.2.2 Habitat enhancement monitoring programme

A habitat and biodiversity monitoring programme will be put into place during both the construction and operational phase of the proposed project. Both the construction and post construction habitat management measures and monitoring will be overseen by a suitably qualified ecologist to ensure the protection of the species. A Ballivor Wind Farm habitat and biodiversity monitoring report will then be submitted by Bord na Móna to Meath and Westmeath County Councils in years 1, 3 & 5 and every five years thereafter for the lifetime of the proposed project. This report will initially document the

establishment of vegetation along the site access tracks and the distribution of the species at the site. Following this, the report will allow remedial action to be taken if specific issues develop in the future i.e. scrub encroachment or the establishment of noxious weeds. Any additional management measures will also be undertaken in consultation with a suitably qualified ecologist.

The Ballivor Wind Farm habitat and biodiversity monitoring programme will specifically monitor:

- Marsh fritillary butterfly (presence and distribution) using NBDC guidelines.
- Marsh fritillary butterfly habitat condition using NBDC guidelines.
- Record any other subsequent rare or threatened species to establish a detailed understanding of the additional biodiversity benefits of the management measures.

5.2.3 **Woodland establishment**

As part of the Proposed Development, it is proposed to fell and remove a small section of oak-ash-hazel woodland within the development footprint. It is proposed to plant new woodland habitat on suitable cutaway bog outside the infrastructure footprint but inside the development site boundary in order to replace that lost to the infrastructure footprint. Areas suitable for planting native trees are likely to include areas with shallow remnant peat, steeper slopes and indicators of future dry habitat development. The replanting lands were identified and assessed in Chapter 6, Biodiversity of the proposed EIAR and have been surveyed for marsh fritillary. No suitable habitat for the species was identified within the replanting lands.

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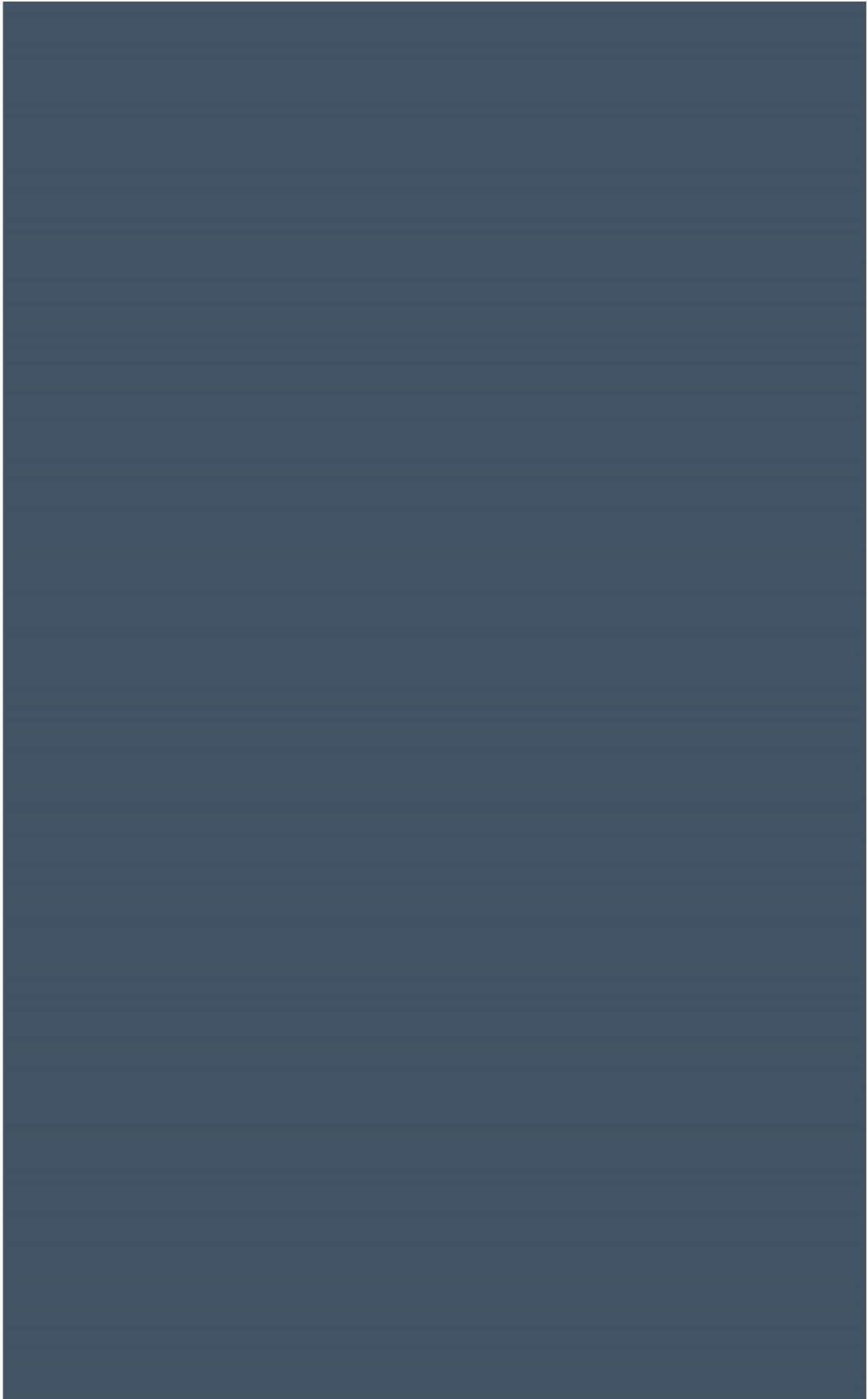
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APPENDIX 2

**WINTER BIRD SURVEY DATA
SUMMARY 2022-2023**

Winter Bird Survey Data Summary 2022-23

Ballivor Wind Farm, Co.
Meath





DOCUMENT DETAILS

Client: **Bord na Mona**

Project Title: **Ballivor Wind Farm, Co. Meath**

Project Number: **191137-I**

Document Title: **Winter Bird Survey Data Summary 2022-23**

Document File Name: **Ballivor Winter Bird Survey Data Summary_2022-23_F_2023.08.16_191137-I**

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TABLE OF TABLES

<i>Table 2-1 Vantage Point Survey Summary.....</i>	<i>3</i>
<i>Table 2-2 Winter Walkover Survey Summary.....</i>	<i>6</i>
<i>Table 2-3 Waterbird Distribution Survey Summary.....</i>	<i>7</i>
<i>Table 2-4 Hen Harrier Roost Survey Summary.....</i>	<i>9</i>
<i>Table 2-5 Incidental Records.....</i>	<i>11</i>

1. METHODS

1.1 Field Surveys

The following field surveys were undertaken from October 2022 to March 2023 inclusive:

- > Vantage Point Surveys
- > Winter Walkover surveys
- > Waterbird Distribution Surveys
- > Hen Harrier Roost Surveys
- > Golden Plover Surveys

For a description of survey methodologies for the above surveys, please refer to Section 7.2.4.2 of the EIAR for the proposed Ballivor Wind Farm Site.

2. RESULTS

2.1 Field Surveys

The following bird species were recorded during the survey period. These include species listed on **Annex I** of the EU Birds Directive (2009/147/EC), and species that are a Special Conservation Interest (**SCI**) of a Special Protection Area (SPA) designated under the EU Birds and Habitats (92/43/EEC) Directives Natura 2000 network within the zone of influence of the Wind Site, species listed on the **Red List** of Birds of Conservation Concern in Ireland (Gilbert *et al.*, 2021), and species considered sensitive to this type of development (i.e., raptor species). The list is ordered in accordance with conservation significance: Annex I species, SCIs of designated sites, Red listed species, and raptors:

- > Golden Plover (Annex I)
- > Hen Harrier (Annex 1)
- > Kingfisher (Annex I & SCI of River Boyne and River Blackwater SPA)
- > Little Egret (Annex 1)
- > Merlin (Annex 1)
- > Peregrine Falcon (Annex 1)
- > Red Kite (Annex 1)
- > Whooper Swan (Annex I)
- > Barn Owl (BoCCI Red Listed)
- > Curlew (BoCCI Red Listed)
- > Goldeneye (BoCCI Red Listed)
- > Kestrel (BoCCI Red Listed)
- > Lapwing (BoCCI Red Listed)
- > Snipe (BoCCI Red Listed)
- > Woodcock (BoCCI Red Listed)
- > Buzzard (Raptor)
- > Long-eared Owl (Raptor)
- > Sparrowhawk (Raptor)
- > BoCCI Red listed passerine species (Grey Wagtail, Meadow Pipit, Redwing, Stock Dove, Yellowhammer)

The following sections describe the species observed during surveys. Raw data and maps are provided in Appendix 1-1 and Appendix 1-2 respectively. Incidental records of birds of conservation concern are also presented.

2.1.1

Vantage Point Surveys

Summary results from vantage point surveys are presented below in Table 2-1.

Table 2-1 Vantage Point Survey Summary

Species	Total number of observations recorded during this survey type	Total Number of Bird Seconds ¹ at PCH	Number of observations on site/within 500m	Activity of note	Figure ²
Golden Plover	89	499,180	87	Golden plover were observed on 89 occasions during vantage point surveys. Observations ranged from an individual to 450 birds and comprised birds travelling, circling or flushed. There were three observations of between 1 and 100 birds roosting on the bog on-site.	Appendix 1-2, Figure 1.1
Hen Harrier	1	0	0	There was one observation of an individual male hunting in November.	Appendix 1-2, Figure 1.2
Little Egret	1	40	1	There was one observation of an individual commuting within 500m of the site.	Appendix 1-2, Figure 1.3
Merlin	15	0	15	Merlin was observed on 15 occasions on, or within 500m of, the site. Observations comprised an individual hunting, travelling or perched.	Appendix 1-2, Figure 1.4
Peregrine Falcon	25	465	24	Peregrine falcon was observed on 24 occasions on, or within 500m of, the site. Most observations comprised an individual hunting, travelling or landing on ground. Three observations on the same day in December were of a juvenile interacting with an adult bird in flight.	Appendix 1-2, Figure 1.5
Red Kite	1	0	1	There was one observation of a red kite on, or within 500m of, the site. The observations comprised an individual bird soaring/circling.	Appendix 1-2, Figure 1.6

¹ Bird Seconds are the number of birds observed multiplied by the number of seconds the flock was observed for.

² Please note that flightline numbers are a continuation of observations from the EIAR.

Species	Total number of observations recorded during this survey type	Total Number of Bird Seconds ¹ at PCH	Number of observations on site/within 500m	Activity of note	Figure ²
Whooper Swan	7	1,118	6	There were six observations of whooper swans on, or within 500m of, the site. Observations ranged from two to seven birds commuting.	Appendix 1-2, Figure 1.7
Barn Owl	1	0	1	Barn owl was observed in flight on-site on one occasion. The observation was of an individual bird travelling over the bog close to dusk.	Appendix 1-2, Figure 1.8
Kestrel	176	10,101	176	There were 176 observations of kestrel on, or within 500m of, the site. Most observations were of individuals hunting or commuting. Additionally, there were several observations of pairs interacting in flight or mobbing other raptors and corvids, indicating probable breeding at these locations.	Appendix 1-2, Figure 1.9/1.9.1
Lapwing	13	186,750	8	There were eight observations of lapwing on, or within 500m of, the site. Observations ranged from 2 to 200 birds travelling or circling.	Appendix 1-2, Figure 1.10
Snipe	78	968	77	Snipe were observed on 77 occasions on, or within 500m of, the site. All observations were of between one and twenty birds commuting, calling or drumming. Drumming indicates probable breeding at these locations.	Appendix 1-2, Figure 1.11/1.11.1
Woodcock	9	0	9	There were nine observations of woodcock on, or within 500m of, the site. Observations comprised up to three birds flushed, travelling or roding. Roding indicates probable breeding at these locations.	Appendix 1-2, Figure 1.12/1.12.1
Buzzard	184	36,492	179	Buzzard were observed on 179 occasions on, or within 500m of, the wind farm site. Observations were of up to four birds calling, soaring, hunting or perched.	Appendix 1-2, Figure 1.13
Long-eared owl	2	0	2	There were two observations of long-eared owls on, or within 500m of, the wind farm site. Both observations were of an individual bird in flight over the bog close to dusk during the same day.	Appendix 1-2, Figure 1.14
Sparrowhawk	36	435	34	Sparrowhawk were observed on 35 occasions on, or within 500m of, the wind farm site. Observations were of an individual or pair	Appendix 1-2, Figure 1.15

Species	Total number of observations recorded during this survey type	Total Number of Bird Seconds ¹ at PCH	Number of observations on site/within 500m	Activity of note	Figure ²
				soaring, hunting or mobbing. In December, a sparrowhawk was observed chasing a kestrel for a prey item.	

2.1.2

Winter Walkover Surveys

Summary results from winter walkover surveys are presented below in Table 2-2.

Table 2-2 Winter Walkover Survey Summary

Species	Total number of observations recorded during survey type	Number of observations on site/ within 500m	Activity of note	Figure ³
Golden Plover	8	8	There were eight observations of golden plover within 500m of the site. Flocks ranged from an individual to 113 birds. There were two observations of birds roosting, ranging from 14 to 65 bird.	Appendix 1-2, Figure 2.1
Hen Harrier	1	1	An individual ringtail was observed hunting over bog within 500m of the site in late March.	Appendix 1-2, Figure 2.2
Merlin	1	1	There was one observation of an individual travelling, within 500m of the site.	Appendix 1-2, Figure 2.3
Peregrine Falcon	3	3	There were three observations of peregrine falcon. All observations were of individuals travelling, perched or hunting.	Appendix 1-2, Figure 2.4
Kestrel	1	1	Kestrel were observed once, within 500m of the site. This observation was of an individual hunting.	Appendix 1-2, Figure 2.5
Lapwing	1	1	There was one observation of four lapwing in display/courtship flights within 500m of the site in late March. This indicates probable breeding of a minimum of two pairs.	Appendix 1-2, Figure 2.6/2.6.1
Snipe	16	16	Snipe were flushed by the surveyor within 500m of the site on 16 occasions. Flocks numbered between an individual and 22 birds.	Appendix 1-2, Figure 2.7
Woodcock	1	1	An individual woodcock was flushed by the surveyor within 500m of the site on one occasion.	Appendix 1-2, Figure 2.8
Buzzard	8	8	There were eight observations of buzzard. All observations were of individuals soaring, hunting or perched within 500m of the site.	Appendix 1-2, Figure 2.9

³ Please note that flightline numbers are a continuation of observations from the EIAR.

2.1.3

Waterbird Distribution Surveys

Summary results from waterbird distribution surveys are presented below in Table 2-3.

Table 2-3 Waterbird Distribution Survey Summary

Species	Total number of observations recorded during survey type	Flock Size Range	Number of observations on site/ within 500m	Activity of note	Figure ⁴
Golden Plover	3	3-150	0	There were three observations of golden plover within 5km of the site. Birds were observed circling or travelling and three birds were observed roosting in a stubble field approximately 3km from site.	Appendix 1-2, Figure 3.1
Kingfisher	2	1	0	There was one observation of an individual bird perched at the River Deel, approx. 1.8km from the site. The second observation was of a bird calling at Reynella Lake approximately 4km from the site.	Appendix 1-2, Figure 3.2
Little Egret	3	1	0	Little egret individuals were observed at three locations within 5km of the site. Birds were observed foraging, travelling or flushed.	Appendix 1-2, Figure 3.3
Whooper Swan	22	1-62	0	There were 11 observations at Annalla fields and adjacent lakes, approximately 3.5km from the site, ranging from 2 to 60 birds. Up to 62 birds were observed on feeding in fields to the south of the site along the River Deel and Riverstown river on five occasions. There were 28 birds foraging/roosting at Shay Murtagh lakes (a known roost site) on one occasion, approximately 2.3km south of the site. There were four birds observed feeding on a field north of Ballivor on one occasion. There were 11 birds observed feeding on a field east of Kilcullen on one occasion. There was one observation of 52 birds in Athboy foraging in a flooded field. Individual birds were observed once at both Joristown and Crowinstown Lake.	Appendix 1-2, Figure 3.4
Curlew	1	6	0	Curlew were observed travelling north over Shay Murtagh lakes on one occasion.	Appendix 1-2, Figure 3.5

⁴ Please note that flightline numbers are a continuation of observations from the EIAR.

Species	Total number of observations recorded during survey type	Flock Size Range	Number of observations on site/ within 500m	Activity of note	Figure ⁴
Lapwing	9	1-80	0	There were three observations of flocks at fields along the River Deel (approx. 1km from the site) with numbers ranging from 2-80 birds. There was one observation each at Reynella lakes (approx. 4km from the site), fields east of Delvin (approx. 3km from the site), Athboy (outside the 5km radius), Joristown (approx. 4.9km from the site), east of Kilcullen (approx. 3.5km from the site) and south of Crowinstown Lake (approx. 3km from the site). All observations were of birds feeding, roosting, or commuting.	Appendix 1-2, Figure 3.6
Snipe	3	1-3	0	Birds were observed at Billistown, Annalla lakes and Reynella lakes (between 3.5km and 4.4km from the site). All observations were of birds roosting or flushed by the surveyor.	Appendix 1-2, Figure 3.7

2.1.4

Hen Harrier Roost Surveys

Summary results from hen harrier roost surveys are presented below in Table 2-4.

Table 2-4 Hen Harrier Roost Survey Summary

Species	Total number of observations recorded during survey type	Number of observations on site/ within 500m	Activity of note	Roosting Status	Figure ⁵
Hen Harrier	3	3	There were three observations during hen harrier roost surveys, all during the same survey. An individual bird was observed flying/hunting over bog on-site approximately one hour before sunset.	No roost identified	Appendix 1-2, Figure 4.1

⁵ Please note that flightline numbers are a continuation of observations from the EIAR.

2.1.5

Golden Plover Survey

Golden plover surveys were carried out during the 2022-23 winter season: October to March. There were no golden plover observed during these surveys (Appendix 1-2, Figure 5).

2.1.6 Incidental Records

Incidental records of target species during the survey period are detailed in Table 2-5.

Table 2-5 Incidental Records

Species	Survey Type(s)	No. of Observations	Activity of note	Figure ⁶
Golden Plover	Vantage Point Survey Hen Harrier Roost Survey	5	There were five observations of golden plover on-site. Flocks ranged from an individual to 140 birds and observations were of birds calling, circling or travelling.	Appendix 1-2, Figure 6.1
Merlin	Hen Harrier Roost Survey	3	Merlin were observed on three occasions on-site. All observations were of an individual bird hunting or travelling.	Appendix 1-2, Figure 6.2
Peregrine Falcon	Vantage Point Survey Hen Harrier Roost Survey	2	Peregrine falcon were observed on two occasions on-site. All observations were of an individual bird travelling.	Appendix 1-2, Figure 6.3
Whooper Swan	Hen Harrier Roost Survey Vantage Point Survey Golden Plover Survey	7	There were four observations of whooper swan on, or within 500m, of the site. Observations were of between one and 11 birds travelling. There were a further three observations of up to 44 birds roosting or foraging on fields within 12km of the site.	Appendix 1-2, Figure 6.4
Barn Owl	Vantage Point Survey	1	There was one incidental observation of an individual perched on a tree close to dusk following a vantage point survey. The bird was then flushed by the surveyor.	Appendix 1-2, Figure 6.5
Goldeneye	Golden Plover Survey	1	Goldeneye were observed on one occasion within 12km of the site. A flock of 15 birds were observed landing on water and diving.	Appendix 1-2, Figure 6.6
Kestrel	Hen Harrier Roost Survey Vantage Point Survey Golden Plover Survey Waterbird Distribution Survey	17	Kestrel was observed on 14 occasions within 500m of the site. There were three observations of birds within 12km of the site. All observations were of individual birds travelling or hunting.	Appendix 1-2, Figure 6.7

⁶ Please note that flightline numbers are a continuation of observations from the EIAR.

Species	Survey Type(s)	No. of Observations	Activity of note	Figure ⁶
Lapwing	Vantage Point Survey Golden Plover Survey	2	There was one incidental observation of 100 birds circling over the site. There was another observation of 14 birds foraging in fields up to 12km from the site.	Appendix 1-2, Figure 6.8
Snipe	Hen Harrier Roost Survey Vantage Point Survey	32	There were 32 incidental observations of between one and seven birds within the site. All observations were of birds flushed, calling or commuting.	Appendix 1-2, Figure 6.9
Woodcock	Hen Harrier Roost Survey Vantage Point Survey	3	There were three incidental observations of between one and two birds within the site. All observations were of birds flushed or commuting.	Appendix 1-2, Figure 6.10
Buzzard	Hen Harrier Roost Survey Vantage Point Survey Golden Plover Survey Waterbird Distribution Survey	50	Buzzard was observed on nine occasions within 500m of the site. There were 36 observations of birds within 12km of the site. All observations were of individual birds travelling, soaring, perched or hunting.	Appendix 1-2, Figure 6.11
Sparrowhawk	Golden Plover Survey Waterbird Distribution Survey	4	An individual was observed at Reynella Lake, approx. 4km from the site. Additionally, an individual was observed at Annalla lakes, approx. 3.5km from the site. Another individual was observed at Crowinstown lake, approx. 3km from the site. There was one further observation of an individual bird within 12km of the site.	Appendix 1-2, Figure 6.12



APPENDIX 1-1

FIELD SURVEY DATA



TABLE OF CONTENTS

Appendix 1 Table 1 Survey Effort.....15

Appendix 1 Table 2 Vantage Point Survey Observations.....45

Appendix 1 Table 3 Vantage Point Survey Non Flight Observations.....93

Appendix 1 Table 4 Winter Walkover Survey Observations.....99

Appendix 1 Table 5 Waterbird Distribution and Abundance Survey Observations.....102

Appendix 1 Table 6 Hen Harrier Roost Survey Observations.....109

Appendix 1 Table 7 Incidental Observations.....110

Appendix 1 Table 8 Non-target Species Observations125

Appendix 1 Table 1 Survey Effort

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
04/10/2022	Vantage Point Survey	VP3	3:00 starting at 06:33	Visibility: moderate; Wind speed and direction: gentle breeze NE; Cloud cover and height: 33-66% >500m; Rain: light showers; Frost: none; Snow: none		KS
04/10/2022	Vantage Point Survey	VP4	3:00 starting at 10:03	Visibility: moderate; Wind speed and direction: gentle breeze NE; Cloud cover and height: 33-66% >500m; Rain: light showers; Frost: none; Snow: none		KS
06/10/2022	Vantage Point Survey	VP7	3:00 starting at 06:30	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 06:45	Visibility: moderate; Wind speed and direction: fresh breeze W; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none		MW
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 07:45	Visibility: poor; Wind speed and direction: fresh breeze W; Cloud cover and height: 66-100% <150m; Rain: persistent; Frost: none; Snow: none		MW
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 08:45	Visibility: moderate; Wind speed and direction: gentle breeze W; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		MW
06/10/2022	Vantage Point Survey	VP7	3:00 starting at 10:00	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 10:15	Visibility: poor; Wind speed and direction: moderate breeze W; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 11:15	Visibility: limited; Wind speed and direction: moderate breeze W; Cloud cover and height: 66-100% <150m; Rain: persistent; Frost: none; Snow: none		MW
06/10/2022	Vantage Point Survey	VP12	1:00 starting at 12:15	Visibility: limited; Wind speed and direction: moderate breeze W; Cloud cover and height: 66-100% <150m; Rain: persistent; Frost: none; Snow: none		MW
10/10/2022	Winter Walkover Survey	T1	2:15 starting at 11:35	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		NM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
10/10/2022	Winter Walkover Survey	T3	1:00 starting at 14:00	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		NM
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 06:30	Visibility: moderate; Wind speed and direction: light breeze E; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		MW
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 07:30	Visibility: good; Wind speed and direction: light breeze E; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		MW
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 08:30	Visibility: good; Wind speed and direction: light breeze E; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
11/10/2022	Waterbird Distribution Survey	5km Survey Radius	6:15 starting at 08:45	Visibility: moderate; Wind speed and direction: light breeze N; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 10:00	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 33-66% >500m; Rain: drizzle; Frost: none; Snow: none		MW
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 11:00	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		MW
11/10/2022	Vantage Point Survey	VP13	1:00 starting at 12:00	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		MW
11/10/2022	Winter Walkover Survey	T2	2:10 starting at 12:15	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		NM
11/10/2022	Winter Walkover Survey	T4	1:50 starting at 14:35	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		NM
12/10/2022	Vantage Point Survey	VP8	3:00 starting at 06:30	Visibility: moderate; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
12/10/2022	Vantage Point Survey	VP8	3:00 starting at 10:00	Visibility: moderate; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		SP
13/10/2022	Hen Harrier Roost Survey	HHVP1	2:05 starting at 17:10	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		NM
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 06:43	Visibility: moderate; Wind speed and direction: light air E; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
14/10/2022	Vantage Point Survey	VP10	3:00 starting at 06:51	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 07:43	Visibility: moderate; Wind speed and direction: light breeze E; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		MW
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 08:43	Visibility: moderate; Wind speed and direction: light breeze E; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		MW
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 10:13	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 33-66% 150-500m; Rain: drizzle; Frost: none; Snow: none		MW
14/10/2022	Vantage Point Survey	VP9	3:00 starting at 10:21	Visibility: moderate; Wind speed and direction: light breeze E; Cloud cover and height: 33-66% >500m; Rain: heavy showers; Frost: none; Snow: none	Heavy rain in last hour	KS
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 11:13	Visibility: moderate; Wind speed and direction: moderate breeze E; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
14/10/2022	Vantage Point Survey	VP14	1:00 starting at 13:13	Visibility: moderate; Wind speed and direction: gentle breeze E; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
14/10/2022	Hen Harrier Roost Survey	HHVP2	2:00 starting at 17:10	Visibility: good; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		NM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
25/10/2022	Vantage Point Survey	VP15	3:00 starting at 07:12	Visibility: moderate; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KS
25/10/2022	Vantage Point Survey	VP15	3:00 starting at 10:42	Visibility: moderate; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KS
25/10/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 12:00	Visibility: good; Wind speed and direction: light breeze SE; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none	No GP observed	EF
26/10/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none	No GP observed	EF
27/10/2022	Vantage Point Survey	VP11	3:00 starting at 07:15	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		EF
27/10/2022	Vantage Point Survey	VP11	3:00 starting at 10:45	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		EF
01/11/2022	Hen Harrier Roost Survey	HHVP4	2:30 starting at 15:30	Visibility: moderate; Wind speed and direction: moderate breeze NE; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		MW
02/11/2022	Vantage Point Survey	VP16	3:00 starting at 06:28	Visibility: poor; Wind speed and direction: strong breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: heavy showers; Frost: none; Snow: none		KS
02/11/2022	Vantage Point Survey	VP16	2:00 starting at 09:58	Visibility: limited; Wind speed and direction: strong breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none	Weather getting worse, will add missing hour to next survey	KS
02/11/2022	Hen Harrier Roost Survey	HHVP3	2:30 starting at 15:30	Visibility: moderate; Wind speed and direction: gale NE; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none	Heavier rain and poor visibility after 17:00	MW
03/11/2022	Vantage Point Survey	VP9	3:00 starting at 06:30	Visibility: good; Wind speed and direction: light air S; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
03/11/2022	Vantage Point Survey	VP9	3:00 starting at 10:00	Visibility: good; Wind speed and direction: light air S; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		SP
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 11:35	Visibility: good; Wind speed and direction: light air SE; Cloud cover and height: 0-33% <150m; Rain: none; Frost: none; Snow: none		MW
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 12:35	Visibility: good; Wind speed and direction: light air SE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		MW
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 13:35	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none	Dog on site at end	MW
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 15:05	Visibility: moderate; Wind speed and direction: moderate breeze SE; Cloud cover and height: 33-66% <150m; Rain: light showers; Frost: none; Snow: none		MW
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 16:05	Visibility: moderate; Wind speed and direction: gentle breeze SE; Cloud cover and height: 33-66% <150m; Rain: drizzle; Frost: none; Snow: none		MW
03/11/2022	Vantage Point Survey	VP12	1:00 starting at 17:05	Visibility: moderate; Wind speed and direction: light air SE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		MW
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 11:14	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 12:14	Visibility: good; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 13:14	Visibility: good; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 14:44	Visibility: good; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	Intermittent solid rain	MW

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 15:44	Visibility: moderate; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	Intermittent solid rain	MW
07/11/2022	Vantage Point Survey	VP14	1:00 starting at 16:44	Visibility: poor; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	Intermittent solid rain	MW
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 11:12	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 0-33% <150m; Rain: drizzle; Frost: none; Snow: none		MW
08/11/2022	Vantage Point Survey	VP1	3:00 starting at 12:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 12:12	Visibility: moderate; Wind speed and direction: fresh breeze NE; Cloud cover and height: 33-66% <150m; Rain: drizzle; Frost: none; Snow: none		MW
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 14:12	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
08/11/2022	Vantage Point Survey	VP1	3:00 starting at 15:30	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 15:42	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		MW
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 16:42	Visibility: moderate; Wind speed and direction: fresh breeze NE; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
08/11/2022	Vantage Point Survey	VP13	1:00 starting at 17:42	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		MW
09/11/2022	Vantage Point Survey	VP2	3:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
09/11/2022	Vantage Point Survey	VP2	3:00 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
14/11/2022	Hen Harrier Roost Survey	HHVP1	2:00 starting at 15:00	Visibility: good; Wind speed and direction: moderate breeze SE; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		NM
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 12:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 13:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 15:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
15/11/2022	Vantage Point Survey	VP11	1:00 starting at 16:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
16/11/2022	Waterbird Distribution Survey	5km Survey Radius	6:30 starting at 08:30	Visibility: poor; Wind speed and direction: light breeze NE; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none	Heavy fog on/off throughout survey	KS
16/11/2022	Vantage Point Survey	VP9	1:00 starting at 10:58	Visibility: limited; Wind speed and direction: light breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	Fog	MW
16/11/2022	Vantage Point Survey	VP9	1:00 starting at 11:58	Visibility: limited; Wind speed and direction: light breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	Fog	MW

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
16/11/2022	Vantage Point Survey	VP9	1:00 starting at 12:58	Visibility: poor; Wind speed and direction: light breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	Light fog	MW
17/11/2022	Vantage Point Survey	VP6	3:00 starting at 11:00	Visibility: poor; Wind speed and direction: light air NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		NM
17/11/2022	Vantage Point Survey	VP6	3:00 starting at 14:30	Visibility: good; Wind speed and direction: light breeze NW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		NM
18/11/2022	Vantage Point Survey	VP4	3:00 starting at 11:00	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		NM
18/11/2022	Vantage Point Survey	VP9	1:00 starting at 14:28	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
18/11/2022	Vantage Point Survey	VP4	3:00 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		NM
18/11/2022	Vantage Point Survey	VP9	1:00 starting at 15:28	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
18/11/2022	Vantage Point Survey	VP9	1:00 starting at 16:28	Visibility: good; Wind speed and direction: light breeze NW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 10:52	Visibility: moderate; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 11:52	Visibility: moderate; Wind speed and direction: moderate breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		MW
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 12:52	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 14:22	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
21/11/2022	Hen Harrier Roost Survey	HHVP2	2:00 starting at 14:50	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		NM
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 15:22	Visibility: good; Wind speed and direction: light breeze NW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		MW
21/11/2022	Vantage Point Survey	VP10	1:00 starting at 16:22	Visibility: good; Wind speed and direction: light air NW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		MW
22/11/2022	Vantage Point Survey	VP15	3:00 starting at 11:00	Visibility: moderate; Wind speed and direction: light air SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	Drizzle during last hour only	EF
22/11/2022	Vantage Point Survey	VP7	3:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		NM
22/11/2022	Vantage Point Survey	VP15	3:00 starting at 14:30	Visibility: moderate; Wind speed and direction: light air SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	Drizzle during last hour only	EF
22/11/2022	Vantage Point Survey	VP7	3:00 starting at 14:30	Visibility: good; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		NM
23/11/2022	Vantage Point Survey	VP10	3:00 starting at 06:50	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		SP
23/11/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% >500m; Rain: heavy showers; Frost: none; Snow: none	Showers during 2nd, 5th, 6th hour	EF
23/11/2022	Vantage Point Survey	VP16	1:00 starting at 09:20	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none	Hour outstanding from October	KS

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
23/11/2022	Vantage Point Survey	VP10	3:00 starting at 10:20	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		SP
23/11/2022	Vantage Point Survey	VP16	3:00 starting at 10:50	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KS
23/11/2022	Vantage Point Survey	VP16	3:00 starting at 14:20	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% >500m; Rain: heavy showers; Frost: none; Snow: none		KS
24/11/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:00	Visibility: good; Wind speed and direction: fresh breeze SW; Cloud cover and height: 33-66% >500m; Rain: heavy showers; Frost: none; Snow: none	Shower during 1st hour	EF
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 10:43	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		MW
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 11:43	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		MW
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 12:43	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		MW
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 14:13	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	Dogs/voices behind VP	MW
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 15:13	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	Dogs/voices behind VP	MW
30/11/2022	Vantage Point Survey	VP3	1:00 starting at 16:13	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		MW
01/12/2022	Waterbird Distribution Survey	5km Survey Radius	6:00 starting at 09:30	Visibility: moderate; Wind speed and direction: light breeze E; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KS

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
01/12/2022	Vantage Point Survey	VP5	3:00 starting at 10:45	Visibility: good; Wind speed and direction: light breeze S; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		NM
01/12/2022	Vantage Point Survey	VP5	3:00 starting at 14:15	Visibility: good; Wind speed and direction: light air S; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		NM
02/12/2022	Vantage Point Survey	VP8	3:00 starting at 10:40	Visibility: good; Wind speed and direction: light air E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		NM
02/12/2022	Vantage Point Survey	VP8	3:00 starting at 14:10	Visibility: good; Wind speed and direction: calm E; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		NM
05/12/2022	Vantage Point Survey	VP11	3:00 starting at 07:26	Visibility: good; Wind speed and direction: light breeze NE; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none		KB
05/12/2022	Vantage Point Survey	VP11	3:00 starting at 10:56	Visibility: good; Wind speed and direction: light breeze NE; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none		KB
06/12/2022	Vantage Point Survey	VP2	3:00 starting at 07:00	Visibility: good; Wind speed and direction: light air NE; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
06/12/2022	Vantage Point Survey	VP2	3:00 starting at 10:30	Visibility: good; Wind speed and direction: light air NE; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
06/12/2022	Hen Harrier Roost Survey	HHVP4	2:30 starting at 14:45	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		mw
07/12/2022	Vantage Point Survey	VP6	3:00 starting at 07:30	Visibility: poor; Wind speed and direction: light air N; Cloud cover and height: 66-100% <150m; Rain: none; Frost: heavy; Snow: none		NM
07/12/2022	Waterbird Distribution Survey	5km Survey Radius	2:00 starting at 09:15	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: light; Snow: none		DM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
07/12/2022	Vantage Point Survey	VP6	3:00 starting at 11:00	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		NM
07/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 11:15	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		DM
07/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 12:15	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		DM
07/12/2022	Waterbird Distribution Survey	5km Survey Radius	2:15 starting at 13:15	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		DM
08/12/2022	Vantage Point Survey	VP12	3:00 starting at 07:29	Visibility: good; Wind speed and direction: light air N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		KB
08/12/2022	Vantage Point Survey	VP12	3:00 starting at 10:59	Visibility: good; Wind speed and direction: light air N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
14/12/2022	Hen Harrier Roost Survey	HHVP3	2:20 starting at 14:40	Visibility: good; Wind speed and direction: light breeze N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: light; Snow: none		NM
15/12/2022	Hen Harrier Roost Survey	HHVP1	2:20 starting at 14:40	Visibility: good; Wind speed and direction: light air N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: light; Snow: none		NM
18/12/2022	Vantage Point Survey	VP13	3:00 starting at 07:39	Visibility: good; Wind speed and direction: moderate breeze SE; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: heavy; Snow: none		KB
18/12/2022	Vantage Point Survey	VP13	3:00 starting at 11:09	Visibility: good; Wind speed and direction: moderate breeze E; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: heavy; Snow: none		KB
20/12/2022	Vantage Point Survey	VP4	3:00 starting at 07:30	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
20/12/2022	Vantage Point Survey	VP4	3:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		SP
21/12/2022	Hen Harrier Roost Survey	HHVP2	2:20 starting at 14:40	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		NM
23/12/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:15	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: heavy showers; Frost: none; Snow: none	Showers for first 4 hours. No GP observed.	EF
27/12/2022	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none	No GP observed.	EF
29/12/2022	Vantage Point Survey	VP16	3:00 starting at 07:45	Visibility: good; Wind speed and direction: strong breeze SW; Cloud cover and height: 0-33% >500m; Rain: heavy showers; Frost: none; Snow: none	Shower during 3rd hour only	EF
29/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 08:30	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		DM
29/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 09:30	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none		DM
29/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 10:30	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		DM
29/12/2022	Vantage Point Survey	VP16	3:00 starting at 11:15	Visibility: good; Wind speed and direction: strong breeze SW; Cloud cover and height: 0-33% >500m; Rain: heavy showers; Frost: none; Snow: none	Shower during 3rd hour only	EF
29/12/2022	Waterbird Distribution Survey	5km Survey Radius	1:00 starting at 12:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		DM
29/12/2022	Waterbird Distribution Survey	5km Survey Radius	2:00 starting at 13:00	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		DM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
03/01/2023	Vantage Point Survey	VP14	3:00 starting at 07:42	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		KB
03/01/2023	Vantage Point Survey	VP14	3:00 starting at 11:12	Visibility: good; Wind speed and direction: moderate breeze SE; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		KB
06/01/2023	Vantage Point Survey	VP5	3:00 starting at 07:30	Visibility: good; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		SP
06/01/2023	Vantage Point Survey	VP5	3:00 starting at 11:00	Visibility: good; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		SP
09/01/2023	Vantage Point Survey	VP7	3:00 starting at 11:00	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
09/01/2023	Vantage Point Survey	VP7	3:00 starting at 14:30	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
10/01/2023	Hen Harrier Roost Survey	HHVP1	2:30 starting at 15:00	Visibility: limited; Wind speed and direction: strong breeze SSW; Cloud cover and height: 66-100% <150m; Rain: heavy showers; Frost: none; Snow: none	persistent rain to 16:00	EOB
11/01/2023	Vantage Point Survey	VP15	3:00 starting at 07:38	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: heavy showers; Frost: none; Snow: none		KB
11/01/2023	Vantage Point Survey	VP6	3:00 starting at 11:00	Visibility: moderate; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% >500m; Rain: drizzle; Frost: none; Snow: none		KS
11/01/2023	Vantage Point Survey	VP15	3:00 starting at 11:08	Visibility: good; Wind speed and direction: fresh breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		KB
11/01/2023	Vantage Point Survey	VP6	3:00 starting at 14:30	Visibility: moderate; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% >500m; Rain: drizzle; Frost: none; Snow: none		KS

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
13/01/2023	Waterbird Distribution Survey	5km Survey Radius	6:30 starting at 09:45	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		EF
16/01/2023	Vantage Point Survey	VP2	1:30 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		EOB
16/01/2023	Vantage Point Survey	VP2	1:30 starting at 12:30	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB
16/01/2023	Vantage Point Survey	VP2	1:30 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB
16/01/2023	Vantage Point Survey	VP2	1:30 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB
17/01/2023	Vantage Point Survey	VP3	1:30 starting at 11:00	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		EOB
17/01/2023	Vantage Point Survey	VP3	1:30 starting at 12:30	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		EOB
17/01/2023	Vantage Point Survey	VP3	1:30 starting at 14:30	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		EOB
17/01/2023	Vantage Point Survey	VP3	1:30 starting at 16:00	Visibility: good; Wind speed and direction: moderate breeze W; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		EOB
20/01/2023	Vantage Point Survey	VP4	3:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze ESE; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		EOB
20/01/2023	Vantage Point Survey	VP4	1:30 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
20/01/2023	Vantage Point Survey	VP4	1:30 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
23/01/2023	Vantage Point Survey	VP5	1:30 starting at 11:00	Visibility: moderate; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	dull misty	EOB
23/01/2023	Vantage Point Survey	VP5	1:30 starting at 12:30	Visibility: moderate; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	slight clearance	EOB
23/01/2023	Vantage Point Survey	VP5	1:30 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		EOB
23/01/2023	Vantage Point Survey	VP5	1:30 starting at 16:00	Visibility: good; Wind speed and direction: light breeze WSW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB
25/01/2023	Hen Harrier Roost Survey	HHVP3	3:19 starting at 14:26	Visibility: good; Wind speed and direction: light air ENE; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none	No obs, shooting going on in area	NC
25/01/2023	Hen Harrier Roost Survey	HHVP4	3:19 starting at 14:26	Visibility: good; Wind speed and direction: light air ENE; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		LM
26/01/2023	Vantage Point Survey	VP1	1:30 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
26/01/2023	Vantage Point Survey	VP16	3:00 starting at 11:30	Visibility: good; Wind speed and direction: light air NW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EF
26/01/2023	Vantage Point Survey	VP8	3:00 starting at 11:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 12:00	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
26/01/2023	Vantage Point Survey	VP1	1:30 starting at 12:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 13:00	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 14:00	Visibility: good; Wind speed and direction: light air WNW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm
26/01/2023	Vantage Point Survey	VP1	1:30 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none	cloudy	EOB
26/01/2023	Vantage Point Survey	VP16	3:00 starting at 15:00	Visibility: good; Wind speed and direction: light air NW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EF
26/01/2023	Vantage Point Survey	VP8	3:00 starting at 15:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 15:30	Visibility: moderate; Wind speed and direction: light air WNW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm
26/01/2023	Vantage Point Survey	VP1	1:30 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none	light shower	EOB
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 16:30	Visibility: moderate; Wind speed and direction: light air WNW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm
26/01/2023	Vantage Point Survey	vp12	1:00 starting at 17:30	Visibility: poor; Wind speed and direction: light air W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		flm
30/01/2023	Hen Harrier Roost Survey	HHVP2	2:30 starting at 07:17	Visibility: good; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
31/01/2023	Waterbird Distribution Survey	5km Survey Radius	6:30 starting at 10:00	Visibility: good; Wind speed and direction: fresh breeze W; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		EF
31/01/2023	Vantage Point Survey	VP9	3:00 starting at 11:00	Visibility: good; Wind speed and direction: fresh breeze NW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
31/01/2023	Vantage Point Survey	VP9	3:00 starting at 14:30	Visibility: good; Wind speed and direction: fresh breeze NW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
02/02/2023	Vantage Point Survey	VP1	3:00 starting at 07:15	Visibility: good; Wind speed and direction: fresh breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		EOB
02/02/2023	Vantage Point Survey	VP1	1:30 starting at 10:45	Visibility: moderate; Wind speed and direction: strong breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	prolonged showers	EOB
02/02/2023	Vantage Point Survey	VP1	1:30 starting at 12:15	Visibility: moderate; Wind speed and direction: strong breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	prolonged drizzle	EOB
03/02/2023	Hen Harrier Roost Survey	HHVP1	2:30 starting at 07:10	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	light drizzle	EOB
07/02/2023	Vantage Point Survey	VP2	1:30 starting at 07:00	Visibility: moderate; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none	misty	EOB
07/02/2023	Vantage Point Survey	VP2	1:30 starting at 08:30	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
07/02/2023	Vantage Point Survey	VP2	3:00 starting at 10:30	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
08/02/2023	Vantage Point Survey	VP3	3:00 starting at 07:00	Visibility: good; Wind speed and direction: moderate breeze SSW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
08/02/2023	Vantage Point Survey	VP3	3:00 starting at 10:30	Visibility: good; Wind speed and direction: strong breeze SSW; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EOB
09/02/2023	Vantage Point Survey	VP12	0:00 starting at 06:45	Visibility: ; Wind speed and direction: ; Cloud cover and height: ; Rain: ; Frost: ; Snow:		SP
09/02/2023	Vantage Point Survey	VP12	3:00 starting at 10:15	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		SP
10/02/2023	Hen Harrier Roost Survey	HHVP2	2:30 starting at 07:00	Visibility: poor; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	misty with drizzle	EOB
10/02/2023	Vantage Point Survey	VP13	3:00 starting at 07:00	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		SP
10/02/2023	Vantage Point Survey	VP13	3:00 starting at 10:30	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 33-66% <150m; Rain: none; Frost: none; Snow: none		SP
10/02/2023	Hen Harrier Roost Survey	HHVP3	1:00 starting at 14:30	Visibility: good; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
10/02/2023	Hen Harrier Roost Survey	HHVP3	1:00 starting at 15:30	Visibility: moderate; Wind speed and direction: moderate breeze WSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
10/02/2023	Hen Harrier Roost Survey	HHVP3	1:00 starting at 16:30	Visibility: moderate; Wind speed and direction: gentle breeze WSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
13/02/2023	Vantage Point Survey	VP11	3:00 starting at 07:00	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
13/02/2023	Vantage Point Survey	VP11	3:00 starting at 10:30	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
14/02/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 07:00	Visibility: poor; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
14/02/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 08:00	Visibility: moderate; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		FLM
14/02/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 09:00	Visibility: moderate; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		FLM
14/02/2023	Waterbird Distribution Survey	5km Survey Radius	6:30 starting at 09:45	Visibility: good; Wind speed and direction: gentle breeze SE; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none	Light shower during 1st hour only. Otherwise, dry	EF
15/02/2023	Vantage Point Survey	VP9	3:00 starting at 06:46	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
15/02/2023	Vantage Point Survey	VP4	1:30 starting at 06:50	Visibility: moderate; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none	gradually clearing	EOB
15/02/2023	Vantage Point Survey	VP4	1:30 starting at 08:20	Visibility: good; Wind speed and direction: gentle breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		EOB
15/02/2023	Vantage Point Survey	VP9	3:00 starting at 10:16	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		KB
15/02/2023	Vantage Point Survey	VP4	1:30 starting at 10:20	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		EOB
15/02/2023	Vantage Point Survey	VP4	1:30 starting at 11:50	Visibility: good; Wind speed and direction: strong breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none	clearer	EOB
16/02/2023	Winter Walkover Survey	T2	3:00 starting at 09:00	Visibility: moderate; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		KB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
16/02/2023	Winter Walkover Survey	T1	2:00 starting at 12:30	Visibility: good; Wind speed and direction: light breeze SW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		KB
17/02/2023	Vantage Point Survey	VP8	3:00 starting at 06:42	Visibility: good; Wind speed and direction: fresh breeze W; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KB
17/02/2023	Vantage Point Survey	VP15	3:00 starting at 07:00	Visibility: moderate; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
17/02/2023	Vantage Point Survey	VP8	3:00 starting at 10:12	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		KB
17/02/2023	Vantage Point Survey	VP15	3:00 starting at 10:30	Visibility: moderate; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		SP
18/02/2023	Vantage Point Survey	VP16	3:00 starting at 06:45	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none	Dry during 1st and 2nd hours only	EF
18/02/2023	Vantage Point Survey	VP16	3:00 starting at 10:15	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none	Dry during 1st and 2nd hours only	EF
20/02/2023	Vantage Point Survey	VP14	3:00 starting at 06:45	Visibility: moderate; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
20/02/2023	Vantage Point Survey	VP14	3:00 starting at 10:15	Visibility: moderate; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
21/02/2023	Vantage Point Survey	VP5	3:00 starting at 06:34	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
21/02/2023	Wintering Golden Plover Survey	12km Survey Radius	6:00 starting at 09:30	Visibility: good; Wind speed and direction: light breeze E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
21/02/2023	Vantage Point Survey	VP5	3:00 starting at 10:04	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
22/02/2023	Wintering Golden Plover Survey	12km Survey Radius	6:00 starting at 09:30	Visibility: good; Wind speed and direction: light breeze E; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS
23/02/2023	Vantage Point Survey	VP10	3:00 starting at 06:29	Visibility: good; Wind speed and direction: light air N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: light; Snow: none		KB
23/02/2023	Vantage Point Survey	VP10	3:00 starting at 10:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% >500m; Rain: none; Frost: none; Snow: none		KB
23/02/2023	Winter Walkover Survey	T4	2:00 starting at 14:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KB
27/02/2023	Vantage Point Survey	VP6	3:00 starting at 06:20	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
27/02/2023	Waterbird Distribution Survey	5km Survey Radius	6:30 starting at 09:30	Visibility: good; Wind speed and direction: light air E; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		EF
27/02/2023	Vantage Point Survey	VP6	3:00 starting at 09:50	Visibility: good; Wind speed and direction: light breeze W; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
27/02/2023	Winter Walkover Survey	T3	1:30 starting at 13:25	Visibility: good; Wind speed and direction: gentle breeze W; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
01/03/2023	Vantage Point Survey	VP7	3:00 starting at 06:14	Visibility: good; Wind speed and direction: light breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		KB
01/03/2023	Vantage Point Survey	VP7	3:00 starting at 09:44	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		KB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
02/03/2023	Vantage Point Survey	VP15	3:00 starting at 12:00	Visibility: good; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
02/03/2023	Vantage Point Survey	VP1	1:30 starting at 12:30	Visibility: moderate; Wind speed and direction: moderate breeze NE; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none	clearing	EOB
02/03/2023	Vantage Point Survey	VP1	1:30 starting at 14:00	Visibility: good; Wind speed and direction: moderate breeze NE; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		EOB
02/03/2023	Vantage Point Survey	VP15	3:00 starting at 15:30	Visibility: good; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
02/03/2023	Vantage Point Survey	VP1	1:30 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	gloomy	EOB
02/03/2023	Vantage Point Survey	VP1	1:30 starting at 17:30	Visibility: good; Wind speed and direction: gentle breeze NE; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none		EOB
03/03/2023	Hen Harrier Roost Survey	HHVP1	2:30 starting at 06:10	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none		EOB
03/03/2023	Vantage Point Survey	VP13	3:00 starting at 12:00	Visibility: good; Wind speed and direction: light breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
03/03/2023	Vantage Point Survey	VP13	3:00 starting at 15:30	Visibility: good; Wind speed and direction: light breeze NE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
06/03/2023	Vantage Point Survey	VP2	1:30 starting at 12:30	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none		EOB
06/03/2023	Vantage Point Survey	VP16	1:00 starting at 12:30	Visibility: moderate; Wind speed and direction: gentle breeze NNW; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		FLM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
06/03/2023	Vantage Point Survey	VP16	1:00 starting at 13:30	Visibility: moderate; Wind speed and direction: light air NNW; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		FLM
06/03/2023	Vantage Point Survey	VP2	1:30 starting at 14:00	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% <150m; Rain: heavy showers; Frost: none; Snow: none		EOB
06/03/2023	Vantage Point Survey	VP16	1:00 starting at 14:30	Visibility: moderate; Wind speed and direction: light air N; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		FLM
06/03/2023	Vantage Point Survey	VP2	1:30 starting at 16:00	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% <150m; Rain: heavy showers; Frost: none; Snow: none		EOB
06/03/2023	Vantage Point Survey	VP16	1:00 starting at 16:00	Visibility: poor; Wind speed and direction: light air N; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		FLM
06/03/2023	Vantage Point Survey	VP2	1:30 starting at 17:30	Visibility: moderate; Wind speed and direction: gentle breeze N; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none		EOB
07/03/2023	Vantage Point Survey	VP3	3:00 starting at 12:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		EOB
07/03/2023	Vantage Point Survey	VP10	1:00 starting at 13:00	Visibility: good; Wind speed and direction: light air N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		FLM
07/03/2023	Vantage Point Survey	VP10	1:00 starting at 14:00	Visibility: moderate; Wind speed and direction: light air N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		FLM
07/03/2023	Vantage Point Survey	VP10	1:00 starting at 15:00	Visibility: moderate; Wind speed and direction: light air N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		FLM
07/03/2023	Vantage Point Survey	VP3	1:30 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 33-66% 150-500m; Rain: none; Frost: none; Snow: none		EOB

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
07/03/2023	Vantage Point Survey	VP3	1:30 starting at 17:30	Visibility: good; Wind speed and direction: gentle breeze N; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		EOB
08/03/2023	Vantage Point Survey	VP6	1:30 starting at 12:30	Visibility: good; Wind speed and direction: fresh breeze ENE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: falling	brief shower	EOB
08/03/2023	Vantage Point Survey	VP6	1:30 starting at 14:00	Visibility: good; Wind speed and direction: fresh breeze ENE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: falling	brief shower	EOB
08/03/2023	Vantage Point Survey	VP6	3:00 starting at 16:00	Visibility: good; Wind speed and direction: moderate breeze ENE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		EOB
13/03/2023	Vantage Point Survey	VP4	3:00 starting at 12:45	Visibility: good; Wind speed and direction: fresh breeze NW; Cloud cover and height: 66-100% <150m; Rain: drizzle; Frost: none; Snow: none	gusts	EOB
13/03/2023	Vantage Point Survey	VP4	1:30 starting at 16:15	Visibility: good; Wind speed and direction: fresh breeze NW; Cloud cover and height: 66-100% <150m; Rain: none; Frost: none; Snow: none	clearing	EOB
13/03/2023	Vantage Point Survey	VP4	1:30 starting at 17:45	Visibility: good; Wind speed and direction: moderate breeze NW; Cloud cover and height: 0-33% 150-500m; Rain: none; Frost: none; Snow: none		EOB
14/03/2023	Vantage Point Survey	VP12	3:00 starting at 12:30	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
14/03/2023	Vantage Point Survey	VP12	3:00 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze NW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
15/03/2023	Vantage Point Survey	VP5	3:00 starting at 12:30	Visibility: moderate; Wind speed and direction: moderate breeze SE; Cloud cover and height: 66-100% <150m; Rain: heavy showers; Frost: none; Snow: none	continuous rain	EOB
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 12:30	Visibility: moderate; Wind speed and direction: moderate breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 13:30	Visibility: moderate; Wind speed and direction: moderate breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 14:30	Visibility: moderate; Wind speed and direction: moderate breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
15/03/2023	Vantage Point Survey	VP5	3:00 starting at 16:00	Visibility: moderate; Wind speed and direction: moderate breeze SE; Cloud cover and height: 66-100% <150m; Rain: heavy showers; Frost: none; Snow: none	poor visibility at times	EOB
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 16:00	Visibility: moderate; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 17:00	Visibility: moderate; Wind speed and direction: moderate breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
15/03/2023	Vantage Point Survey	VP11	1:00 starting at 18:00	Visibility: moderate; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
16/03/2023	Hen Harrier Roost Survey	HHVP2	2:30 starting at 05:40	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none		EOB
16/03/2023	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:30	Visibility: good; Wind speed and direction: gentle breeze SSW; Cloud cover and height: 66-100% >500m; Rain: light showers; Frost: none; Snow: none		EF
16/03/2023	Hen Harrier Roost Survey	HHVP3	2:30 starting at 17:30	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% <150m; Rain: light showers; Frost: none; Snow: none		NC
20/03/2023	Waterbird Distribution Survey	5km Survey Radius	7:00 starting at 08:30	Visibility: moderate; Wind speed and direction: gentle breeze SE; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		KS
20/03/2023	Vantage Point Survey	VP14	3:00 starting at 12:45	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
20/03/2023	Vantage Point Survey	VP11	3:00 starting at 13:10	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% >500m; Rain: none; Frost: none; Snow: none		KB
20/03/2023	Vantage Point Survey	VP16	3:00 starting at 13:15	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% >500m; Rain: heavy showers; Frost: none; Snow: none	Heavy showers during 5th hour. Light showers during 4th and 6th hours.	EF
20/03/2023	Vantage Point Survey	VP9	1:00 starting at 15:30	Visibility: good; Wind speed and direction: light breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
20/03/2023	Vantage Point Survey	VP14	3:00 starting at 16:15	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
20/03/2023	Vantage Point Survey	VP9	1:00 starting at 16:30	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
20/03/2023	Vantage Point Survey	VP11	3:00 starting at 16:40	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		KB
20/03/2023	Vantage Point Survey	VP16	3:00 starting at 16:45	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% >500m; Rain: heavy showers; Frost: none; Snow: none	Heavy showers during 5th hour. Light showers during 4th and 6th hours.	EF
20/03/2023	Vantage Point Survey	VP9	1:00 starting at 17:30	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
21/03/2023	Vantage Point Survey	VP7	3:00 starting at 13:12	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		KB
21/03/2023	Vantage Point Survey	VP10	1:00 starting at 15:30	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
21/03/2023	Vantage Point Survey	VP10	1:00 starting at 16:30	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
21/03/2023	Vantage Point Survey	VP7	3:00 starting at 16:42	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		KB
21/03/2023	Vantage Point Survey	VP10	1:00 starting at 17:30	Visibility: moderate; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: persistent; Frost: none; Snow: none		FLM
22/03/2023	Vantage Point Survey	VP8	3:00 starting at 13:14	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% <150m; Rain: persistent; Frost: none; Snow: none		KB
22/03/2023	Vantage Point Survey	VP8	3:00 starting at 16:44	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		KB
23/03/2023	Winter Walkover Survey	T4	2:00 starting at 08:30	Visibility: good; Wind speed and direction: moderate breeze N; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS
23/03/2023	Winter Walkover Survey	T3	2:00 starting at 10:30	Visibility: good; Wind speed and direction: moderate breeze N; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS
23/03/2023	Vantage Point Survey	VP3	3:00 starting at 13:00	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
23/03/2023	Vantage Point Survey	VP3	3:00 starting at 16:30	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		SP
24/03/2023	Vantage Point Survey	VP10	3:00 starting at 05:21	Visibility: good; Wind speed and direction: moderate breeze SW; Cloud cover and height: 33-66% >500m; Rain: light showers; Frost: none; Snow: none		KB
24/03/2023	Vantage Point Survey	VP10	3:00 starting at 08:51	Visibility: good; Wind speed and direction: fresh breeze SW; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KB
24/03/2023	Winter Walkover Survey	T1	2:00 starting at 09:00	Visibility: good; Wind speed and direction: moderate breeze N; Cloud cover and height: 33-66% >500m; Rain: none; Frost: none; Snow: none		KS

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
24/03/2023	Wintering Golden Plover Survey	12km Survey Radius	6:30 starting at 09:30	Visibility: good; Wind speed and direction: fresh breeze SW; Cloud cover and height: 66-100% 150-500m; Rain: heavy showers; Frost: none; Snow: none		EF
24/03/2023	Winter Walkover Survey	T2	2:30 starting at 11:00	Visibility: good; Wind speed and direction: moderate breeze N; Cloud cover and height: 33-66% >500m; Rain: light showers; Frost: none; Snow: none		KS
27/03/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 17:00	Visibility: good; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
27/03/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 18:00	Visibility: good; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
27/03/2023	Hen Harrier Roost Survey	HHVP4	1:00 starting at 19:00	Visibility: moderate; Wind speed and direction: gentle breeze SSE; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
28/03/2023	Winter Walkover Survey	T1	1:00 starting at 11:00	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
28/03/2023	Winter Walkover Survey	T2	1:00 starting at 12:30	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
28/03/2023	Winter Walkover Survey	T2	1:00 starting at 13:30	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
28/03/2023	Winter Walkover Survey	T3	1:00 starting at 15:45	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
28/03/2023	Winter Walkover Survey	T4	1:00 starting at 16:00	Visibility: moderate; Wind speed and direction: light breeze SSW; Cloud cover and height: 66-100% 150-500m; Rain: heavy showers; Frost: none; Snow: none		FLM
29/03/2023	Winter Walkover Survey	T4	1:30 starting at 10:00	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: drizzle; Frost: none; Snow: none		FLM

Date	Survey	Location	Duration (h)	Weather Conditions	Comments	Surveyor
29/03/2023	Winter Walkover Survey	T3	1:00 starting at 13:00	Visibility: good; Wind speed and direction: moderate breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
29/03/2023	Winter Walkover Survey	T2	1:00 starting at 15:00	Visibility: good; Wind speed and direction: moderate breeze SSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
29/03/2023	Winter Walkover Survey	T1	1:00 starting at 16:00	Visibility: good; Wind speed and direction: gentle breeze S; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
30/03/2023	Wintering Golden Plover Survey	12km Survey Radius	6:00 starting at 09:30	Visibility: good; Wind speed and direction: gentle breeze SSW; Cloud cover and height: 66-100% 150-500m; Rain: none; Frost: none; Snow: none		FLM
31/03/2023	Waterbird Distribution Survey	5km Survey Radius	6:00 starting at 08:30	Visibility: good; Wind speed and direction: moderate breeze N; Cloud cover and height: 33-66% >500m; Rain: light showers; Frost: none; Snow: none		KS
31/03/2023	Wintering Golden Plover Survey	12km Survey Radius	6:00 starting at 09:00	Visibility: good; Wind speed and direction: light breeze NNW; Cloud cover and height: 66-100% 150-500m; Rain: light showers; Frost: none; Snow: none		FLM

Appendix 1 Table 2 Vantage Point Survey Observations

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP3	04/10/2022	08:04	Meadow Pipit	4	15	15	0	0	0	cutover bog; travelling	KS
GP271	VP3	04/10/2022	08:16	Golden Plover	15	30	0	0	0	0	cutover bog; travelling	KS
-	VP3	04/10/2022	08:44	Greylag Goose	32	40	0	0	0	0	cutover bog; travelling	KS
GP272	VP4	04/10/2022	10:04	Golden Plover	2	20	0	0	0	0	cutover bog and mixed broadleaved/conifer woodland; circling	KS
SN292	VP4	04/10/2022	10:15	Snipe	1	30	0	0	0	0	cutover bog and mixed broadleaved/conifer woodland; circling	KS
K577	VP4	04/10/2022	10:29	Kestrel	1	35	35	0	35	0	cutover bog; hunting, dropped	KS
K578	VP4	04/10/2022	10:35	Kestrel	1	20	0	20	20	0	cutover bog and mixed broadleaved/conifer woodland; travelling	KS
GP273	VP4	04/10/2022	10:46	Golden Plover	30	25	0	0	0	0	cutover bog and improved agricultural grassland; circling	KS
K579	VP4	04/10/2022	11:02	Kestrel	1	20	20	0	20	0	cutover bog; landing, flew to mast	KS
GP274	VP4	04/10/2022	11:05	Golden Plover	28	600	0	0	0	0	cutover bog; circling, at PCH for ~10mins	KS
K580	VP4	04/10/2022	11:49	Kestrel	1	30	30	0	30	0	cutover bog; hunting, flew from perch	KS
GP275	VP4	04/10/2022	12:52	Golden Plover	10	60	0	60	60	0	cutover bog and mixed broadleaved/conifer woodland; circling	KS
-	VP7	06/10/2022	07:30	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flying n, calling	SP
-	VP7	06/10/2022	07:48	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying NW	SP
GP276	VP7	06/10/2022	07:58	Golden Plover	1	10	0	10	0	0	cutover bog and bog woodland; flying NE, heard only	SP
-	VP7	06/10/2022	08:21	Meadow Pipit	8	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP7	06/10/2022	08:28	Meadow Pipit	12	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP
-	VP7	06/10/2022	08:56	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying W	SP
GP277	VP7	06/10/2022	09:25	Golden Plover	2	10	0	10	0	0	cutover bog and bog woodland; flying SW	SP
GP278	VP7	06/10/2022	11:05	Golden Plover	15	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP
-	VP7	06/10/2022	11:40	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP
BZ1009	VP12	06/10/2022	07:16	Buzzard	1	60	10	50	0	0	cutover bog; circling mobbed by corvid	MW
-	VP12	06/10/2022	07:59	Meadow Pipit	2	90	70	20	0	0	cutover bog; commuting and chase flights	MW
GP279	VP12	06/10/2022	08:27	Golden Plover	47	720	100	500	120	0	cutover bog; circling some break ups of main flock	MW
-	VP12	06/10/2022	08:41	Meadow Pipit	3	90	80	0	0	0	cutover bog; flight	MW
GP280	VP12	06/10/2022	08:53	Golden Plover	45	360	80	280	0	0	cutover bog; circling	MW
GP281	VP12	06/10/2022	09:20	Golden Plover	55	420	40	100	280	0	cutover bog; circling	MW
GP282	VP12	06/10/2022	09:26	Golden Plover	35	1020	0	320	900	0	cutover bog; birds perhaps continuously in sky for past 30 mins but go out of view	MW
GP283	VP12	06/10/2022	09:40	Golden Plover	26	480	100	380	0	0	cutover bog; circling	MW
GP284	VP12	06/10/2022	10:30	Golden Plover	100	45	30	15	0	0	cutover bog; brief low flight	MW
GP285	VP12	06/10/2022	10:32	Golden Plover	100	300	200	100	0	0	cutover bog; circling	MW
GP286	VP12	06/10/2022	11:16	Golden Plover	100	120	120	0	0	0	cutover bog; low flight in loop	MW
-	VP12	06/10/2022	11:45	Meadow Pipit	4	10	10	0	0	0	cutover bog; landed in and used scrub stands by track	MW
-	VP12	06/10/2022	12:41	Meadow Pipit	1	12	12	0	0	0	cutover bog; flight from/to bog	MW
GP287	VP12	06/10/2022	12:48	Golden Plover	100	120	70	50	0	0	cutover bog; flight from and to bog	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP288	VP12	06/10/2022	12:55	Golden Plover	7	20	10	10	0	0	cutover bog; flying in from south to land with main flock	MW
GP289	VP12	06/10/2022	13:03	Golden Plover	10	80	50	30	0	0	cutover bog; first lower then higher then joining main flock on bog	MW
GP290	VP12	06/10/2022	13:16	Golden Plover	120	480	20	460	0	0	cutover bog; rose from bog (main flock), flight maybe longer but out of view	MW
GP291	VP12	06/10/2022	13:19	Golden Plover	15	120	10	110	0	0	cutover bog and scrub; flight, split off from main flock	MW
GP292	VP12	06/10/2022	13:21	Golden Plover	8	150	20	130	0	0	cutover bog; flight	MW
SN293	VP13	11/10/2022	06:45	Snipe	1	10	10	0	0	0	cutover bog; flight	MW
SN294	VP13	11/10/2022	06:53	Snipe	1	10	10	0	0	7	cutover bog; flight	MW
-	VP13	11/10/2022	07:49	Meadow Pipit	1	5	5	0	0	0	cutover bog; flight, continued behind viewshed	MW
BZ1010	VP13	11/10/2022	07:59	Buzzard	1	15	15	0	0	0	cutover bog; flight	MW
-	VP13	11/10/2022	08:12	Meadow Pipit	1	5	5	0	0	0	cutover bog; flight	MW
GP293	VP13	11/10/2022	08:30	Golden Plover	13	60	0	60	0	0	cutover bog; flight in formation	MW
K581	VP13	11/10/2022	08:35	Kestrel	1	90	80	10	0	0	scrub and conifer plantation; slowly descending flight	MW
K582	VP13	11/10/2022	09:14	Kestrel	1	45	20	25	0	0	scrub; flight	MW
GP294	VP13	11/10/2022	09:35	Golden Plover	32	15	0	15	0	0	cutover bog; soaring	MW
K583	VP13	11/10/2022	10:22	Kestrel	1	560	150	410	0	0	scrub; hunting	MW
K584	VP13	11/10/2022	10:31	Kestrel	1	120	20	100	0	0	conifer plantation; commuting and brief survey hovers, over conifers	MW
K585	VP13	11/10/2022	10:44	Kestrel	2	50	20	30	0	0	conifer plantation and scrub; flight, one bird soaring or hunting at end, seemingly two birds flying together, one flew further east	MW
K586	VP13	11/10/2022	10:48	Kestrel	1	20	20	0	0	0	scrub and conifer plantation; flight, with last chronological record - one of two birds	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K587	VP13	11/10/2022	11:04	Kestrel	1	120	100	20	0	0	scrub; hunting then descent/dive, over scrub	MW
K588	VP13	11/10/2022	11:11	Kestrel	1	100	80	20	0	0	scrub; hunting, over scrub	MW
K589	VP13	11/10/2022	11:24	Kestrel	1	5	0	5	0	0	cutover bog; soaring	MW
K590	VP13	11/10/2022	11:40	Kestrel	1	90	10	80	0	0	cutover bog; hunting then flight	MW
K591	VP13	11/10/2022	12:17	Kestrel	1	210	70	140	0	0	scrub; hunting ending in plunge	MW
K592	VP13	11/10/2022	12:32	Kestrel	1	300	120	180	0	0	scrub; hunting, possibly 2 birds scrub	MW
SN295	VP8	12/10/2022	07:20	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP
-	VP8	12/10/2022	07:40	Meadow Pipit	2	5	5	0	0	0	cutover bog and bog woodland; flying s	SP
SH195	VP8	12/10/2022	07:55	Sparrowhawk	1	5	5	0	0	0	cutover bog and bog woodland; flying low se, male	SP
-	VP8	12/10/2022	08:14	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flying SW	SP
-	VP8	12/10/2022	08:36	Mute Swan	2	10	10	0	0	0	cutover bog and bog woodland; flying ne, low over trees	SP
-	VP8	12/10/2022	09:00	Meadow Pipit	3	5	5	0	0	0	cutover bog and bog woodland; flying ne	SP
-	VP8	12/10/2022	09:15	Meadow Pipit	5	10	10	0	0	0	cutover bog and bog woodland; flying n	SP
BZ1011	VP8	12/10/2022	09:17	Buzzard	1	3	3	0	0	0	cutover bog and bog woodland; flying w, very low in trees	SP
SN296	VP8	12/10/2022	10:36	Snipe	20	10	10	0	0	0	cutover bog and bog woodland; flying w, calling	SP
-	VP8	12/10/2022	10:53	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flying n, very low	SP
SN297	VP8	12/10/2022	12:20	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; flew SW	SP
BZ1012	VP10	14/10/2022	07:18	Buzzard	1	0	0	0	0	0	mixed broadleaved/conifer woodland; calling	KS
-	VP14	14/10/2022	08:14	Meadow Pipit	4	10	10	0	0	0	cutover bog; flight	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP295	VP10	14/10/2022	08:33	Golden Plover	34	60	0	0	0	0	improved agricultural grassland; circling	KS
GP296	VP10	14/10/2022	08:41	Golden Plover	18	45	0	0	0	0	improved agricultural grassland; circling	KS
BZ1013	VP10	14/10/2022	08:43	Buzzard	1	0	0	0	0	0	mixed broadleaved/conifer woodland; calling	KS
K593	VP14	14/10/2022	08:50	Kestrel	1	5	5	0	0	0	cutover bog; flight	MW
-	VP14	14/10/2022	09:00	Mute Swan	4	60	0	40	20	0	cutover bog; migration flight, either mute or whooper swan but too distant to id even with scope	MW
-	VP14	14/10/2022	09:09	Meadow Pipit	5	4	4	0	0	0	scrub and cutover bog; perched in young scrub tree, scrub or bog?	MW
WS116	VP10	14/10/2022	09:24	Whooper Swan	7	60	0	0	0	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; travelling	KS
GP297	VP10	14/10/2022	11:08	Golden Plover	18	90	0	0	0	0	improved agricultural grassland; circling	KS
BZ1014	VP14	14/10/2022	11:15	Buzzard	1	120	10	70	40	0	cutover bog and scrub; flight, soaring, mobbed by corvid	MW
BZ1015	VP9	14/10/2022	11:25	Buzzard	1	45	0	45	45	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KS
-	VP14	14/10/2022	11:34	Meadow Pipit	1	80	40	40	0	0	cutover bog; flight	MW
BZ1016	VP10	14/10/2022	11:53	Buzzard	1	240	0	0	0	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KS
BZ1017	VP10	14/10/2022	12:58	Buzzard	1	90	0	0	0	0	cutover bog; soaring	KS
BZ1018	VP14	14/10/2022	13:06	Buzzard	1	180	0	120	60	0	cutover bog; territorial display flight	MW
BZ1019	VP14	14/10/2022	13:10	Buzzard	2	120	0	110	10	0	cutover bog; territorial dispute or pair behaviour	MW
-	VP15	25/10/2022	07:31	Mallard	2	5	5	0	0	0	cutover bog; calling	KS

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP298	VP15	25/10/2022	08:51	Golden Plover	95	60	0	0	0	60	cutover bog; circling	KS
SH196	VP15	25/10/2022	09:00	Sparrowhawk	1	20	0	20	0	0	cutover bog and mixed broadleaved/conifer woodland; travelling	KS
GP299	VP15	25/10/2022	09:15	Golden Plover	65	260	0	0	260	0	cutover bog; travelling, flocks moving in groups SW	KS
K594	VP15	25/10/2022	09:40	Kestrel	1	60	0	60	0	0	cutover bog and mixed broadleaved/conifer woodland; hunting, mobbed, attempting to hunt but mobbed by crows	KS
-	VP15	25/10/2022	09:53	Meadow Pipit	2	15	15	0	0	0	cutover bog; travelling	KS
PE095	VP15	25/10/2022	11:22	Peregrine Falcon	1	120	0	0	120	0	cutover bog and mixed broadleaved/conifer woodland; travelling, mobbed, mobbed by crows	KS
SN298	VP15	25/10/2022	11:39	Snipe	1	30	0	0	30	0	cutover bog and mixed broadleaved/conifer woodland; travelling	KS
K595	VP15	25/10/2022	12:32	Kestrel	1	45	0	45	0	0	cutover bog and mixed broadleaved/conifer woodland; hunting, behind VP	KS
K596	VP15	25/10/2022	12:48	Kestrel	1	30	0	30	0	0	cutover bog and mixed broadleaved/conifer woodland; hunting	KS
K597	VP15	25/10/2022	12:57	Kestrel	1	30	0	30	0	0	cutover bog; hunting	KS
K598	VP15	25/10/2022	13:12	Kestrel	1	15	15	0	0	0	cutover bog; hunting, dropped	KS
K599	VP15	25/10/2022	13:26	Kestrel	1	30	30	0	0	0	cutover bog; hunting	KS
-	VP11	27/10/2022	07:40	Meadow Pipit	1	6	6	0	0	0	heath and scrub; flying/calling. landed	EF
K600	VP11	27/10/2022	08:20	Kestrel	1	7	7	0	0	0	heath and scrub; flying, flew behind	EF
K601	VP11	27/10/2022	08:20	Kestrel	1	10	10	0	0	0	heath and scrub; flying/landed, landed in birch. different bird than id2	EF
-	VP11	27/10/2022	08:45	Redwing	14	12	0	12	0	0	heath and scrub; flying/calling	EF
-	VP11	27/10/2022	08:50	Meadow Pipit	6	8	8	0	0	0	heath and scrub; flying/calling. landed	EF

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP300	VP11	27/10/2022	08:50	Golden Plover	80	120	0	0	120	0	heath and scrub; flying/circling	EF
GP301	VP11	27/10/2022	09:10	Golden Plover	80	600	0	0	600	0	heath and scrub; circling/flying, good scope views	EF
K602	VP11	27/10/2022	11:55	Kestrel	1	68	8	60	0	0	heath and scrub; hovering/flying/hunting, lost in birch scrub	EF
K603	VP11	27/10/2022	12:05	Kestrel	1	59	0	59	0	0	heath and scrub; hovering/hunting/flying, lost in birch scrub	EF
SN299	VP11	27/10/2022	12:05	Snipe	1	5	5	0	0	0	heath and scrub; flew up from heather, while watching k	EF
K604	VP11	27/10/2022	12:50	Kestrel	1	11	0	11	0	0	heath and scrub; flying/dropped suddenly, lost behind trees	EF
K605	VP11	27/10/2022	13:40	Kestrel	1	143	0	0	143	0	heath and scrub; flying/hovering, lost behind trees	EF
SN300	VP16	02/11/2022	06:39	Snipe	1	5	5	0	0	0	cutover bog; flushed	KS
SH197	VP16	02/11/2022	07:57	Sparrowhawk	1	30	0	30	0	0	cutover bog; travelling	KS
-	VP16	02/11/2022	07:57	Redwing	20	60	0	0	60	0	mixed broadleaved/conifer woodland and cutover bog; circling over trees	KS
-	VP16	02/11/2022	09:04	Lesser Black-backed Gull	1	20	0	0	20	0	mixed broadleaved/conifer woodland, improved agricultural grassland and cutover bog; travelling	KS
SH198	VP9	03/11/2022	08:01	Sparrowhawk	1	5	5	0	0	0	cutover bog and bog woodland; flew NW, female seen very briefly	SP
SH199	VP9	03/11/2022	08:46	Sparrowhawk	2	10	10	0	0	0	cutover bog and bog woodland; flying over trees, male and female moved NW	SP
-	VP9	03/11/2022	10:01	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flying e	SP
SH200	VP9	03/11/2022	11:07	Sparrowhawk	1	15	15	0	0	0	cutover bog and bog woodland; circling male, moved NW	SP
-	VP9	03/11/2022	11:35	Meadow Pipit	6	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP9	03/11/2022	11:50	Meadow Pipit	8	10	10	0	0	0	cutover bog and bog woodland; flying s	SP
BZ1020	VP9	03/11/2022	12:17	Buzzard	1	5	5	0	0	0	cutover bog and bog woodland; low over trees, NW of VP9	SP
-	VP9	03/11/2022	12:37	Meadow Pipit	5	10	10	0	0	0	cutover bog and bog woodland; flying ne	SP
BZ1021	VP12	03/11/2022	12:31	Buzzard	1	120	0	0	30	90	cutover bog; circling then direct flight	MW
GP302	VP12	03/11/2022	13:05	Golden Plover	22	200	180	20	0	0	cutover bog; flight	MW
K606	VP12	03/11/2022	13:24	Kestrel	1	40	40	0	0	0	cutover bog; landed and perched on bog, lost sight of after	MW
BZ1022	VP12	03/11/2022	13:45	Buzzard	1	100	0	20	80	0	cutover bog; flight only	MW
K607	VP12	03/11/2022	14:09	Kestrel	1	30	30	0	0	0	conifer plantation; flight over conifers	MW
BZ1023	VP12	03/11/2022	14:21	Buzzard	2	140	40	100	0	0	cutover bog and scrub; two birds at start, related or pair. one bird split and flew off due north of vp12 after 15 seconds. bird two appeared to use scrub	MW
BZ1024	VP12	03/11/2022	14:37	Buzzard	1	30	30	0	0	0	cutover bog; flight	MW
BZ1025	VP12	03/11/2022	15:22	Buzzard	1	60	60	0	0	0	conifer plantation and cutover bog; hunting just above tree canopy unperturbed by hooded crows, using pylons as rest point	MW
BZ1026	VP12	03/11/2022	15:25	Buzzard	1	180	20	130	30	0	cutover bog; soaring then flying away	MW
BZ1027	VP12	03/11/2022	15:44	Buzzard	1	150	0	30	120	0	conifer plantation and cutover bog; soaring and commuting	MW
K608	VP14	07/11/2022	11:26	Kestrel	1	240	210	30	0	0	cutover bog; surveying/hunting the n hunting towards end	MW
K609	VP14	07/11/2022	11:51	Kestrel	1	80	70	10	0	0	cutover bog; hunting	MW
K610	VP14	07/11/2022	11:58	Kestrel	1	60	60	0	0	0	cutover bog; hunting	MW
K611	VP14	07/11/2022	12:07	Kestrel	1	40	40	0	0	0	scrub; hunting with dive	MW
K612	VP14	07/11/2022	12:16	Kestrel	2	30	30	0	0	0	scrub; hunting, second bird swooped into area at end	Name

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K613	VP14	07/11/2022	12:18	Kestrel	1	140	0	0	0	0	scrub; hunting, repeated diving, at edge between scrub and railway track	MW
K614	VP14	07/11/2022	13:55	Kestrel	1	5	0	0	0	0	cutover bog; caught flying out of viewshed	MW
K615	VP14	07/11/2022	16:12	Kestrel	1	40	40	0	0	0	cutover bog; commuting	MW
K616	VP14	07/11/2022	17:03	Kestrel	1	10	0	0	0	0	cutover bog; flight, visibility poor so cannot rule out male sparrowhawk	MW
-	VP1	08/11/2022	12:05	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flying w	SP
-	VP1	08/11/2022	12:34	Meadow Pipit	2	5	5	0	0	0	cutover bog and bog woodland; flying n	SP
BZ1028	VP1	08/11/2022	12:35	Buzzard	1	5	5	0	0	0	cutover bog and bog woodland; flying SW, over trees SW of VP	SP
-	VP1	08/11/2022	13:15	Meadow Pipit	12	10	10	0	0	0	cutover bog and bog woodland; flying NW	SP
BZ1030	VP1	08/11/2022	13:37	Buzzard	2	240	240	0	0	0	cutover bog and bog woodland; circling/soaring, 1 moved SW other NW	SP
-	VP1	08/11/2022	14:20	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flying SW, low over trees SW of VP	SP
SH201	VP1	08/11/2022	14:28	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; circling male, N of VP moved ne	SP
SN301	VP1	08/11/2022	14:32	Snipe	4	10	10	0	0	0	cutover bog and bog woodland; flying se	SP
HH016	VP1	08/11/2022	14:33	Hen Harrier	1	20	20	0	0	0	cutover bog and bog woodland; flying e male, quartering the bog	SP
SH202	VP1	08/11/2022	16:47	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; male flying w, low hunting over bog	SP
SN302	VP1	08/11/2022	17:20	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; flying e, calling	SP
SN303	VP1	08/11/2022	17:33	Snipe	7	10	10	0	0	0	cutover bog and bog woodland; flying e, calling dusk flights	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K617	VP13	08/11/2022	11:22	Kestrel	1	140	100	40	0	0	scrub and conifer plantation; surveying then hunting with dive to ground at end., male	MW
K618	VP13	08/11/2022	11:54	Kestrel	1	30	30	0	0	0	cutover bog; fight and then perched on tree on vp edge; then behind viewshed, incidental record continued, female	MW
K619	VP13	08/11/2022	12:03	Kestrel	1	60	60	0	0	0	cutover bog; chasing corvids then low flight to perch on bog	MW
K620	VP13	08/11/2022	12:19	Kestrel	1	100	0	0	0	0	scrub; surveying	MW
BZ1029	VP13	08/11/2022	12:43	Buzzard	1	300	45	255	0	0	cutover bog and scrub; hovering and gliding very slowly over bog, also used scrub	MW
K621	VP13	08/11/2022	13:19	Kestrel	1	60	60	0	0	0	scrub; hunting	MW
K622	VP13	08/11/2022	13:46	Kestrel	1	45	45	0	0	0	cutover bog; hunting	MW
K623	VP13	08/11/2022	13:49	Kestrel	1	45	0	0	0	0	scrub; hunting	MW
K624	VP13	08/11/2022	13:51	Kestrel	1	420	40	250	120	0	scrub; hunting and travelling, male	MW
K625	VP13	08/11/2022	14:11	Kestrel	1	150	30	120	0	0	scrub; hovering, female	MW
K626	VP13	08/11/2022	15:02	Kestrel	1	60	0	60	0	0	scrub and improved agricultural grassland; flight	MW
K627	VP13	08/11/2022	15:27	Kestrel	1	360	60	300	0	0	cutover bog; hunting	MW
-	VP2	09/11/2022	11:02	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying n	SP
-	VP2	09/11/2022	11:25	Redwing	5	5	5	0	0	0	cutover bog and bog woodland; flying s	SP
BZ1031	VP2	09/11/2022	11:35	Buzzard	2	180	180	0	0	0	cutover bog and bog woodland; soaring/circling, over trees w of VP	SP
K628	VP2	09/11/2022	11:35	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; hunting female, moving NW over bog	SP
SH203	VP2	09/11/2022	12:01	Sparrowhawk	1	120	120	0	0	0	cutover bog and bog woodland; female flying s, along tree line W of VP	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K629	VP2	09/11/2022	12:10	Kestrel	1	900	900	0	0	0	cutover bog and bog woodland; hunting female, moved s over whole area	SP
SH204	VP2	09/11/2022	12:18	Sparrowhawk	60	60	0	60	0	0	cutover bog and bog woodland; circling female, NW of VP flew SW	SP
-	VP2	09/11/2022	12:30	Redwing	65	30	30	0	0	0	cutover bog and bog woodland; flying se, S of VP	SP
-	VP2	09/11/2022	13:32	Redwing	85	20	20	0	0	0	cutover bog and bog woodland; flying ne, N of VP	SP
BZ1032	VP2	09/11/2022	13:48	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; low over trees, west of VP	SP
K630	VP2	09/11/2022	14:35	Kestrel	1	240	240	0	0	0	cutover bog and bog woodland; flying s hunting, S of VP	SP
K631	VP2	09/11/2022	15:01	Kestrel	1	240	240	0	0	0	cutover bog and bog woodland; hunting female, W of VP flew off se	SP
-	VP2	09/11/2022	15:36	Redwing	150	60	60	0	0	0	cutover bog and bog woodland; flew SW, NW of VP	SP
BZ1033	VP2	09/11/2022	16:49	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; flying n, NW of VP very low	SP
SN304	VP2	09/11/2022	17:18	Snipe	1	10	10	0	0	0	cutover bog and bog woodland; flying n, heard calling	SP
K632	VP11	15/11/2022	11:34	Kestrel	1	60	60	0	0	0	cutover bog; hunting, female. used conifer as perch	MW
SN305	VP11	15/11/2022	11:36	Snipe	6	30	30	0	0	0	cutover bog; flushed	MW
WS117	VP11	15/11/2022	12:04	Whooper Swan	3	60	0	60	0	0	cutover bog; flight, whooper swans	MW
-	VP11	15/11/2022	12:06	Meadow Pipit	1	50	50	0	0	0	cutover bog; flight	MW
K633	VP11	15/11/2022	12:29	Kestrel	1	20	0	20	0	0	conifer plantation; hunting, over conifers	MW
SH205	VP11	15/11/2022	13:09	Sparrowhawk	1	25	20	5	0	0	scrub and cutover bog; flight at treetop height, female	MW
K634	VP11	15/11/2022	13:25	Kestrel	1	360	30	180	150	0	cutover bog and scrub; commuting and hunting, female	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K635	VP11	15/11/2022	13:28	Kestrel	1	120	0	120	0	0	scrub and cutover bog; hunting, using bog and scrub at same time	MW
K636	VP11	15/11/2022	14:47	Kestrel	1	120	120	0	0	0	cutover bog and scrub; chased by rook then hunting and then perched	MW
K637	VP11	15/11/2022	14:50	Kestrel	1	270	20	100	150	0	scrub and cutover bog; hunting	MW
WK058	VP11	15/11/2022	17:25	Woodcock	2	15	15	0	0	0	cutover bog; flight	MW
K638	VP6	17/11/2022	11:49	Kestrel	1	16	0	16	0	0	improved agricultural grassland and conifer plantation; travelling south	NM
K639	VP6	17/11/2022	12:49	Kestrel	1	182	12	170	0	0	cutover bog; travelling/hunting	NM
GP303	VP4	18/11/2022	12:23	Golden Plover	29	810	12	8	790	0	cutover bog; display flight	NM
K640	VP4	18/11/2022	13:05	Kestrel	1	193	0	102	91	0	cutover bog; hunting	NM
K641	VP4	18/11/2022	13:10	Kestrel	1	248	0	248	0	0	cutover bog; hunting	NM
K642	VP4	18/11/2022	13:14	Kestrel	1	62	32	30	0	0	cutover bog; travelling	NM
-	VP4	18/11/2022	13:18	Redwing	1	8	8	0	0	0	cutover bog; travelling	NM
GP304	VP4	18/11/2022	13:28	Golden Plover	63	48	22	8	18	0	cutover bog; travelling west, flock rising from regular roost location	NM
GP305	VP4	18/11/2022	13:53	Golden Plover	17	201	0	0	201	0	cutover bog and conifer plantation; display flight	NM
BZ1034	VP4	18/11/2022	13:54	Buzzard	1	186	0	0	186	0	cutover bog; travelling	NM
-	VP9	18/11/2022	14:38	Redwing	6	15	10	5	0	0	scrub; flight	MW
-	VP9	18/11/2022	15:41	Mallard	1	70	0	0	70	0	cutover bog; flyover, other larger duck species possible	MW
-	VP9	18/11/2022	15:56	Meadow Pipit	1	20	20	0	0	0	cutover bog; flew to tree	MW
SN306	VP9	18/11/2022	17:15	Snipe	1	10	10	0	0	0	cutover bog; flight	MW
-	VP10	21/11/2022	12:00	Mute Swan	1	50	0	45	5	0	cutover bog and scrub; flyover	MW
BZ1035	VP10	21/11/2022	12:58	Buzzard	1	20	0	20	0	0	improved agricultural grassland; circling	MW
-	VP10	21/11/2022	13:10	Black-headed Gull	2	50	0	40	10	0	improved agricultural grassland; flight, gull species uncertain	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP10	21/11/2022	13:24	Black-headed Gull	1	5	0	5	0	0	improved agricultural grassland and conifer plantation; flight, uncertain gull species	MW
K643	VP10	21/11/2022	15:18	Kestrel	1	10	0	10	0	0	cutover bog; hovering then flight, disappeared	MW
-	VP10	21/11/2022	15:32	Lesser Black-backed Gull	1	10	10	0	0	0	scrub; flight, lb or hg	Name
ML022	VP10	21/11/2022	16:21	Merlin	1	40	40	0	0	0	cutover bog; low flight, briefly landed on bog then continued off	MW
K644	VP15	22/11/2022	11:35	Kestrel	1	5	5	0	0	0	cutover bog and scrub; flying/landed, landed in birch tree	EF
K645	VP15	22/11/2022	11:40	Kestrel	1	55	7	48	0	0	cutover bog and scrub; flying/hovering, lost into mist	EF
K646	VP15	22/11/2022	12:35	Kestrel	1	78	5	20	53	0	cutover bog and scrub; flying/hovering, dropped out of view	EF
K647	VP15	22/11/2022	13:10	Kestrel	1	31	4	27	0	0	cutover bog and scrub; flying, flew low out of view	EF
K648	VP15	22/11/2022	15:25	Kestrel	1	104	20	0	84	0	cutover bog and scrub; flying/hovering, dropped out of view	EF
-	VP15	22/11/2022	15:35	Meadow Pipit	2	5	5	0	0	0	cutover bog and scrub; flying/calling	EF
SH206	VP7	22/11/2022	11:27	Sparrowhawk	1	18	12	6	0	0	cutover bog and conifer plantation; travelling	NM
-	VP7	22/11/2022	16:00	Meadow Pipit	3	22	0	22	0	0	cutover bog; travelling	NM
-	VP10	23/11/2022	06:55	Redwing	9	5	5	0	0	0	cutover bog and bog woodland; heard calling, flying e	SP
-	VP10	23/11/2022	07:16	Redwing	7	5	5	0	0	0	cutover bog and bog woodland; flying SW, calling	SP
WK059	VP10	23/11/2022	07:20	Woodcock	1	5	5	0	0	0	cutover bog and bog woodland; flying w, very low over vp10	SP
-	VP10	23/11/2022	07:42	Redwing	5	5	5	0	0	0	cutover bog and bog woodland; flying e	SP
-	VP10	23/11/2022	07:47	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flying ne	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
SH207	VP10	23/11/2022	08:17	Sparrowhawk	1	15	15	0	0	0	cutover bog and bog woodland; flying NW, male circling/hunting	SP
-	VP10	23/11/2022	09:32	Cormorant	1	120	120	0	0	0	cutover bog and bog woodland; flying s, across VP arc	SP
SH208	VP10	23/11/2022	09:32	Sparrowhawk	1	5	5	0	0	0	cutover bog and bog woodland; flying NW , female being mobbed by hooded crows	SP
K649	VP10	23/11/2022	09:48	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; female flying SW, hunting	SP
-	VP10	23/11/2022	10:24	Lesser Black-backed Gull	1	5	5	0	0	0	cutover bog and bog woodland; low over bog NW of VP, possibly landed	SP
BZ1036	VP10	23/11/2022	10:30	Buzzard	1	780	780	0	0	0	cutover bog and bog woodland; soaring/circling, N of VP moving w	SP
PE096	VP10	23/11/2022	10:32	Peregrine Falcon	1	10	10	0	0	0	cutover bog and bog woodland; hunting female, N of VP	SP
BZ1037	VP10	23/11/2022	10:41	Buzzard	2	60	60	0	0	0	cutover bog and bog woodland; circling, moved W SW of VP	SP
-	VP10	23/11/2022	11:01	Meadow Pipit	1	5	3	0	0	0	cutover bog and bog woodland; flying n	SP
-	VP10	23/11/2022	11:26	Lesser Black-backed Gull	1	60	60	0	0	0	cutover bog and bog woodland; flying s, NW of VP	SP
GP306	VP10	23/11/2022	11:27	Golden Plover	2	5	5	0	0	0	cutover bog and bog woodland; flying s, across VP arc	SP
BZ1038	VP10	23/11/2022	11:31	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; moved N , mobbed by 2 ravens	SP
BZ1039	VP10	23/11/2022	11:51	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; moving NW	SP
K650	VP10	23/11/2022	11:55	Kestrel	1	20	20	0	0	0	cutover bog and bog woodland; female hunting, mobbed by hoodie flew n	SP
K651	VP10	23/11/2022	12:26	Kestrel	1	5	5	0	0	0	cutover bog and bog woodland; seen briefly, flew n	SP
-	VP10	23/11/2022	13:03	Redwing	100	15	15	0	0	0	cutover bog and bog woodland; flying NW	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP16	23/11/2022	09:55	Redwing	2	20	0	20	0	0	cutover bog and mixed broadleaved/conifer woodland; travelling	KS
GP307	VP16	23/11/2022	11:00	Golden Plover	21	60	0	0	60	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; circling	KS
L036	VP16	23/11/2022	11:59	Lapwing	30	30	0	0	30	0	improved agricultural grassland; circling	KS
SH209	VP16	23/11/2022	13:30	Sparrowhawk	1	30	0	30	0	0	cutover bog; travelling	KS
SH210	VP16	23/11/2022	14:01	Sparrowhawk	1	20	20	0	0	0	cutover bog and mixed broadleaved/conifer woodland; travelling, male	KS
L037	VP16	23/11/2022	15:29	Lapwing	45	120	0	0	120	0	improved agricultural grassland; circling	KS
BZ1040	VP16	23/11/2022	15:40	Buzzard	1	90	0	0	90	0	cutover bog and mixed broadleaved/conifer woodland; gliding	KS
L038	VP16	23/11/2022	15:45	Lapwing	35	80	0	0	80	0	cutover bog; travelling	KS
K652	VP16	23/11/2022	15:48	Kestrel	1	45	0	0	45	0	cutover bog; mobbed	KS
-	VP3	30/11/2022	11:04	Meadow Pipit	15	20	20	0	0	0	cutover bog; flight	MW
K653	VP3	30/11/2022	11:30	Kestrel	1	120	30	90	0	0	cutover bog; hunting	MW
WS118	VP3	30/11/2022	12:11	Whooper Swan	6	45	45	0	0	0	cutover bog; flight, continued as incidental record	MW
K654	VP3	30/11/2022	12:45	Kestrel	1	570	120	450	0	0	cutover bog; hunting, flight ended with perching on radio tower	MW
K655	VP3	30/11/2022	12:47	Kestrel	1	50	25	25	0	0	cutover bog; hunting, flew to radio tower at end	MW
K656	VP3	30/11/2022	12:58	Kestrel	1	330	60	270	0	0	cutover bog; hunting	MW
K657	VP3	30/11/2022	15:28	Kestrel	1	215	45	170	0	0	cutover bog; hunting, female	MW
-	VP3	30/11/2022	15:37	Mallard	1	15	5	10	0	0	cutover bog; flight	MW
GP308	VP3	30/11/2022	15:53	Golden Plover	200	40	0	40	0	0	cutover bog; flight	MW

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BO005	VP3	30/11/2022	17:45	Barn Owl	1	10	10	0	0	0	cutover bog; flight	MW
WK060	VP5	01/12/2022	17:05	Woodcock	1	14	2	12	0	0	conifer plantation and cutover bog; travelling	NM
K658	VP8	02/12/2022	12:04	Kestrel	1	48	2	46	0	0	cutover bog; travelling, perched on young conifer	NM
K659	VP8	02/12/2022	12:33	Kestrel	1	126	18	108	0	0	cutover bog and conifer plantation; hunting	NM
SN307	VP8	02/12/2022	12:34	Snipe	1	14	14	0	0	0	cutover bog; flushed flight	NM
GP309	VP11	05/12/2022	08:53	Golden Plover	3	155	5	20	130	0	cutover bog; circling bog - dropped down to ground	KB
GP310	VP11	05/12/2022	09:06	Golden Plover	3	40	5	10	25	0	cutover bog; flushed by digger	KB
BZ1041	VP11	05/12/2022	09:45	Buzzard	1	5	5	0	0	0	conifer plantation and cutover bog; foraging - landed on ESB pole	KB
-	VP11	05/12/2022	10:00	Mallard	2	180	10	20	90	60	cutover bog; travelling	KB
ET002	VP11	05/12/2022	12:27	Little Egret	1	40	0	0	40	0	cutover bog; travelling	KB
K660	VP11	05/12/2022	12:32	Kestrel	1	300	30	30	240	0	mixed broadleaved woodland; foraging	KB
WS119	VP11	05/12/2022	13:09	Whooper Swan	5	50	0	0	50	0	cutover bog; travelling	KB
-	VP2	06/12/2022	07:32	Redwing	2	5	5	0	0	0	cutover bog and bog woodland; heard calling, flying east	SP
GP311	VP2	06/12/2022	07:35	Golden Plover	25	5	5	0	0	0	cutover bog and bog woodland; heard calling, estimated number	SP
-	VP2	06/12/2022	07:40	Redwing	2	5	5	0	0	0	cutover bog and bog woodland; heard calling, flying east	SP
-	VP2	06/12/2022	08:51	Redwing	5	5	5	0	0	0	cutover bog and bog woodland; flying n over trees west of VP	SP
WS120	VP2	06/12/2022	09:17	Whooper Swan	4	180	0	180	0	0	cutover bog and bog woodland; flying s, 2 adults 2 immatures	SP
GP312	VP2	06/12/2022	09:34	Golden Plover	200	60	0	0	60	0	cutover bog and bog woodland; circling/milling, NW of VP outside arc	SP
SH211	VP2	06/12/2022	09:40	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; female hunting, flew W	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K661	VP2	06/12/2022	10:30	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; flying ne	SP
PE097	VP2	06/12/2022	10:45	Peregrine Falcon	1	60	60	0	0	0	cutover bog and bog woodland; flying n , low along road edge	SP
BZ1042	VP2	06/12/2022	11:02	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; flying e, south edge of VP arc	SP
K662	VP2	06/12/2022	11:10	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; hunting, SW edge of VP arc	SP
ML023	VP2	06/12/2022	11:15	Merlin	1	60	60	0	0	0	cutover bog and bog woodland; hunting female, flew from SW to ne across VP arc	SP
K663	VP2	06/12/2022	11:27	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; hunting, along south edge flew east	SP
BZ1043	VP2	06/12/2022	11:50	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flying low se, over the open bogland	SP
GP313	VP2	06/12/2022	11:52	Golden Plover	450	30	0	0	30	0	cutover bog and bog woodland; flying east, high over vp2	SP
GP314	VP2	06/12/2022	12:08	Golden Plover	30	60	0	0	60	0	cutover bog and bog woodland; circling/wheeling, descended west of trees west of vp2	SP
BZ1044	VP2	06/12/2022	12:18	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; flying west low , south edge of VP arc	SP
K664	VP2	06/12/2022	12:25	Kestrel	2	180	180	0	0	0	cutover bog and bog woodland; 2 birds hunting, 1 in S corner 1 in SW corner of VP arc	SP
-	VP2	06/12/2022	12:40	Meadow Pipit	4	10	10	0	0	0	cutover bog and bog woodland; , flying n	SP
GP315	VP2	06/12/2022	13:00	Golden Plover	10	10	10	0	0	0	cutover bog and bog woodland; dropping onto bogland, west of VP south of aerial	SP
WS121	VP6	07/12/2022	08:55	Whooper Swan	2	182	0	0	182	0	improved agricultural grassland; travelling, pair observed travelling towards site	NM

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP316	VP6	07/12/2022	09:22	Golden Plover	52	194	0	0	194	0	improved agricultural grassland; display flight	NM
WS122	VP6	07/12/2022	10:03	Whooper Swan	2	318	0	276	42	0	cutover bog and improved agricultural grassland; travelling south	NM
K665	VP6	07/12/2022	12:04	Kestrel	1	174	42	132	0	0	cutover bog and conifer plantation; hunting	NM
SH212	VP6	07/12/2022	12:08	Sparrowhawk	1	4	4	0	0	0	cutover bog and conifer plantation; chasing kestrel, large female disturbs kestrel over prey item	NM
L039	VP6	07/12/2022	12:21	Lapwing	36	58	21	37	0	0	improved agricultural grassland; travelling	NM
K666	VP6	07/12/2022	12:24	Kestrel	1	543	0	49	484	0	improved agricultural grassland and cutover bog; hunting/mobbing, bird observed hunting then mobbed raven	NM
L040	VP6	07/12/2022	12:57	Lapwing	43	124	12	112	0	0	improved agricultural grassland; display flight	NM
GP317	VP6	07/12/2022	13:24	Golden Plover	156	608	0	0	608	0	improved agricultural grassland; display flight	NM
GP318	VP12	08/12/2022	08:32	Golden Plover	31	240	0	0	150	90	cutover bog; flying over/circling	KB
BZ1045	VP12	08/12/2022	10:13	Buzzard	1	5	5	0	0	0	cutover bog and conifer plantation; flew into trees to perch	KB
PE098	VP12	08/12/2022	10:24	Peregrine Falcon	1	150	0	10	70	70	cutover bog; foraging, flying over	KB
GP319	VP12	08/12/2022	10:24	Golden Plover	1	10	2	3	5	0	cutover bog; flushed by pe, mobbing pe	KB
K667	VP12	08/12/2022	11:08	Kestrel	1	240	0	60	180	0	cutover bog and conifer plantation; foraging and hovering	KB
GP320	VP12	08/12/2022	11:09	Golden Plover	50	30	0	0	30	0	mixed broadleaved woodland and cutover bog; flying over	KB
GP321	VP12	08/12/2022	12:12	Golden Plover	50	40	0	0	40	0	mixed broadleaved woodland and cutover bog; flying over	KB
GP322	VP12	08/12/2022	12:13	Golden Plover	110	420	0	0	300	120	mixed broadleaved woodland and cutover bog; 2nd flock of 60 GP joined first flock of 50 - flying over/circling	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
PE099	VP12	08/12/2022	12:18	Peregrine Falcon	1	25	0	5	20	0	cutover bog and immature woodland; foraging	KB
PE100	VP12	08/12/2022	12:34	Peregrine Falcon	1	140	0	5	105	30	cutover bog and immature woodland; foraging	KB
BZ1046	VP12	08/12/2022	13:27	Buzzard	1	660	0	0	360	300	cutover bog; soaring	KB
ML024	VP12	08/12/2022	13:35	Merlin	1	8	8	0	0	0	cutover bog and scrub; foraging - landed in tree to perch	KB
ML025	VP12	08/12/2022	13:36	Merlin	1	12	5	7	0	0	scrub and cutover bog; took up foraging, mobbed by HC	KB
-	VP13	18/12/2022	08:11	Grey Heron	1	50	0	50	0	0	cutover bog; travelling	KB
ML026	VP13	18/12/2022	09:16	Merlin	1	10	10	0	0	0	cutover bog and scrub; foraging	KB
PE101	VP13	18/12/2022	10:34	Peregrine Falcon	1	25	20	5	0	0	cutover bog, scrub and immature woodland; adult flying with second pe (juvenile), interacting in flight - adult bird lost from view, adult	KB
PE102	VP13	18/12/2022	10:34	Peregrine Falcon	1	60	20	10	30	0	cutover bog, scrub and immature woodland; juvenile interacting with adult in flight - adult disappeared from view and juvenile rose higher in the sky heading west, juvenile	KB
GP323	VP13	18/12/2022	10:34	Golden Plover	3	6	3	3	0	0	cutover bog; flushed by peregrines	KB
PE103	VP13	18/12/2022	10:35	Peregrine Falcon	1	5	5	0	0	0	cutover bog; adult reappeared in front of VP, landed on ground calling, adult	KB
PE104	VP13	18/12/2022	10:35	Peregrine Falcon	1	4	4	0	0	0	cutover bog; adult took up and landed back down, adult	KB
PE105	VP13	18/12/2022	10:39	Peregrine Falcon	1	7	7	0	0	0	cutover bog and scrub; took up heading east - dropped down and lost from view, adult	KB
K668	VP13	18/12/2022	11:12	Kestrel	2	15	0	2	13	0	conifer plantation and cutover bog; foraging - one bird directly following the other	KB
K669	VP13	18/12/2022	11:16	Kestrel	1	30	0	5	25	0	cutover bog; foraging and hovering	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
PE106	VP13	18/12/2022	11:25	Peregrine Falcon	1	10	5	5	0	0	cutover bog; juvenile flew towards adult and landed on bog, juvenile	KB
PE107	VP13	18/12/2022	11:25	Peregrine Falcon	1	8	8	0	0	0	cutover bog; adult flew towards juvenile and landed on bog, adult	KB
PE108	VP13	18/12/2022	11:47	Peregrine Falcon	2	10	6	4	0	0	cutover bog; took up and headed south, adult and juvenile	KB
-	VP4	20/12/2022	07:44	Redwing	2	10	10	0	0	0	cutover bog, bog woodland and drainage ditches; heard calling, flying east	SP
GP324	VP4	20/12/2022	10:26	Golden Plover	2	10	0	0	10	0	cutover bog and bog woodland; heard calling, flying east high over VP	SP
BZ1047	VP4	20/12/2022	11:36	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; seen briefly, over trees east of VP	SP
BZ1048	VP4	20/12/2022	11:44	Buzzard	1	180	180	0	0	0	cutover bog and bog woodland; hunting moving s, se of vp4	SP
-	VP16	29/12/2022	08:15	Meadow Pipit	1	5	5	0	0	0	heath and scrub; fly/land/calling	EF
L041	VP16	29/12/2022	08:55	Lapwing	20	45	0	0	45	0	heath and scrub; flying	EF
BZ1049	VP16	28/12/2022	09:25	Buzzard	1	12	12	0	0	0	heath and scrub; fly/land	EF
BZ1050	VP16	28/12/2022	09:30	Buzzard	1	4	4	0	0	0	heath and scrub; flew from tree out of view	EF
-	VP16	29/12/2022	09:30	Redwing	5	10	0	10	0	0	heath and scrub; flying	EF
BZ1051	VP16	28/12/2022	10:10	Buzzard	1	25	0	25	0	0	heath and scrub; circling	EF
-	VP16	29/12/2022	11:40	Lesser Black-backed Gull	1	5	0	0	5	0	heath and scrub; circling. seen briefly	EF
PE109	VP16	29/12/2022	12:05	Peregrine Falcon	2	25	0	5	20	0	heath and scrub; flying interacting together	EF
BZ1052	VP16	28/12/2022	12:35	Buzzard	1	9	9	0	0	0	heath and scrub; fly/land in tree, didn't see leave	EF
PE110	VP16	29/12/2022	13:00	Peregrine Falcon	1	8	8	0	0	0	heath and scrub; fly/land/fly, landed on ground. then flew low lost in scrub	EF
BZ1053	VP16	28/12/2022	13:45	Buzzard	1	29	29	0	0	0	heath and scrub; flying/went into scrub	EF

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
SH213	VP14	03/01/2023	08:18	Sparrowhawk	1	30	5	15	10	0	cutover bog and immature woodland; travelling/foraging - mobbed by HC	KB
PE111	VP14	03/01/2023	08:40	Peregrine Falcon	1	10	0	5	5	0	cutover bog and immature woodland; foraging	KB
GP325	VP14	03/01/2023	08:46	Golden Plover	20	120	0	0	120	0	cutover bog; flying over	KB
GP326	VP14	03/01/2023	09:10	Golden Plover	19	240	0	0	240	0	cutover bog; flying over	KB
ML027	VP14	03/01/2023	11:58	Merlin	1	8	8	0	0	0	cutover bog and scrub; foraging	KB
SN308	VP5	06/01/2023	07:34	Snipe	8	5	5	0	0	0	cutover bog and bog woodland; heard calling, flying east	SP
-	VP5	06/01/2023	09:47	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flying east over vp5	SP
K670	VP5	06/01/2023	12:19	Kestrel	1	5	5	0	0	0	cutover bog and bog woodland; seen briefly, flying s very low	SP
BZ1054	VP7	09/01/2023	11:15	Buzzard	2	240	0	240	0	0	cutover bog and bog woodland; circling/hunting, moving ne over bog gaining height	SP
BZ1055	VP7	09/01/2023	12:30	Buzzard	2	120	120	0	0	0	cutover bog and bog woodland; soaring/circling, moved NW	SP
GP327	VP7	09/01/2023	12:40	Golden Plover	250	180	0	0	180	0	cutover bog and bog woodland; milling/circling, moved NW towards Clonleame	SP
ML028	VP7	09/01/2023	13:25	Merlin	1	60	0	60	0	0	cutover bog and bog woodland; male flying east	SP
-	VP7	09/01/2023	14:32	Meadow Pipit	1	5	5	0	0	0	cutover bog and bog woodland; flew SW	SP
SN309	VP7	09/01/2023	16:58	Snipe	5	5	5	0	0	0	cutover bog and bog woodland; heard calling, flying ne	SP
SN310	VP15	11/01/2023	07:58	Snipe	2	4	4	0	0	0	cutover bog; flushed	KB
-	VP15	11/01/2023	09:21	Buzzard	1	20	5	15	0	0	mixed broadleaved woodland; soaring	KB
WK061	VP15	11/01/2023	10:34	Woodcock	1	6	6	0	0	0	immature woodland; flushed	KB
BZ1056	VP6	11/01/2023	11:26	Buzzard	1	60	0	0	60	0		KS
BZ1057	VP6	11/01/2023	13:25	Buzzard	1	45	0	0	45	0	cutover bog; soaring, mobbed	KS

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K671	VP6	11/01/2023	16:00	Kestrel	1	20	0	20	0	0	cutover bog; hunting	KS
L042	VP6	11/01/2023	16:09	Lapwing	200	900	0	200	700	0	cutover bog and improved agricultural grassland; circling	KS
-	VP6	11/01/2023	17:20	Teal	1	20	20	0	0	0	cutover bog; travelling	KS
SN311	VP6	11/01/2023	17:25	Snipe	3	20	20	0	0	0	cutover bog; calling	KS
GP328	VP6	11/01/2023	17:25	Golden Plover	2	10	10	0	0	0	cutover bog; calling	KS
-	VP2	16/01/2023	12:00	Meadow Pipit	1	5	5	0	0	0	cutover bog, mixed broadleaved/conifer woodland and buildings and artificial surfaces; heard only	EOB
K672	VP2	16/01/2023	12:05	Kestrel	1	70	0	0	70	0	cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
K673	VP2	16/01/2023	12:36	Kestrel	1	40	5	35	0	0	mixed broadleaved/conifer woodland, cutover bog and improved agricultural grassland; hunting	EOB
-	VP2	16/01/2023	13:06	Meadow Pipit	1	55	0	55	0	0	cutover bog; flying	EOB
BZ1058	VP2	16/01/2023	13:36	Buzzard	2	140	0	140	0	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting	EOB
-	VP2	16/01/2023	15:14	Mute Swan	4	250	0	0	250	0	improved agricultural grassland, mixed broadleaved/conifer woodland and cutover bog; flying, some uncertainty but a swan species	EOB
K674	VP2	16/01/2023	15:20	Kestrel	1	20	20	0	0	0	cutover bog; hunting a meadow pipit	EOB
-	VP2	16/01/2023	15:20	Meadow Pipit	1	15	10	5	0	0	cutover bog; evading kestrel, alarm call	EOB
SN312	VP2	16/01/2023	17:01	Snipe	1	10	10	0	0	0	cutover bog and buildings and artificial surfaces; flying	EOB
SN313	VP3	17/01/2023	11:23	Snipe	1	15	5	10	0	0	cutover bog; flushed flying	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K675	VP3	17/01/2023	13:14	Kestrel	1	270	15	10	245	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting	EOB
K676	VP3	17/01/2023	13:17	Kestrel	1	978	20	300	658	0	cutover bog and mixed broadleaved/conifer woodland; hunting, female	EOB
K677	VP3	17/01/2023	15:02	Kestrel	1	1164	25	500	639	0	cutover bog; hunting	EOB
K678	VP3	17/01/2023	15:18	Kestrel	1	490	20	100	370	0	cutover bog and mixed broadleaved/conifer woodland; hunting, female	EOB
K679	VP3	17/01/2023	16:34	Kestrel	1	45	0	45	0	0	mixed broadleaved/conifer woodland and cutover bog; hunting	EOB
-	VP4	20/01/2023	11:15	Mallard	1	35	0	0	35	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; flying	EOB
K680	VP4	20/01/2023	13:31	Kestrel	1	45	0	0	45	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting, tree line interference	EOB
SH214	VP4	20/01/2023	13:52	Sparrowhawk	1	145	0	0	145	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; hunting	EOB
K681	VP4	20/01/2023	14:58	Kestrel	1	260	0	0	260	0	cutover bog and improved agricultural grassland; hunting	EOB
K682	VP4	20/01/2023	15:00	Kestrel	1	70	0	0	70	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting, tree line interference	EOB
SN314	VP4	20/01/2023	17:15	Snipe	1	10	10	0	0	0	cutover bog and immature woodland; flying	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP5	23/01/2023	11:23	Meadow Pipit	1	25	25	0	0	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flitting	EOB
K683	VP5	23/01/2023	15:09	Kestrel	1	1278	200	200	878	0	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; hunting, female	EOB
K684	VP5	23/01/2023	15:30	Kestrel	1	260	10	10	240	0	cutover bog and mixed broadleaved/conifer woodland; hunting, male	EOB
-	VP16	26/01/2023	11:35	Teal	2	8	0	0	8	0	heath and scrub; direct flight, lost behind birch scrub	EF
-	VP16	26/01/2023	11:40	Meadow Pipit	3	6	6	0	0	0	heath and scrub; fly/land	EF
GP329	VP8	26/01/2023	12:17	Golden Plover	7	60	0	60	0	0	cutover bog and bog woodland; flying	SP
-	VP16	26/01/2023	12:25	Lesser Black-backed Gull	1	12	0	0	12	0	heath and scrub; flying, dipped below tree line	EF
K685	VP16	26/01/2023	12:30	Kestrel	1	5	5	0	0	0	heath and scrub; fly/land in birch tree, male	EF
K686	VP16	26/01/2023	12:55	Kestrel	1	3	3	0	0	0	heath and scrub; flew low from birch tree, flew out of view	EF
-	VP16	26/01/2023	14:10	Lesser Black-backed Gull	1	55	0	0	55	0	heath and scrub; direct flight	EF
L043	VP16	26/01/2023	14:15	Lapwing	90	226	0	6	220	0	heath and scrub; circling/going low, lost behind treeline	EF
L043	VP16	26/01/2023	14:30	Lapwing	60	80	0	0	80	0	heath and scrub; circling, left to follow flock of golden plover	EF
GP330	VP16	26/01/2023	14:30	Golden Plover	26	175	0	0	175	0	heath and scrub; flying/circling, good scope views	EF
L044	VP16	26/01/2023	15:35	Lapwing	60	191	0	6	185	0	heath and scrub; circling/going low, lost behind treeline	EF
-	VP16	26/01/2023	15:45	Grey Heron	1	87	0	7	80	0	heath and scrub; direct flight going low, lost in scrub	EF

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K687	VP8	26/01/2023	16:14	Kestrel	1	45	45	0	0	0	cutover bog and bog woodland; hunting low, moving NW over bog	SP
BZ1059	VP8	26/01/2023	16:16	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; low over trees, moving NW	SP
L045	VP16	26/01/2023	16:30	Lapwing	24	15	0	0	15	0	heath and scrub; direct flight	EF
-	VP8	26/01/2023	16:52	Meadow Pipit	5	15	15	0	0	0	cutover bog and bog woodland; flying SW	SP
SN315	VP8	26/01/2023	17:15	Snipe	3	10	10	0	0	0	cutover bog and bog woodland; flying ne over VP, calling	SP
LE004	VP16	26/01/2023	17:30	Long-eared Owl	1	4	4	0	0	0	heath and scrub; flying	EF
LE005	VP16	26/01/2023	17:45	Long-eared Owl	1	5	5	0	0	0	heath and scrub; flying	EF
SH215	VP1	26/01/2023	12:43	Sparrowhawk	1	35	0	35	0	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; hunting	EOB
PE112	VP6	26/01/2023	12:49	Peregrine Falcon	1	-	-	-	-	-	bogs and eroding blanket bog; perched	FLM
PE113	VP6	26/01/2023	12:50	Peregrine Falcon	1	-	-	-	-	-	bogs and eroding blanket bog; perched/ grooming	FLM
GP331	VP6	26/01/2023	12:53	Golden Plover	6	-	-	-	-	-	bogs and eroding blanket bog; roosting	FLM
K688	VP12	26/01/2023	13:42	Kestrel	1	380	0	0	380	0	bogs and eroding blanket bog; hunting	FLM
SN316	VP1	26/01/2023	17:20	Snipe	1	10	10	0	0	0	cutover bog and drainage ditches; flying	EOB
BZ1060	VP9	31/01/2023	11:52	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; seen briefly, flying NW over trees	SP
-	VP9	31/01/2023	13:48	Cormorant	1	30	30	0	0	0	cutover bog and bog woodland; flying w over trees, NW of vp9	SP
BZ1061	VP9	31/01/2023	16:07	Buzzard	1	240	240	0	0	0	cutover bog and bog woodland; flying slowly SW, NW of VP flew SW	SP
BZ1062	VP9	31/01/2023	16:25	Buzzard	2	120	120	0	0	0	cutover bog and bog woodland; soaring/circling, over trees n of VP	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP9	31/01/2023	17:01	Redwing	30	10	10	0	0	0	cutover bog and bog woodland; dropping into trees roosting flight, NW of VP	SP
ML029	VP9	31/01/2023	17:09	Merlin	1	20	20	0	0	0	cutover bog and bog woodland; flying fast south, SW edge of VP arc	SP
SH216	VP1	02/02/2023	08:05	Sparrowhawk	2	35	0	0	35	0	mixed broadleaved/conifer woodland, cutover bog and drainage ditches; commuting hunting	EOB
-	VP1	02/02/2023	08:16	Meadow Pipit	1	20	20	0	0	0	cutover bog and drainage ditches; flitting	EOB
SH217	VP1	02/02/2023	08:29	Sparrowhawk	1	110	10	50	50	0	cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
SH218	VP1	02/02/2023	08:41	Sparrowhawk	1	20	20	0	0	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; hunting	EOB
K689	VP1	02/02/2023	09:06	Kestrel	1	45	0	5	40	0	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
BZ1063	VP1	02/02/2023	12:09	Buzzard	1	45	0	15	30	0	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; soaring circling	EOB
-	VP2	07/02/2023	08:03	Redwing	39	35	0	35	0	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; flying commuting	EOB
-	VP2	07/02/2023	08:46	Meadow Pipit	1	35	10	25	0	0	cutover bog, buildings and artificial surfaces and mixed broadleaved/conifer woodland; flitting	EOB
K690	VP2	07/02/2023	12:45	Kestrel	1	195	10	80	105	0	mixed broadleaved/conifer woodland and cutover bog; hunting, perched for 90 seconds	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1064	VP2	07/02/2023	12:48	Buzzard	1	210	0	0	210	0	improved agricultural grassland and cutover bog; soaring	EOB
-	VP3	08/02/2023	07:13	Mallard	1	25	5	20	0	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flying	EOB
SN317	VP3	08/02/2023	07:23	Snipe	1	22	4	10	8	0	cutover bog; flying	EOB
-	VP3	08/02/2023	08:00	Redwing	108	75	10	30	35	0	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; flying	EOB
K691	VP3	08/02/2023	08:17	Kestrel	1	35	0	5	30	0	cutover bog, conifer plantation and drainage ditches; flying hunting	EOB
-	VP3	08/02/2023	08:31	Lesser Black-backed Gull	27	145	15	10	120	0	improved agricultural grassland, mixed broadleaved/conifer woodland and cutover bog; flying, juveniles present	EOB
-	VP3	08/02/2023	08:33	Lesser Black-backed Gull	15	95	0	5	90	0	improved agricultural grassland, cutover bog and drainage ditches; flying	EOB
BZ1065	VP3	08/02/2023	08:38	Buzzard	1	35	0	0	35	0	improved agricultural grassland, mixed broadleaved/conifer woodland and cutover bog; hunting	EOB
-	VP3	08/02/2023	09:01	Great Black-backed Gull	1	125	0	0	125	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flying	EOB
BZ1066	VP3	08/02/2023	09:31	Buzzard	2	75	0	20	55	0	cutover bog and improved agricultural grassland; hunting	EOB
-	VP3	08/02/2023	09:44	Lesser Black-backed Gull	18	200	0	0	200	0	improved agricultural grassland, mixed broadleaved/conifer woodland and cutover bog; soaring flying	EOB
-	VP3	08/02/2023	11:07	Lesser Black-backed Gull	4	40	5	35	0	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; soaring	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K692	VP3	08/02/2023	11:18	Kestrel	1	685	300	200	185	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; hunting	EOB
K693	VP3	08/02/2023	11:29	Kestrel	1	20	0	20	0	0	cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
K694	VP3	08/02/2023	11:57	Kestrel	1	740	200	520	20	0	cutover bog, conifer plantation and mixed broadleaved/conifer woodland; hunting	EOB
-	VP3	08/02/2023	12:12	Lesser Black-backed Gull	3	55	0	0	55	0	improved agricultural grassland and cutover bog; soaring	EOB
K695	VP3	08/02/2023	13:14	Kestrel	1	265	20	200	45	0	cutover bog and conifer plantation; hunting	EOB
BZ1067	VP12	09/02/2023	07:30	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; flying SW calling, close to VP	SP
K696	VP12	09/02/2023	08:06	Kestrel	1	300	300	0	0	0	cutover bog and bog woodland; hunting moving w, Screggan	SP
BZ1068	VP12	09/02/2023	08:10	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flew north	SP
BZ1069	VP12	09/02/2023	08:14	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flew n into trees	SP
K697	VP12	09/02/2023	08:19	Kestrel	1	1440	1440	0	0	0	cutover bog and bog woodland; moving west hunting, male	SP
K698	VP12	09/02/2023	09:16	Kestrel	1	20	20	0	0	0	cutover bog and bog woodland; flew into trees, ne of VP	SP
K699	VP12	09/02/2023	09:25	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; flew w hunting, male perhaps same individual as previous flight	SP
GP332	VP12	09/02/2023	09:36	Golden Plover	6	20	20	0	0	0	cutover bog and bog woodland; flying se, in front of VP 12	SP
BZ1070	VP12	09/02/2023	11:11	Buzzard	1	360	0	360	0	0	cutover bog and bog woodland; soaring/circling, moved se quite high	SP
BZ1071	VP12	09/02/2023	11:22	Buzzard	1	15	15	0	0	0	cutover bog and bog woodland; flew NW	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP12	09/02/2023	11:59	Redwing	150	60	60	0	0	0	cutover bog and bog woodland; flying over trees, Carranstown great	SP
BZ1072	VP12	09/02/2023	12:12	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; moved e-se, flying rapidly	SP
BZ1073	VP12	09/02/2023	12:42	Buzzard	1	60	0	60	0	0	cutover bog and bog woodland; soaring/circling, gained height flew east	SP
K700	VP12	09/02/2023	12:43	Kestrel	1	600	0	600	0	0	cutover bog and bog woodland; hunting female, moves slowly SW over bog	SP
K701	VP12	09/02/2023	12:55	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; moving west	SP
GP333	VP13	10/02/2023	07:10	Golden Plover	5	10	10	0	0	0	cutover bog and bog woodland; heard calling, flying se	SP
-	VP13	10/02/2023	07:15	Teal	4	10	10	0	0	0	cutover bog and bog woodland; heard calling, flying SW	SP
-	VP13	10/02/2023	09:04	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flew s over VP	SP
GP334	VP13	10/02/2023	09:20	Golden Plover	35	10	10	0	0	0	cutover bog and bog woodland; flew very low past VP, flew south	SP
-	VP13	10/02/2023	11:40	Redwing	50	10	10	0	0	0	cutover bog and bog woodland; flying over trees, flew east	SP
BZ1074	VP13	10/02/2023	12:01	Buzzard	1	2	2	0	0	0	cutover bog and bog woodland; seen briefly, flew into trees ne of VP	SP
SH219	VP13	10/02/2023	12:05	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; flying over trees, female hunting flew east	SP
K702	VP13	10/02/2023	12:09	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; flying SW over bog, male hunting	SP
BZ1075	VP13	10/02/2023	12:38	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; circling briefly, over trees n of VP	SP
SH220	VP13	10/02/2023	12:40	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; circling over trees, east of VP flew east	SP
K703	VP13	10/02/2023	13:05	Kestrel	1	180	180	0	0	0	cutover bog and bog woodland; flying west hunting	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
SN318	VP11	13/02/2023	07:05	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; heard calling, flying east	SP
-	VP11	13/02/2023	07:55	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flying west	SP
-	VP11	13/02/2023	08:01	Herring Gull	1	15	15	0	0	0	cutover bog and bog woodland; flying east	SP
-	VP11	13/02/2023	08:45	Meadow Pipit	3	10	10	0	0	0	cutover bog and bog woodland; flying west	SP
BZ1076	VP11	13/02/2023	08:45	Buzzard	1	5	5	0	0	0	cutover bog and bog woodland; flying into trees, near the level crossing	SP
-	VP11	13/02/2023	09:50	Mallard	1	10	10	0	0	0	cutover bog and bog woodland; male flying, landed again same area	SP
BZ1077	VP11	13/02/2023	09:59	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flew NW into trees, from SW corner flew NW	SP
BZ1078	VP11	13/02/2023	10:36	Buzzard	1	15	15	0	0	0	cutover bog and bog woodland; circling/soaring, briefly over trees w of VP flew n	SP
PE114	VP11	13/02/2023	11:20	Peregrine Falcon	1	60	60	0	0	0	cutover bog and bog woodland; flying over trees, s of VP flew east	SP
K704	VP11	13/02/2023	12:24	Kestrel	1	300	300	0	0	0	cutover bog and bog woodland; hunting east of VP, moved slowly south mobbing buzzard	SP
BZ1079	VP11	13/02/2023	12:25	Buzzard	1	300	300	0	0	0	cutover bog and bog woodland; circling/soaring, dropped into trees se of VP	SP
BZ1080	VP11	13/02/2023	12:30	Buzzard	2	30	30	0	0	0	cutover bog and bog woodland; soaring/circling, briefly e of VP moved ne	SP
BZ1081	VP11	13/02/2023	12:40	Buzzard	3	360	360	0	0	0	cutover bog and bog woodland; soaring/circling, remained low over trees in se then slowly moved south.	SP
-	VP9	15/02/2023	06:55	Mallard	2	8	8	0	0	0	cutover bog; travelling	KB
ML030	VP9	15/02/2023	07:22	Merlin	1	4	4	0	0	0	cutover bog; flying	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
PE115	VP9	15/02/2023	10:18	Peregrine Falcon	1	5	5	0	0	0	cutover bog and scrub; hunting, juvenile - chasing a mallard, landed in a tree, calling	KB
-	VP9	15/02/2023	10:18	Mallard	1	3	3	0	0	0	cutover bog; flying, flew into a drain	KB
PE116	VP9	15/02/2023	10:20	Peregrine Falcon	1	12	6	6	0	0	cutover bog; flying, took up from perch, mobbed by hooded crow	KB
K705	VP9	15/02/2023	11:01	Kestrel	1	4	4	0	0	0	cutover bog and scrub; foraging	KB
K706	VP9	15/02/2023	11:13	Kestrel	1	8	8	0	0	0	cutover bog and immature woodland; foraging, adult male, dropped low	KB
K707	VP9	15/02/2023	11:18	Kestrel	1	20	10	10	0	0	cutover bog, immature woodland and mixed broadleaved/conifer woodland; foraging and hovering	KB
BZ1082	VP9	15/02/2023	12:33	Buzzard	1	40	0	5	35	0	immature woodland and cutover bog; soaring	KB
-	VP4	15/02/2023	08:13	Meadow Pipit	1	20	10	10	0	0	cutover bog and mixed broadleaved/conifer woodland; flitting	EOB
-	VP4	15/02/2023	09:06	Mallard	2	45	35	10	0	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flying then landed	EOB
BZ1083	VP4	15/02/2023	10:55	Buzzard	3	8100	0	1800	5700	600	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; circling soaring, 1 buzzard outside 500m buffer	EOB
SH221	VP4	15/02/2023	12:02	Sparrowhawk	1	55	0	25	30	0	improved agricultural grassland and cutover bog; hunting	EOB
BZ1084	VP4	15/02/2023	12:17	Buzzard	1	45	10	30	5	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting	EOB
SH222	VP4	15/02/2023	13:00	Sparrowhawk	1	40	0	30	10	0	cutover bog and mixed broadleaved/conifer woodland; harassed by corvid, flying	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
SN319	VP8	17/02/2023	07:02	Snipe	1	6	6	0	0	0	cutover bog and immature woodland; flushed	KB
-	VP15	17/02/2023	08:14	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flying SW	SP
-	VP15	17/02/2023	08:34	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flying s	SP
-	VP15	17/02/2023	09:33	Meadow Pipit	2	15	15	0	0	0	cutover bog and bog woodland; flying s	SP
SN320	VP8	17/02/2023	10:12	Snipe	1	5	5	0	0	0	cutover bog; flushed	KB
PE117	VP15	17/02/2023	11:48	Peregrine Falcon	1	20	20	0	0	0	cutover bog and bog woodland; flying SW, male	SP
BZ1085	VP15	17/02/2023	12:10	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; flying n, low over trees se of VP	SP
-	VP15	17/02/2023	12:20	Redwing	20	10	10	0	0	0	cutover bog and bog woodland; flying SW, low over trees se of VP	SP
BZ1086	VP8	17/02/2023	14:28	Buzzard	1	40	0	10	30	0	cutover bog and immature woodland; soaring	KB
SN321	VP16	18/02/2023	06:50	Snipe	1	2	2	0	0	0	heath and scrub; flight call	EF
-	VP16	18/02/2023	07:30	Meadow Pipit	1	10	10	0	0	0	heath and scrub; fly/land/calling	EF
BZ1087	VP16	18/02/2023	12:30	Buzzard	1	126	0	0	126	0	heath and scrub; circling, lost behind trees	EF
SN322	VP14	20/02/2023	07:00	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; heard calling, east of VP flew east	SP
-	VP14	20/02/2023	07:35	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying west	SP
-	VP14	20/02/2023	07:42	Redwing	250	15	15	0	0	0	cutover bog and bog woodland; flying se , over VP	SP
-	VP14	20/02/2023	07:54	Redwing	300	15	15	0	0	0	cutover bog and bog woodland; flying east , over trees ne of VP	SP
ML031	VP14	20/02/2023	07:58	Merlin	1	15	15	0	0	0	cutover bog and bog woodland; flying SW, low in front of VP	SP
BZ1088	VP14	20/02/2023	08:05	Buzzard	2	240	0	240	0	0	cutover bog and bog woodland; soaring/circling, se of vp14 moved east	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP14	20/02/2023	08:13	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying	SP
BZ1089	VP14	20/02/2023	08:15	Buzzard	3	480	0	480	0	0	cutover bog and bog woodland; soaring/circling, 2 east 1 se of VP	SP
BZ1090	VP14	20/02/2023	08:26	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; soaring/circling, ne of VP different bird to previous flight	SP
BZ1091	VP14	20/02/2023	08:27	Buzzard	4	900	0	900	0	0	cutover bog and bog woodland; soaring/circling, 3 birds together east of VP 1 bird in the SE	SP
BZ1092	VP14	20/02/2023	08:46	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flying slowly s, dropped into trees se of VP	SP
-	VP14	20/02/2023	08:56	Meadow Pipit	3	20	20	0	0	0	cutover bog and bog woodland; flying se	SP
BZ1093	VP14	20/02/2023	09:30	Buzzard	3	600	0	600	0	0	cutover bog and bog woodland; soaring/circling, moved different directions hunting	SP
-	VP14	20/02/2023	10:26	Meadow Pipit	3	15	15	0	0	0	cutover bog and bog woodland; flying s	SP
K708	VP14	20/02/2023	10:39	Kestrel	1	300	300	0	0	0	cutover bog and bog woodland; male hunting, s-se edge of bog	SP
-	VP14	20/02/2023	10:58	Redwing	25	10	10	0	0	0	cutover bog and bog woodland; flying east, over trees ne of VP	SP
K709	VP14	20/02/2023	11:50	Kestrel	1	20	20	0	0	0	cutover bog and bog woodland; seen briefly hunting, SE of VP	SP
BZ1094	VP14	20/02/2023	11:53	Buzzard	2	1200	0	1200	0	0	cutover bog and bog woodland; soaring/circling, E of VP	SP
K710	VP14	20/02/2023	11:57	Kestrel	1	30	30	0	0	0	cutover bog and bog woodland; hunting, N of VP	SP
BZ1095	VP14	20/02/2023	11:57	Buzzard	1	10	10	0	0	0	cutover bog and bog woodland; over trees, N of VP	SP
K711	VP14	20/02/2023	12:01	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; hunting over bog, from south flew NW	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP14	20/02/2023	12:16	Herring Gull	60	120	0	120	0	0	cutover bog and bog woodland; moving south, outside VP arc	SP
K712	VP14	20/02/2023	12:31	Kestrel	1	600	600	0	0	0	cutover bog and bog woodland; hunting over bog, moved slowly NE	SP
BZ1096	VP14	20/02/2023	12:46	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; flying over trees, E of VP	SP
SN323	VP14	20/02/2023	12:47	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; flying NW, N of VP	SP
BZ1097	VP14	20/02/2023	12:50	Buzzard	1	20	20	0	0	0	cutover bog and bog woodland; over the bog , hunting N-NE of VP	SP
SH223	VP14	20/02/2023	12:56	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; on tree then flew se low over the bog. female, e of VP	SP
BZ1098	VP14	20/02/2023	13:00	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; hunting , N of VP moved east	SP
-	VP5	21/02/2023	06:41	Mallard	3	5	5	0	0	0	cutover bog; travelling	KB
SN324	VP5	21/02/2023	06:45	Snipe	1	3	3	0	0	0	immature woodland and cutover bog; drumming, briefly	KB
-	VP5	21/02/2023	07:01	Teal	7	8	8	0	0	0	cutover bog; travelling	KB
K713	VP5	21/02/2023	07:37	Kestrel	1	60	5	55	0	0	cutover bog; foraging and hovering, dropped down. adult female	KB
K714	VP5	21/02/2023	07:39	Kestrel	1	6	6	0	0	0	cutover bog; foraging, adult female	KB
-	VP5	21/02/2023	07:39	Mallard	2	40	10	10	20	0	cutover bog; travelling, took up, alarm calling	KB
GP335	VP5	21/02/2023	08:20	Golden Plover	12	15	0	0	15	0	cutover bog; flying over	KB
GP336	VP5	21/02/2023	08:24	Golden Plover	12	5	0	0	0	5	cutover bog; flying over	KB
GP337	VP5	21/02/2023	10:38	Golden Plover	31	180	0	0	120	60	cutover bog; flying over	KB
GP338	VP5	21/02/2023	10:46	Golden Plover	17	240	0	0	120	120	cutover bog; flying over	KB
GP339	VP5	21/02/2023	10:50	Golden Plover	17	540	0	0	480	60	cutover bog; flying over	KB
BZ1099	VP10	23/02/2023	08:20	Buzzard	1	20	0	20	0	0	cutover bog and mixed broadleaved/conifer woodland; foraging	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1100	VP10	23/02/2023	11:22	Buzzard	1	180	0	10	170	0	cutover bog and mixed broadleaved/conifer woodland; soaring, emerged from woodland, calling - soaring, flapping and gliding over bog - turned and flew back into trees, calling	KB
BZ1101	VP10	23/02/2023	11:27	Buzzard	3	320	0	10	200	110	cutover bog and mixed broadleaved/conifer woodland; soaring, emerged from trees, calling - flapping and gliding	KB
BZ1102	VP10	23/02/2023	11:27	Buzzard	1	10	0	10	0	0	mixed broadleaved/conifer woodland; perched, 4 buzzard in total	KB
BZ1103	VP10	23/02/2023	11:30	Buzzard	1	270	0	20	210	40	mixed broadleaved/conifer woodland and cutover bog; soaring	KB
BZ1104	VP10	23/02/2023	11:41	Buzzard	2	120	0	5	115	0	mixed broadleaved/conifer woodland and cutover bog; soaring	KB
BZ1105	VP10	23/02/2023	12:04	Buzzard	1	600	0	30	570	0	immature woodland and cutover bog; soaring	KB
SH224	VP10	23/02/2023	12:17	Sparrowhawk	1	120	0	0	60	60	cutover bog; soaring	KB
BZ1106	VP10	23/02/2023	12:45	Buzzard	1	60	0	0	60	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB
SH225	VP10	23/02/2023	12:45	Sparrowhawk	1	60	0	0	60	0	cutover bog; soaring	KB
BZ1107	VP10	23/02/2023	12:45	Buzzard	1	40	0	20	20	0	cutover bog; soaring	KB
SH226	VP10	23/02/2023	13:02	Sparrowhawk	1	40	0	0	0	40	cutover bog and mixed broadleaved/conifer woodland; soaring	KB
BZ1108	VP10	23/02/2023	13:03	Buzzard	1	20	0	2	18	0	mixed broadleaved/conifer woodland; soaring	KB
BZ1109	VP10	23/02/2023	13:15	Buzzard	1	35	0	5	30	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1110	VP10	23/02/2023	13:23	Buzzard	1	13	0	0	5	8	mixed broadleaved/conifer woodland; flying	KB
SN325	VP6	27/02/2023	06:25	Snipe	1	20	0	20	0	0	cutover bog; drumming	KB
GP340	VP6	27/02/2023	07:50	Golden Plover	23	40	0	0	40	0	cutover bog; flying over	KB
GP341	VP6	27/02/2023	07:57	Golden Plover	23	30	0	0	30	0	cutover bog; flying over	KB
SH227	VP6	27/02/2023	08:12	Sparrowhawk	1	25	5	20	0	0	cutover bog and immature woodland; foraging, female	KB
K715	VP6	27/02/2023	11:17	Kestrel	1	180	10	20	150	0	cutover bog; foraging and hovering	KB
BZ1111	VP6	27/02/2023	11:24	Buzzard	1	50	0	0	50	0	cutover bog and immature woodland; soaring	KB
BZ1112	VP6	27/02/2023	11:29	Buzzard	1	120	0	10	110	0	cutover bog and immature woodland; soaring	KB
GP342	VP6	27/02/2023	11:43	Golden Plover	59	90	0	0	0	90	cutover bog; flying over	KB
GP343	VP6	27/02/2023	11:57	Golden Plover	59	300	0	0	120	180	cutover bog; flying over	KB
GP344	VP6	27/02/2023	12:09	Golden Plover	59	180	0	0	60	120	cutover bog; flying over	KB
K716	VP6	27/02/2023	12:10	Kestrel	1	120	0	20	100	0	cutover bog and immature woodland; foraging and hovering	KB
BZ1113	VP6	27/02/2023	12:22	Buzzard	1	60	0	0	0	60	cutover bog and immature woodland; soaring	KB
BZ1114	VP6	27/02/2023	12:31	Buzzard	1	240	0	0	120	120	cutover bog; soaring	KB
-	VP6	27/02/2023	12:39	Mallard	1	8	8	0	0	0	cutover bog; travelling	KB
-	VP7	01/03/2023	08:06	Mallard	2	8	8	0	0	0	cutover bog; travelling	KB
PE118	VP7	01/03/2023	08:16	Peregrine Falcon	1	50	0	0	50	0	cutover bog; flying, adult - foraging	KB
SN326	VP7	01/03/2023	08:28	Snipe	1	6	6	0	0	0	cutover bog; flushed	KB
BZ1115	VP7	01/03/2023	08:29	Buzzard	1	5	5	0	0	0	cutover bog and immature woodland; foraging	KB
-	VP7	01/03/2023	09:13	Grey Heron	1	200	0	0	200	0	cutover bog; travelling	KB
BZ1116	VP7	01/03/2023	11:52	Buzzard	1	12	0	0	12	0	cutover bog and mixed broadleaved/conifer woodland; foraging	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1117	VP15	02/03/2023	12:20	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, E of VP	SP
K717	VP15	02/03/2023	12:26	Kestrel	1	660	660	0	0	0	cutover bog and bog woodland; hunting over bog, male moved NW	SP
GP345	VP15	02/03/2023	12:34	Golden Plover	18	60	60	0	0	0	cutover bog and bog woodland; low over the bog, flew SW	SP
SN327	VP15	02/03/2023	12:37	Snipe	4	30	30	0	0	0	cutover bog and bog woodland; rose off the bog, flew w calling	SP
BZ1118	VP15	02/03/2023	12:40	Buzzard	2	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, ne of VP low over trees	SP
-	VP15	02/03/2023	12:42	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flew w over VP	SP
K718	VP15	02/03/2023	12:52	Kestrel	2	15	15	0	0	0	cutover bog and bog woodland; briefly together, NE of VP	SP
BZ1119	VP15	02/03/2023	13:02	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; hunting over bog, NE of VP	SP
-	VP15	02/03/2023	13:22	Buzzard	2	480	0	480	0	0	cutover bog and bog woodland; soaring/circling	SP
-	VP15	02/03/2023	13:25	Black-headed Gull	60	120	0	120	0	0	cutover bog and bog woodland; soaring/circling, SW of VP moved SW	SP
BZ1120	VP15	02/03/2023	13:40	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, low over trees E of VP	SP
BZ1121	VP15	02/03/2023	14:10	Buzzard	1	120	0	120	0	0	cutover bog and bog woodland; soaring/circling, NE of VP moved E	SP
BZ1122	VP15	02/03/2023	14:17	Buzzard	1	180	180	0	0	0	cutover bog and bog woodland; hunting over bog, SE of VP moved S	SP
-	VP15	02/03/2023	14:25	Red Kite	1	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, moved SW	SP
-	VP15	02/03/2023	14:42	Great Black-backed Gull	2	180	180	0	0	0	cutover bog and bog woodland; slowly flying W	SP
GP346	VP15	02/03/2023	14:46	Golden Plover	80	240	0	0	240	0	cutover bog and bog woodland; circling, flew NE	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP15	02/03/2023	14:56	Cormorant	1	180	0	180	0	0	cutover bog and bog woodland; flying SW	SP
K719	VP15	02/03/2023	15:38	Kestrel	1	120	120	0	0	0	cutover bog and bog woodland; display flight, male moved SW	SP
-	VP15	02/03/2023	15:50	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; hunting over bog, ENE of VP	SP
-	VP15	02/03/2023	16:14	Cormorant	1	180	0	180	0	0	cutover bog and bog woodland; flying SW, same flightline as previous flight	SP
-	VP15	02/03/2023	16:23	Cormorant	2	120	0	120	0	0	cutover bog and bog woodland; flying SW, same flightline as previous flight	SP
-	VP15	02/03/2023	16:27	Grey Heron	1	120	120	0	0	0	cutover bog and bog woodland; flying E, NE of VP	SP
SH228	VP15	02/03/2023	17:02	Sparrowhawk	1	30	30	0	0	0	cutover bog and bog woodland; hunting over bog, E of VP , flew NE	SP
-	VP15	02/03/2023	17:42	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; flew s over VP	SP
SN328	VP15	02/03/2023	18:20	Snipe	2	10	10	0	0	0	cutover bog and bog woodland; flying W calling	SP
BZ1123	VP1	02/03/2023	12:53	Buzzard	3	55	0	0	55	0	cutover bog, improved agricultural grassland and drainage ditches; circling soaring, tree interference	EOB
BZ1124	VP1	02/03/2023	13:45	Buzzard	2	3330	0	1000	2330	0	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; soaring circling	EOB
ML032	VP1	02/03/2023	14:17	Merlin	1	35	30	5	0	0	mixed broadleaved/conifer woodland, cutover bog and conifer plantation; hunting, brief glimpse. male characteristics	EOB
BZ1125	VP1	02/03/2023	18:25	Buzzard	1	40	5	35	0	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting, getting dark	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1126	VP13	03/03/2023	12:16	Buzzard	1	120	0	120	0	0	cutover bog and bog woodland; soaring/circling, E of VP flew se	SP
K720	VP13	03/03/2023	12:40	Kestrel	1	30	30	0	0	0	cutover bog and bog woodland; hunting over bog, E of VP	SP
BZ1127	VP13	03/03/2023	12:49	Buzzard	1	-	-	-	-	-	Perched on tree	SP
BZ1128	VP13	03/03/2023	13:05	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; flying low over trees, SE of VP	SP
ML033	VP13	03/03/2023	13:15	Merlin	1	60	0	60	0	0	cutover bog and bog woodland; hunting, N of VP flew NW	SP
K721	VP13	03/03/2023	13:19	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; hunting over bog, NE of VP	SP
GP347	VP13	03/03/2023	14:24	Golden Plover		120	120	0	0	0	cutover bog and bog woodland; flying low over bog, circled around bog and flew off high to NE	SP
SH229	VP13	03/03/2023	14:39	Sparrowhawk	1	60	60	0	0	0	cutover bog and bog woodland; display flight, s of VP moved SW	SP
BZ1129	VP13	03/03/2023	15:41	Buzzard	3	180	0	180	0	0	cutover bog and bog woodland; over trees, SE of VP 1 bird moved NE	SP
BZ1130	VP13	03/03/2023	16:12	Buzzard	2	30	0	30	0	0	cutover bog and bog woodland; over trees, E of VP	SP
BZ1131	VP13	03/03/2023	17:40	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flying SW, SE of VP over trees	SP
-	VP9	06/03/2023	12:00	Teal	6	13	0	13	0	0	raised bog; travelling	FLM
-	VP2	06/03/2023	13:09	Redwing	122	35	5	30	0	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; flying	EOB
SN329	VP9	06/03/2023	13:30	Snipe	1	9	9	0	0	0	raised bog; travelling then landing in front of VP.	FLM
-	VP9	06/03/2023	15:30	Redwing	8	12	12	0	0	0	raised bog; travelling	FLM
-	VP2	06/03/2023	17:43	Meadow Pipit	3	45	30	15	0	0	cutover bog and drainage ditches; flitting	EOB
BZ1132	VP13	03/03/2023	17:47	Buzzard	1	-	-	-	-	-	Perched on tree	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1133	VP3	07/03/2023	12:43	Buzzard	2	245	0	100	145	0	improved agricultural grassland and cutover bog; soaring circling	EOB
BZ1134	VP3	07/03/2023	12:55	Buzzard	2	2585	0	200	2355	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; soaring circling	EOB
K722	VP3	07/03/2023	13:12	Kestrel	2	1445	400	500	545	0	cutover bog, drainage ditches and immature woodland; hunting, perched three times	EOB
BZ1135	VP10	07/03/2023	14:00	Buzzard	1	63	0	63	0	0	raised bog and oak-birch-holly woodland; circling	FLM
BZ1136	VP3	07/03/2023	14:49	Buzzard	2	425	0	0	425	0	cutover bog, improved agricultural grassland and mixed broadleaved/conifer woodland; soaring, hustled by corvid	EOB
BZ1137	VP10	07/03/2023	15:00	Buzzard	2	45	0	0	45	0	raised bog and oak-birch-holly woodland; circling	FLM
BZ1138	VP10	07/03/2023	16:00	Buzzard	1	70	0	40	30	0	raised bog and mixed broadleaved/conifer woodland; circling	FLM
K723	VP3	07/03/2023	17:16	Kestrel	1	55	10	20	25	0	cutover bog and drainage ditches; hunting hovering	EOB
-	VP3	07/03/2023	17:45	Meadow Pipit	6	35	30	5	0	0	cutover bog and drainage ditches; flitting	EOB
K724	VP6	08/03/2023	12:52	Kestrel	1	45	5	40	0	0	conifer plantation, cutover bog and improved agricultural grassland; hunting	EOB
K725	VP6	08/03/2023	12:53	Kestrel	1	3240	300	1500	1440	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; hunting	EOB
BZ1139	VP6	08/03/2023	12:57	Buzzard	1	2118	100	500	1518	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; hunting soaring	EOB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K726	VP6	08/03/2023	14:48	Kestrel	1	45	10	35	0	0	conifer plantation, cutover bog and drainage ditches; hunting, dived below tree line	EOB
K727	VP6	08/03/2023	14:55	Kestrel	1	1860	200	800	860	0	mixed broadleaved/conifer woodland, cutover bog and drainage ditches; hunting	EOB
BZ1140	VP6	08/03/2023	15:15	Buzzard	1	35	15	20	0	0	conifer plantation and cutover bog; hunting, lost sight in tree line	EOB
K728	VP6	08/03/2023	17:20	Kestrel	1	665	100	200	365	0	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; hunting, male	EOB
-	VP4	13/03/2023	12:51	Meadow Pipit	2	35	35	0	0	0	cutover bog, tall-herb swamps and drainage ditches; flitting	EOB
-	VP4	13/03/2023	14:11	Meadow Pipit	3	55	30	25	0	0	cutover bog, drainage ditches and immature woodland; flitting	EOB
-	VP4	13/03/2023	17:20	Great Black-backed Gull	2	35	0	35	0	0	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; flying	EOB
-	VP4	13/03/2023	17:25	Mallard	2	55	15	40	0	0	cutover bog, drainage ditches and improved agricultural grassland; commuting	EOB
-	VP4	13/03/2023	17:40	Grey Heron	1	60	15	45	0	0	improved agricultural grassland, mixed broadleaved/conifer woodland and cutover bog; flying commuting	EOB
-	VP4	13/03/2023	19:02	Moorhen	1	15	15	0	0	0	drainage ditches and cutover bog; flew and landed	EOB
BZ1141	VP12	14/03/2023	12:31	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; soaring/circling, Robbersbush very briefly	SP
BZ1142	VP12	14/03/2023	12:38	Buzzard	2	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, 1 bird descended other hunted over the bog N of VP	SP
L046	VP12	14/03/2023	12:40	Lapwing	2	30	30	0	0	0	cutover bog and bog woodland; flying over trees, N of VP flew n	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K729	VP12	14/03/2023	13:12	Kestrel	1	10	10	0	0	0	cutover bog and bog woodland; flying sw. W of VP, seen very briefly	SP
GP348	VP12	14/03/2023	13:54	Golden Plover	35	60	0	60	0	0	cutover bog and bog woodland; flying e, over trees N of VP	SP
BZ1143	VP12	14/03/2023	14:16	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; soaring/circling, N of VP flew NW	SP
BZ1144	VP12	14/03/2023	16:04	Buzzard	3	120	0	120	0	0	cutover bog and bog woodland; soaring/circling, NE of VP	SP
K730	VP12	14/03/2023	16:14	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; hunting over bog, NNE of VP moved NW	SP
BZ1145	VP12	14/03/2023	16:20	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; flying NW over trees, NE of VP	SP
K731	VP12	14/03/2023	16:27	Kestrel	1	180	0	180	0	0	cutover bog and bog woodland; male display flight, NE of VP moved ne	SP
BZ1146	VP12	14/03/2023	17:55	Buzzard	1	180	0	180	0	0	cutover bog and bog woodland; flying s-SW over bog	SP
GP349	VP12	14/03/2023	18:20	Golden Plover	9	120	0	120	0	0	cutover bog and bog woodland; circling over bog, landed ne of VP on the bog	SP
WK062	VP12	14/03/2023	18:58	Woodcock	1	30	30	0	0	0	cutover bog and bog woodland; flying e over VP calling	SP
-	VP11	15/03/2023	12:30	Meadow Pipit	8	54	54	0	0	0	raised bog and eroding blanket bog; flying then roosting, continued MP activity through the survey	FLM
K732	VP5	15/03/2023	12:35	Kestrel	1	10	10	0	0	0	cutover bog, drainage ditches and other artificial lakes and ponds; hunting	EOB
K733	VP11	15/03/2023	12:40	Kestrel	1	12	0	12	0	0	raised bog; hovering/ flying, brief passage in front of VP	FLM
SN330	VP11	15/03/2023	13:40	Snipe	5	11	11	0	0	0	raised bog; flying then landing	FLM
-	VP5	15/03/2023	14:15	Meadow Pipit	2	25	20	5	0	0	cutover bog and drainage ditches; flitting	EOB
L047	VP11	15/03/2023	14:30	Lapwing	3	230	0	0	230	0	raised bog; flying over	FLM

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
GP350	VP11	15/03/2023	15:00	Golden Plover	35	55	0	0	55	0	raised bog; flying over	FLM
GP351	VP11	15/03/2023	15:30	Golden Plover	79	612	100	0	512	0	raised bog; flying over then landing for roost	FLM
-	VP5	15/03/2023	16:09	Mallard	1	65	10	5	50	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flying	EOB
-	VP5	15/03/2023	17:12	Redwing	15	65	0	0	65	0	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flying	EOB
SN331	VP5	15/03/2023	18:56	Snipe	2	30	10	20	0	0	cutover bog and drainage ditches; flying calling	EOB
SN332	VP5	15/03/2023	18:58	Snipe	2	15	15	0	0	0	cutover bog and drainage ditches; flying calling	EOB
-	VP5	15/03/2023	19:00	Mallard	4	40	10	30	0	0	cutover bog and drainage ditches; flying	EOB
K734	VP14	20/03/2023	12:46	Kestrel	1	300	300	0	0	0	cutover bog and bog woodland; female hunting, moved se over bog	SP
-	VP14	20/03/2023	12:48	Meadow Pipit	2	10	10	0	0	0	cutover bog and bog woodland; flying s	SP
BZ1147	VP14	20/03/2023	12:56	Buzzard	2	120	0	120	0	0	cutover bog and bog woodland; soaring/circling, NE of VP moved NW	SP
BZ1148	VP14	20/03/2023	13:03	Buzzard	2	180	0	180	0	0	cutover bog and bog woodland; soaring/circling, S of VP moved W	SP
-	VP14	20/03/2023	13:05	Great Black-backed Gull	2	120	0	120	0	0	cutover bog and bog woodland; flying w	SP
-	VP14	20/03/2023	13:08	Great Black-backed Gull	2	10	10	0	0	0	cutover bog and bog woodland; flying ne, low over the bog	SP
K735	VP14	20/03/2023	13:10	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; hunting, moved se	SP
BZ1149	VP16	20/03/2023	13:20	Buzzard	2	221	0	0	221	0	cutover bog; circling/flying	EF
BZ1150	VP14	20/03/2023	13:25	Buzzard	1	120	0	120	0	0	cutover bog and bog woodland; hunting over bog, moved se	SP
BZ1151	VP16	20/03/2023	13:35	Buzzard	41	41	41	0	0	0	cutover bog; direct flight	EF

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP14	20/03/2023	13:37	Meadow Pipit	3	10	10	0	0	0	cutover bog and bog woodland; display flights, ne of VP	SP
BZ1152	VP14	20/03/2023	13:38	Buzzard	2	60	0	60	0	0	cutover bog and bog woodland; pair soaring, NE of VP moved NW	SP
-	VP14	20/03/2023	13:43	Meadow Pipit	1	10	10	0	0	0	cutover bog and bog woodland; display flight, S of VP	SP
K736	VP16	20/03/2023	13:45	Kestrel	2	65	30	35	0	0	cutover bog; direct flight together	EF
-	VP14	20/03/2023	13:48	Great Black-backed Gull	2	180	0	180	0	0	cutover bog and bog woodland; flying s, flew in from ne	SP
-	VP16	20/03/2023	13:50	Meadow Pipit	5	20	20	0	0	0	cutover bog; flying/calling/chasing	EF
BZ1153	VP14	20/03/2023	13:52	Buzzard	1	1680	0	1680	0	0	cutover bog and bog woodland; soaring/circling, joined briefly by 2nd bird at 14:08. ne of VP	SP
K737	VP16	20/03/2023	13:55	Kestrel	1	26	26	0	0	0	cutover bog; direct flight. landed briefly, male	EF
BZ1154	VP16	20/03/2023	14:00	Buzzard	1	175	0	45	130	0	cutover bog; circling/soaring	EF
BZ1155	VP16	20/03/2023	14:05	Buzzard	1	29	29	0	0	0	cutover bog; circling low	EF
BZ1156	VP16	20/03/2023	14:10	Buzzard	1	271	20	15	236	0	cutover bog; direct flight/circling/hovering	EF
BZ1157	VP11	20/03/2023	14:12	Buzzard	1	150	100	30	20	0	cutover bog and immature woodland; foraging and soaring , flying low being mobbed by kestrels. landed	KB
K738	VP11	20/03/2023	14:12	Kestrel	1	25	25	0	0	0	cutover bog and immature woodland; mobbing buzzard	KB
K739	VP11	20/03/2023	14:12	Kestrel	1	20	15	5	0	0	cutover bog and immature woodland; mobbing buzzard, all 3 birds (1x buzzard, 2x kestrel) came out of the woods together, kestrels mobbing buzzard, interacting in flight + brief display flight. one kestrel turned around, the other followed the buzzard mobbing and landed on ground south of VP. buzzard flew	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
											across bog v low, gradually rose and began soaring and flew into forestry	
BZ1159	VP14	20/03/2023	14:15	Buzzard	1	60	60	0	0	0	cutover bog and bog woodland; hunting low over trees, SE of VP moved e	SP
K740	VP11	20/03/2023	14:21	Kestrel	1	40	20	20	0	0	cutover bog; foraging, took up, foraging	KB
BZ1160	VP14	20/03/2023	14:23	Buzzard	1	30	30	0	0	0	cutover bog and bog woodland; flying se low, E of VP	SP
BZ1161	VP16	20/03/2023	14:30	Buzzard	2	173	0	30	143	0	cutover bog; circling/soaring/descended	EF
BZ1162	VP16	20/03/2023	14:40	Buzzard	1	80	0	0	80	0	cutover bog; flying/circling	EF
BZ1163	VP16	20/03/2023	14:45	Buzzard	1	26	26	0	0	0	cutover bog; being mobbed by raven	EF
-	VP16	20/03/2023	14:45	Redwing	30	50	0	50	0	0	cutover bog; flying	EF
BZ1164	VP16	20/03/2023	14:55	Buzzard	1	158	0	30	128	0	cutover bog; circling	EF
-	VP16	20/03/2023	15:25	Cormorant	1	52	0	0	52	0	cutover bog; flying	EF
SN333	VP14	20/03/2023	15:44	Snipe	1	30	0	30	0	0	cutover bog and bog woodland; flying SW	SP
PE119	VP11	20/03/2023	15:45	Peregrine Falcon	1	25	0	0	25	0	cutover bog; flying, adult	KB
-	VP16	20/03/2023	15:50	Lesser Black-backed Gull	3	117	0	0	117	0	cutover bog; flying	EF
K741	VP16	20/03/2023	16:05	Kestrel	1	10	10	0	0	0	cutover bog; fly/land	EF
K742	VP16	20/03/2023	16:15	Kestrel	1	5	5	0	0	0	cutover bog; flew from tree and landed again	EF
BZ1165	VP14	20/03/2023	16:34	Buzzard	1	15	15	0	0	0	cutover bog and bog woodland; low over the bog, E of VP flew NW	SP
-	VP14	20/03/2023	16:40	Cormorant	1	120	0	120	0	0	cutover bog and bog woodland; flying SW	SP
-	VP14	20/03/2023	16:51	Great Black-backed Gull	4	60	60	0	0	0	cutover bog and bog woodland; E of VP, flew ne	SP
-	VP14	20/03/2023	16:52	Black-headed Gull	25	60	0	60	0	0	cutover bog and bog woodland; E of VP, flew se	SP

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
K743	VP14	20/03/2023	16:58	Kestrel	1	60	60	0	0	0	cutover bog and bog woodland; low over the bog, E of VP moved SW into trees	SP
GP352	VP14	20/03/2023	17:14	Golden Plover	10	20	0	20	0	0	cutover bog and bog woodland; flying se, SW of VP	SP
-	VP14	20/03/2023	17:17	Great Black-backed Gull	2	60	60	0	0	0	cutover bog and bog woodland; low over the bog, E of VP flying ne	SP
BZ1166	VP11	20/03/2023	17:30	Buzzard	1	60	0	30	30	0	conifer plantation; soaring	KB
K744	VP14	20/03/2023	17:41	Kestrel	1	10	10	0	0	0	cutover bog and bog woodland; male flying into trees, SE of VP	SP
BZ1167	VP11	20/03/2023	18:17	Buzzard	1	15	15	0	0	0	immature woodland and cutover bog; flying	KB
BZ1168	VP16	20/03/2023	18:20	Buzzard	1	32	0	32	0	0	cutover bog; flying, mobbed by crows	EF
WK063	VP16	20/03/2023	19:00	Woodcock	1	25	25	0	0	0	cutover bog; Roding	EF
WK064	VP14	20/03/2023	19:03	Woodcock	3	15	15	0	0	0	cutover bog and bog woodland; flying se over VP, calling	SP
WK065	VP16	20/03/2023	19:10	Woodcock	2	20	20	0	0	0	cutover bog; flying together calling	EF
SN334	VP14	20/03/2023	19:10	Snipe	5	10	10	0	0	0	cutover bog and bog woodland; flying w, calling	SP
WK066	VP16	20/03/2023	19:15	Woodcock	1	6	6	0	0	0	cutover bog; flying/calling	EF
-	VP9	20/03/2023	17:40	Mallard	1	18	18	0	0	0	raised bog; flying then land	FLM
-	VP9	20/03/2023	18:00	Redwing	32	25	0	5	20	0	raised bog; flying to roost	FLM
-	VP7	21/03/2023	15:11	Mallard	1	15	2	13	0	0	cutover bog and immature woodland; travelling	KB
-	VP7	21/03/2023	15:16	Mallard	1	17	0	17	0	0	cutover bog and immature woodland; travelling	KB
-	VP7	21/03/2023	17:27	Mallard	1	8	8	0	0	0	cutover bog; travelling	KB
-	VP10	21/03/2023	17:00	Meadow Pipit	1	1	1	0	0	0	raised bog and eroding blanket bog; roosting	FLM
BZ1169	VP10	21/03/2023	17:30	Buzzard	1	86	32	54	0	0	raised bog and mixed broadleaved/conifer woodland; flying, hovering against wind at tree height	FLM

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
-	VP8	22/03/2023	16:56	Mallard	2	6	6	0	0	0	cutover bog; travelling	KB
-	VP8	22/03/2023	16:56	Mallard	1	5	5	0	0	0	cutover bog; travelling	KB
SN335	VP8	22/03/2023	19:16	Snipe	1	5	5	0	0	0	cutover bog; travelling	KB
SN336	VP8	22/03/2023	19:17	Snipe	1	8	8	0	0	0	cutover bog; travelling	KB
SN337	VP8	22/03/2023	19:22	Snipe	1	25	0	25	0	0	cutover bog; drumming	KB
-	VP8	22/03/2023	19:24	Mallard	1	12	0	12	0	0	cutover bog; travelling	KB
SN338	VP8	22/03/2023	19:25	Snipe	1	1140	0	240	900	0	cutover bog; drumming	KB
SN339	VP8	22/03/2023	19:26	Snipe	1	8	8	0	0	0	cutover bog; travelling	KB
SN340	VP8	22/03/2023	19:29	Snipe	1	7	7	0	0	0	cutover bog; travelling	KB
SN341	VP8	22/03/2023	19:36	Snipe	1	5	5	0	0	0	cutover bog; travelling	KB
BZ1170	VP10	24/03/2023	05:48	Buzzard	1	40	20	20	0	0	cutover bog and mixed broadleaved/conifer woodland; soaring, took up from ground, soaring, flew into woodland	KB
BZ1171	VP10	24/03/2023	08:02	Buzzard	1	120	20	100	0	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB
BZ1172	VP10	24/03/2023	08:09	Buzzard	2	180	60	120	0	0	cutover bog and mixed broadleaved/conifer woodland; soaring, soaring, perched briefly in trees, took up soaring again and flew into woodland	KB
GP353	VP10	24/03/2023	09:11	Golden Plover	23	20	0	0	20	0	cutover bog; flying over	KB
GP354	VP10	24/03/2023	09:20	Golden Plover	36	60	0	0	60	0	cutover bog; flying over	KB
GP355	VP10	24/03/2023	09:53	Golden Plover	36	10	0	0	0	10	cutover bog; flying over	KB
BZ1173	VP10	24/03/2023	10:28	Buzzard	2	300	0	60	240	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB
BZ1174	VP10	24/03/2023	10:31	Buzzard	2	30	0	10	20	0	mixed broadleaved/conifer woodland; soaring	KB

Map Ref.	VP	Date	Time	Species	Number	Duration of flight (s)	Band 1 (0-15m)	Band 2 (15-25m)	Band 3 (25-200m)	Band 4 (>200m)	Habitat and activity	Surveyor
BZ1175	VP10	24/03/2023	10:35	Buzzard	3	360	0	0	360	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB
BZ1176	VP10	24/03/2023	10:44	Buzzard	1	120	0	30	90	0	cutover bog and mixed broadleaved/conifer woodland; soaring	KB

Appendix 1 Table 3 Vantage Point Survey Non Flight Observations

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
BZ1177	VP7	06/10/2022	10:24	Buzzard	1	cutover bog and bog woodland; heard calling, west of vp7	SP
GP356	VP12	06/10/2022	10:27	Golden Plover	100	cutover bog; on ground (peat)	MW
-	VP13	11/10/2022	06:40	Snipe	1	cutover bog; flight , heard not seen	MW
-	VP13	11/10/2022	06:42	Mallard	2	cutover bog; unknown, heard not seen from vp13	MW
SN342	VP13	11/10/2022	11:29	Snipe	1	cutover bog; flushed but not seen	MW
BZ1178	VP10	14/10/2022	07:18	Buzzard	1	mixed broadleaved/conifer woodland; calling	KS
SN343	VP14	14/10/2022	08:17	Snipe	1	cutover bog; flushed flight	MW
SN344	VP14	14/10/2022	08:18	Snipe	1	cutover bog; flushed flight	MW
SN345	VP14	14/10/2022	08:19	Snipe	1	cutover bog; flushed flight	MW
BZ1179	VP14	14/10/2022	08:20	Buzzard	1	conifer plantation; heard not seen, guess of habitat	MW
BZ1180	VP10	14/10/2022	08:43	Buzzard	1	mixed broadleaved/conifer woodland; calling	KS
BZ1181	VP14	14/10/2022	10:51	Buzzard	1	cutover bog; heard not seen	MW
-	VP14	14/10/2022	12:19	Meadow Pipit	2	scrub and cutover bog; perched	MW
-	VP9	03/11/2022	07:28	Water Rail	1	cutover bog and bog woodland; heard calling, n of vp9	SP
-	VP9	03/11/2022	07:38	Mallard	1	cutover bog and bog woodland; heard calling, n of vp9	SP
-	VP12	03/11/2022	12:45	Meadow Pipit	2	scrub; perched on scrub stands	MW
-	VP12	03/11/2022	12:47	Meadow Pipit	1	cutover bog; heard not seen	MW
-	VP14	07/11/2022	13:42	Meadow Pipit	3	cutover bog; brief flights to/from points	MW
-	VP1	08/11/2022	12:00	Redwing	10	cutover bog and bog woodland; flying s into trees sw of vp 16:16	SP
SN346	VP13	08/11/2022	11:25	Snipe	1	cutover bog; heard not seen	MW
-	VP13	08/11/2022	15:03	Meadow Pipit	3	cutover bog; flight in vicinity of point	MW
K745	VP13	08/11/2022	15:39	Kestrel	1	cutover bog; perched on conifer	MW
SN347	VP13	08/11/2022	17:10	Snipe	4	cutover bog; heard not seen, estimated number based on calls at dusk	MW

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
-	VP11	15/11/2022	15:31	Meadow Pipit	2	cutover bog; flights around point	MW
-	VP11	15/11/2022	15:32	Meadow Pipit	1	cutover bog; flights around point	MW
SN348	VP11	15/11/2022	17:26	Snipe	3	cutover bog; flushed, heard not seen	MW
-	VP9	18/11/2022	19:32	Teal	2	cutover bog; heard not seen	MW
K746	VP10	21/11/2022	14:53	Kestrel	1	mixed broadleaved woodland; perched in conifer	MW
-	VP10	23/11/2022	06:50	Stock Dove	2	cutover bog and bog woodland; flying w	SP
BZ1182	VP3	30/11/2022	13:02	Buzzard	1	scrub; perched in scrub	MW
K747	VP3	30/11/2022	15:29	Kestrel	1	cutover bog; perched in young conifer	MW
SN349	VP3	30/11/2022	16:56	Snipe	10	cutover bog; flights, estimate, heard not seen	MW
-	VP5	06/01/2023	08:07	Water Rail	1	cutover bog, bog woodland and drainage ditches; calling SW of vp4, very close to vp5	SP
-	VP5	06/01/2023	09:48	Water Rail	2	cutover bog, bog woodland and drainage ditches; 2 calling s of vp5, calling periodically for 2 minutes	SP
-	VP5	06/01/2023	12:36	Water Rail	1	cutover bog, bog woodland and drainage ditches; calling SW of vp5	SP
-	VP15	11/01/2023	11:14	Meadow Pipit	2	cutover bog; flying over	KB
-	VP2	16/01/2023	12:14	Yellowhammer	2	mixed broadleaved/conifer woodland and cutover bog; perched in tree	EOB
BZ1184	VP2	16/01/2023	13:06	Buzzard	1	mixed broadleaved/conifer woodland, cutover bog and improved agricultural grassland; perched in tree	EOB
BZ1185	VP2	16/01/2023	15:52	Buzzard	1	mixed broadleaved/conifer woodland and cutover bog; perched in tree, 19 minutes	EOB
BZ1186	VP2	16/01/2023	16:20	Buzzard	1	cutover bog and mixed broadleaved/conifer woodland; perched on tree, 10 minutes	EOB
SN350	VP2	16/01/2023	17:15	Snipe	1	cutover bog and buildings and artificial surfaces; calling, heard	EOB
GP357	VP3	17/01/2023	12:04	Golden Plover	1	cutover bog; calling, heard not seen	EOB
-	VP3	17/01/2023	13:31	Meadow Pipit	1	cutover bog and mixed broadleaved/conifer woodland; flitting, alarm call	EOB
K748	VP3	17/01/2023	15:25	Kestrel	1	mixed broadleaved/conifer woodland and cutover bog; perched in tree with prey, male	EOB

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
K749	VP3	17/01/2023	15:30	Kestrel	1	mixed broadleaved/conifer woodland and cutover bog; perched in tree, same male	EOB
K750	VP3	17/01/2023	16:52	Kestrel	1	cutover bog and mixed broadleaved/conifer woodland; perched on top conifer, 16 minutes, female	EOB
-	VP4	20/01/2023	11:21	Meadow Pipit	2	cutover bog and mixed broadleaved/conifer woodland; flitting, heard	EOB
SN351	VP4	20/01/2023	17:00	Snipe	1	cutover bog; calling, heard	EOB
GP358	VP5	23/01/2023	11:12	Golden Plover	1	cutover bog and mixed broadleaved/conifer woodland; calling, heard	EOB
-	VP5	23/01/2023	13:30	Meadow Pipit	2	mixed broadleaved/conifer woodland and cutover bog; perched in tree, juveniles	EOB
-	VP5	23/01/2023	17:11	Water Rail	2	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; calling, heard	EOB
-	VP1	26/01/2023	13:26	Meadow Pipit	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; calling, heard	EOB
PE020	VP6	26/01/2023	12:50	Peregrine Falcon	1	bogs and eroding blanket bog; perched/ grooming	FLM
PE021	VP6	26/01/2023	12:49	Peregrine Falcon	1	bogs and eroding blanket bog; perched	FLM
-	VP2	07/02/2023	08:20	Meadow Pipit	1	cutover bog, buildings and artificial surfaces and mixed broadleaved/conifer woodland; calling, heard	EOB
-	VP2	07/02/2023	08:44	Meadow Pipit	6	buildings and artificial surfaces, cutover bog and mixed broadleaved/conifer woodland; perched on ESB cables, juveniles present	EOB
-	VP3	08/02/2023	07:10	Mallard	2	cutover bog and drainage ditches; calling	EOB
BZ1187	VP12	09/02/2023	11:28	Buzzard	1	cutover bog and bog woodland; perched on tree, 15 minutes preening	SP
BZ1188	VP9	15/02/2023	11:49	Buzzard	1	immature woodland and cutover bog; calling	KB
SN352	VP4	15/02/2023	07:02	Snipe	1	cutover bog and mixed broadleaved/conifer woodland; calling	EOB
-	VP4	15/02/2023	07:08	Water Rail	1	drainage ditches, cutover bog and mixed broadleaved/conifer woodland; calling	EOB

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
-	VP4	15/02/2023	07:10	Mallard	2	drainage ditches, cutover bog and spoil and bare ground; calling	EOB
-	VP4	15/02/2023	07:22	Water Rail	1	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; calling	EOB
-	VP4	15/02/2023	07:27	Mallard	1	cutover bog and mixed broadleaved/conifer woodland; calling	EOB
-	VP4	15/02/2023	08:55	Meadow Pipit	4	mixed broadleaved/conifer woodland and cutover bog; perched on beech trees	EOB
-	VP8	17/02/2023	09:14	Meadow Pipit	2	cutover bog; flying	KB
-	VP5	21/02/2023	07:10	Moorhen	1	drainage ditches and cutover bog; calling	KB
-	VP5	21/02/2023	07:13	Meadow Pipit	2	cutover bog; flying	KB
SN353	VP5	21/02/2023	07:56	Snipe	1	cutover bog; chipping	KB
-	VP10	23/02/2023	07:54	Meadow Pipit	2	cutover bog; flying over	KB
SN354	VP6	27/02/2023	06:20	Snipe	1	cutover bog; chipping	KB
SN355	VP6	27/02/2023	06:36	Snipe	1	cutover bog; chipping	KB
-	VP6	27/02/2023	07:16	Mallard	2	cutover bog; calling	KB
ML034	VP1	02/03/2023	17:23	Merlin	1	mixed broadleaved/conifer woodland, cutover bog and improved agricultural grassland; perched on top of tree, male	EOB
BZ1189	VP13	03/03/2023	12:49	Buzzard	1	cutover bog and bog woodland; perched on tree, 13:47 flew n into trees	SP
ML035	VP13	03/03/2023	13:40	Merlin	1	cutover bog and bog woodland; male perched on ground for most of the day, 17:20 flew n hunting	SP
BZ1190	VP13	03/03/2023	17:47	Buzzard	1	cutover bog and bog woodland; perched on tree, 18:20 dropped into forestry SE of VP	SP
-	VP2	06/03/2023	17:13	Meadow Pipit	1	cutover bog and drainage ditches; calling, heard	EOB
BZ1191	VP2	06/03/2023	17:36	Buzzard	1	cutover bog, mixed broadleaved/conifer woodland and improved agricultural grassland; calling, heard briefly	EOB
BZ1192	VP2	06/03/2023	18:19	Buzzard	1	mixed broadleaved/conifer woodland, cutover bog and improved agricultural grassland; perched on top of tree	EOB

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
SN356	VP2	06/03/2023	18:44	Snipe	1	cutover bog and drainage ditches; calling, heard	EOB
K751	VP3	07/03/2023	12:44	Kestrel	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; perched on pine tree, male	EOB
K752	VP3	07/03/2023	12:54	Kestrel	1	mixed broadleaved/conifer woodland, cutover bog and drainage ditches; perched, same k.	EOB
SN357	VP3	07/03/2023	18:17	Snipe	1	cutover bog and drainage ditches; calling, heard	EOB
SN358	VP3	07/03/2023	18:17	Snipe	1	cutover bog and drainage ditches; calling, heard	EOB
SN359	VP3	07/03/2023	18:53	Snipe	2	cutover bog and drainage ditches; calling, heard	EOB
-	VP6	08/03/2023	18:11	Water Rail	1	cutover bog and drainage ditches; calling, heard	EOB
SN360	VP6	08/03/2023	18:58	Snipe	1	cutover bog, drainage ditches and highly modified/non-native woodland; flushed flew	EOB
-	VP4	13/03/2023	17:36	Coot	1	drainage ditches and cutover bog; calling, heard	EOB
SN361	VP4	13/03/2023	19:06	Snipe	2	cutover bog and drainage ditches; calling flying	EOB
SN362	VP4	13/03/2023	19:07	Snipe	1	cutover bog and drainage ditches; calling	EOB
SN363	VP4	13/03/2023	19:10	Snipe	1	cutover bog and drainage ditches; calling	EOB
GP359	VP12	14/03/2023	12:30	Golden Plover	1	cutover bog and bog woodland; roosting on the bog, eventually flew off east at 15:30	SP
-	VP12	14/03/2023	13:20	Merlin	1	cutover bog and bog woodland; female perched on ground, flew sw at 14:30	SP
BZ1193	VP12	14/03/2023	14:19	Buzzard	1	cutover bog and bog woodland; perched on pylon, 14:21 dropped into trees heavy rain	SP
-	VP12	14/03/2023	17:35	Sparrowhawk	1	cutover bog and bog woodland; perched on pylon, 2 minutes dropped into trees e of VP	SP
-	VP5	15/03/2023	13:20	Moorhen	1	drainage ditches, cutover bog and other artificial lakes and ponds; calling, heard	EOB
-	VP5	15/03/2023	13:35	Moorhen	1	drainage ditches and cutover bog; calling, heard	EOB
-	VP5	15/03/2023	16:08	Moorhen	1	drainage ditches, other artificial lakes and ponds and cutover bog; calling, flooded pb4	EOB
-	VP5	15/03/2023	18:22	Water Rail	2	cutover bog and drainage ditches; calling	EOB
SN364	VP5	15/03/2023	18:47	Snipe	1	cutover bog and drainage ditches; calling	EOB

Map Ref.	VP	Date	Time	Species	Number	Habitat and activity	Surveyor
SN365	VP5	15/03/2023	18:55	Snipe	1	cutover bog and drainage ditches; calling flying	EOB
-	VP11	20/03/2023	13:10	Meadow Pipit	3	bogs; foraging	KB
-	VP7	21/03/2023	15:47	Redwing	36	cutover bog; flying over	KB
SN366	VP8	22/03/2023	19:20	Snipe	1	cutover bog; chipping	KB
SN367	VP8	22/03/2023	19:21	Snipe	1	cutover bog; chipping	KB
SN368	VP8	22/03/2023	19:30	Snipe	1	cutover bog; chipping	KB

Appendix 1 Table 4 Winter Walkover Survey Observations

Map Ref.	Date	Time	Species	Number	Habitat and activity	Surveyor
-	10/10/2022	11:52	Meadow Pipit	1	cutover bog; display flight,	NM
-	10/10/2022	12:04	Meadow Pipit	1	cutover bog; display flight,	NM
GP005	10/10/2022	12:13	Golden Plover	14	cutover bog; at rest,	NM
SN104	10/10/2022	12:26	Snipe	1	cutover bog; flushed flight,	NM
-	10/10/2022	14:18	Meadow Pipit	2	cutover bog and conifer plantation; travelling,	NM
-	10/10/2022	14:26	Meadow Pipit	1	cutover bog; travelling,	NM
GP006	11/10/2022	12:20	Golden Plover	8	cutover bog and conifer plantation; travelling,	NM
-	11/10/2022	12:25	Mallard	1	cutover bog and conifer plantation; travelling,	NM
-	11/10/2022	12:49	Meadow Pipit	1	bogs; flushed flight,	NM
-	11/10/2022	12:52	Meadow Pipit	1	cutover bog; travelling,	NM
-	11/10/2022	13:03	Meadow Pipit	1	cutover bog; travelling,	NM
-	11/10/2022	13:34	Meadow Pipit	1	cutover bog and conifer plantation; travelling,	NM
SN105	11/10/2022	13:37	Snipe	1	cutover bog; flushed flight,	NM
SN106	11/10/2022	13:37	Snipe	1	cutover bog; flushed flight,	NM
-	11/10/2022	14:02	Meadow Pipit	1	cutover bog; flushed flight,	NM
-	11/10/2022	14:08	Meadow Pipit	1	cutover bog; flushed flight,	NM
-	11/10/2022	15:02	Meadow Pipit	3	cutover bog; travelling,	NM
ML003	11/10/2022	15:12	Merlin	1	cutover bog; travelling,	NM
-	11/10/2022	16:13	Meadow Pipit	2	cutover bog; display flight,	NM
WK001	16/02/2023	09:35	Woodcock	1	cutover bog; flushed,	KB
BZ037	16/02/2023	10:02	Buzzard	1	immature woodland and cutover bog; perched - took up, foraging,	KB
SN107	16/02/2023	11:04	Snipe	3	cutover bog; flushed,	KB
BZ038	16/02/2023	12:41	Buzzard	2	cutover bog; soaring,	KB
-	16/02/2023	12:49	Meadow Pipit	1	cutover bog; flying over,	KB
SN108	16/02/2023	12:51	Snipe	1	cutover bog; flushed,	KB

Map Ref.	Date	Time	Species	Number	Habitat and activity	Surveyor
GP007	16/02/2023	12:51	Golden Plover		cutover bog; heard calling over head,	KB
SN109	16/02/2023	12:57	Snipe	1	cutover bog; flushed,	KB
GP008	16/02/2023	13:13	Golden Plover	8	cutover bog; flying , flying low around bog, landed	KB
SN110	16/02/2023	13:27	Snipe	2	cutover bog; flushed,	KB
-	16/02/2023	13:27	Mallard	2	cutover bog; flushed,	KB
GP009	16/02/2023	13:30	Golden Plover	113	cutover bog; flying over,	KB
-	23/02/2023	14:25	Meadow Pipit	1	cutover bog; on ground,	KB
PE003	23/02/2023	14:46	Peregrine Falcon	1	cutover bog; flying - on ground, adult - flying low around bog, landed on ground	KB
SN111	23/02/2023	14:58	Snipe	1	cutover bog; flushed,	KB
SN112	23/02/2023	15:03	Snipe	1	cutover bog; flushed,	KB
SN113	23/02/2023	15:10	Snipe	2	cutover bog; flushed,	KB
GP010	23/02/2023	15:25	Golden Plover	42	cutover bog; flying over,	KB
BZ039	27/02/2023	13:25	Buzzard	1	cutover bog and immature woodland; soaring,	KB
BZ040	27/02/2023	13:34	Buzzard	1	conifer plantation and cutover bog; soaring,	KB
-	23/03/2023	08:49	Meadow Pipit	2	cutover bog; foraging,	KS
SN114	23/03/2023	09:16	Snipe	1	cutover bog; flushed,	KS
SN115	23/03/2023	09:20	Snipe	22	cutover bog; flushed,	KS
-	23/03/2023	09:24	Lesser Black-backed Gull	1	cutover bog; travelling,	KS
-	23/03/2023	09:25	Teal	2	cutover bog; flushed,	KS
-	23/03/2023	09:30	Lesser Black-backed Gull	1	cutover bog; foraging, at water edge	KS
PE004	23/03/2023	09:39	Peregrine Falcon	1	cutover bog; hunting,	KS
BZ041	23/03/2023	10:11	Buzzard	1	cutover bog and treelines; calling, mewing call	KS
-	24/03/2023	09:23	Mallard	2	cutover bog; flushed,	KS
SN116	24/03/2023	09:36	Snipe	2	cutover bog; flushed,	KS

Map Ref.	Date	Time	Species	Number	Habitat and activity	Surveyor
HH001	24/03/2023	09:42	Hen Harrier	1	cutover bog and scrub; quartering, ringtail, could be bird on passage to breeding territory	KS
-	24/03/2023	09:50	Teal	2	cutover bog; flushed,	KS
GP011	24/03/2023	09:54	Golden Plover	4	cutover bog; travelling,	KS
-	24/03/2023	11:10	Meadow Pipit	2	cutover bog; foraging,	KS
SN117	24/03/2023	11:29	Snipe	1	cutover bog; flushed,	KS
-	28/03/2023	11:30	Mallard	2	raised bog, eroding blanket bog and other artificial lakes and ponds; flushed from drain,	FLM
-	28/03/2023	11:50	Meadow Pipit	4	raised bog; flying/ parachute displays,	FLM
K010	28/03/2023	12:30	Kestrel	1	raised bog and eroding blanket bog; hunting,	FLM
L.001	28/03/2023	13:00	Lapwing	4	raised bog and improved agricultural grassland; displaying/ courtship,	FLM
-	28/03/2023	13:00	Meadow Pipit	6	raised bog; flying over/ parachute display,	FLM
BZ042	28/03/2023	13:00	Buzzard	1	raised bog; hunting,	FLM
SN118	28/03/2023	13:45	Snipe	2	raised bog; flushed, foraging in flooded area	FLM
BZ043	28/03/2023	15:00	Buzzard	1	eroding blanket bog and mixed broadleaved/conifer woodland; flying over,	FLM
SN119	29/03/2023	12:00	Snipe	4	raised bog; flushed,	FLM
-	29/03/2023	12:20	Meadow Pipit	4	raised bog; flying/ parachute display/ singing,	FLM
PE005	29/03/2023	13:00	Peregrine Falcon	1	raised bog and eroding blanket bog; hunting/ flying/ perched,	FLM
BZ044	29/03/2023	13:00	Buzzard	1	raised bog and conifer plantation; flying over,	FLM
GP012	29/03/2023	14:00	Golden Plover	65	eroding blanket bog; roosting,	FLM
-	29/03/2023	16:00	Teal	2	raised bog and eroding blanket bog; flushed,	FLM

Appendix 1 Table 5 Waterbird Distribution and Abundance Survey Observations

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	River Deel	11/10/2022	10:17	Mute Swan	4	eroding/upland rivers; on water, 2 adults, 2 immature	KS
-	Derrymore Springs	11/10/2022	10:48	Mute Swan	2	dystrophic lakes; on water	KS
-	Derrymore Springs	11/10/2022	10:48	Little Grebe	2	dystrophic lakes; diving	KS
WS047	Rive Deel 2 N	27/10/2022	09:00	Whooper Swan	3	arable crops; foraging	KS
WS048	River Deel	27/10/2022	09:10	Whooper Swan	3	arable crops; foraging, possibly same birds	KS
-	Shay Murtagh Lakes	27/10/2022	09:50	Coot	1	active quarries and mines; on water	KS
-	Derrymore Springs	27/10/2022	10:11	Mute Swan	1	lakes and ponds; on water	KS
-	Derrymore Springs	27/10/2022	10:11	Little Grebe	1	lakes and ponds; diving, moorhen also	KS
SN014	Billistown	27/10/2022	12:41	Snipe	1	wet grassland; flushed	KS
WS049	Annalla fields	27/10/2022	12:46	Whooper Swan	2	improved agricultural grassland; foraging	KS
-	River Boyne	16/11/2022	09:24	Mallard	1	dystrophic lakes; on water	KS
-	Derrymore Springs	16/11/2022	11:16	Little Grebe	2	springs; diving	KS
-	Reynella Lakes	16/11/2022	12:05	Mallard	3	dystrophic lakes; calling	KS
-	Johnstown Lakes	16/11/2022	12:05	Mallard	6	dystrophic lakes; on water	KS
WS050	Annalla fields	16/11/2022	13:18	Whooper Swan	12	improved agricultural grassland; foraging	KS
-	River Boyne	01/12/2022	10:25	Mute Swan	4	eroding/upland rivers; on water, 2 adult, 2 juvenile	KS
ET006	River Boyne	01/12/2022	10:25	Little Egret	1	eroding/upland rivers; feeding	KS
-	Shay Murtagh Lakes	01/12/2022	11:14	Curlew	6	dystrophic lakes; travelling n	KS
-	Shay Murtagh Lakes	01/12/2022	11:21	Tufted Duck	11	dystrophic lakes; on water, ma32 lg1	KS
KF016	Reynella Lakes	01/12/2022	12:41	Kingfisher	1	dystrophic lakes and scrub; calling	KS
-	Reynella Lakes	01/12/2022	12:43	Mallard	5	dystrophic lakes; flushed	KS
L021	Reynella Lakes	01/12/2022	12:48	Lapwing	1	improved agricultural grassland and dystrophic lakes; travelling w	KS
WS051	Annalla fields	01/12/2022	13:20	Whooper Swan	16	improved agricultural grassland; foraging	KS
WS052	Annalla lakes	01/12/2022	14:24	Whooper Swan	9	dystrophic lakes; on water, 4 juveniles	KS
-	Annalla lakes	01/12/2022	14:24	Cormorant	7	dystrophic lakes; flushed	KS
-	Annalla lakes	01/12/2022	14:24	Green Sandpiper	2	dystrophic lakes; landing, flew across lake into reeds	KS

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Derrymore Springs	07/12/2022	09:15	Moorhen	3	lakes and ponds; feeding	DM
-	Derrymore Springs	07/12/2022	09:15	Little Grebe	4	lakes and ponds; feeding	DM
-	Derrymore Springs	07/12/2022	09:15	Mallard	3	lakes and ponds; feeding	DM
-	Derrymore Springs	07/12/2022	09:15	Grey Heron	1	lakes and ponds; feeding	DM
-	Derrymore Springs	07/12/2022	09:15	Cormorant	3	lakes and ponds; travelling	DM
-	River Deel	07/12/2022	10:00	Lesser Black-backed Gull	1	depositing/lowland rivers and improved agricultural grassland; travelling	DM
-	River Deel	07/12/2022	10:30	Little Grebe	2	depositing/lowland rivers; feeding	DM
L022	River Deel	07/12/2022	10:30	Lapwing	2	depositing/lowland rivers and improved agricultural grassland; travelling	DM
ET007	River Deel	07/12/2022	10:30	Little Egret	1	depositing/lowland rivers; travelling	DM
WS053	N. of Ballivor	07/12/2022	11:30	Whooper Swan	4	arable crops; feeding	DM
GP008	N. of Ballivor	07/12/2022	11:30	Golden Plover	135	arable crops and improved agricultural grassland; travelling	DM
-	Crowinstown lake	07/12/2022	12:30	Grey Heron	1	lakes and ponds; feeding	DM
-	Crowinstown lake	07/12/2022	12:30	Teal	5	lakes and ponds; feeding	DM
WS054	Annalla fields	07/12/2022	13:00	Whooper Swan	25	improved agricultural grassland; feeding	DM
-	Annalla fields	07/12/2022	13:00	Mute Swan	11	improved agricultural grassland; feeding	DM
-	Johnstown Lakes	07/12/2022	13:30	Cormorant	1	lakes and ponds; feeding	DM
-	Johnstown Lakes	07/12/2022	13:30	Grey Heron	1	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Moorhen	9	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Cormorant	3	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Wigeon	1	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Mallard	11	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Little Grebe	3	lakes and ponds; feeding	DM
-	Annalla lakes	07/12/2022	14:30	Great Crested Grebe	1	lakes and ponds; feeding	DM
SN015	Annalla lakes	07/12/2022	14:30	Snipe	3	lakes and ponds; roosting	DM
-	Annalla lakes	07/12/2022	14:30	Green Sandpiper	2	lakes and ponds; roosting	DM

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Annalla lakes	07/12/2022	14:30	Grey Heron	1	lakes and ponds; feeding	DM
-	Reynella Lakes	07/12/2022	15:30	Wigeon	40	lakes and ponds; feeding	DM
-	Reynella Lakes	07/12/2022	15:30	Teal	35	lakes and ponds; feeding	DM
-	Reynella Lakes	07/12/2022	15:30	Grey Heron	2	lakes and ponds; feeding	DM
WS055	Riverstown river	29/12/2022	08:45	Whooper Swan	14	improved agricultural grassland; feeding	DM
-	Derrymore Springs	29/12/2022	09:00	Mute Swan	3	lakes and ponds; feeding	DM
-	Derrymore Springs	29/12/2022	09:00	Little Grebe	5	lakes and ponds; feeding	DM
-	Derrymore Springs	29/12/2022	09:00	Mallard	2	lakes and ponds; feeding	DM
-	Derrymore Springs	29/12/2022	09:00	Moorhen	1	lakes and ponds; feeding	DM
-	Derrymore Springs	29/12/2022	09:00	Grey Heron	1	lakes and ponds; feeding	DM
WS056	River Deel	29/12/2022	09:30	Whooper Swan	62	arable crops; feeding, oilseed rape	DM
L023	River Deel	29/12/2022	09:30	Lapwing	80	arable crops; feeding, oilseed rape	DM
-	River Deel	29/12/2022	09:30	Cormorant	1	depositing/lowland rivers; feeding, River Deel	DM
-	Stoneyford river	29/12/2022	10:30	Lesser Black-backed Gull	2	depositing/lowland rivers and improved agricultural grassland; travelling, juveniles	DM
-	N51 E of Delvin	29/12/2022	11:15	Lesser Black-backed Gull	2	improved agricultural grassland; roosting, flooded field	DM
L024	N51 E of Delvin	29/12/2022	11:15	Lapwing	2	improved agricultural grassland; roosting, flooded field	DM
-	Crowinstown lake	29/12/2022	11:45	Herring Gull	4	lakes and ponds and improved agricultural grassland; travelling	DM
WS057	Annalla fields	29/12/2022	12:30	Whooper Swan	51	improved agricultural grassland; feeding	DM
-	Annalla fields	29/12/2022	12:30	Mute Swan	8	improved agricultural grassland; feeding	DM
-	Johnstown Lakes	29/12/2022	13:15	Wigeon	22	lakes and ponds; roosting	DM
-	Johnstown Lakes	29/12/2022	13:15	Mallard	5	lakes and ponds; roosting	DM
-	Annalla lakes	29/12/2022	13:45	Mute Swan	4	lakes and ponds; feeding	DM
-	Annalla lakes	29/12/2022	13:45	Moorhen	7	lakes and ponds; feeding	DM
-	Annalla lakes	29/12/2022	13:45	Little Grebe	2	lakes and ponds; feeding	DM
-	Annalla lakes	29/12/2022	13:45	Cormorant	1	lakes and ponds; travelling	DM

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Annalla lakes	29/12/2022	13:45	Wigeon	22	lakes and ponds; travelling	DM
-	Reynella Lakes	29/12/2022	14:45	Mute Swan	4	lakes and ponds and improved agricultural grassland; feeding, 2 in field	DM
-	Reynella Lakes	29/12/2022	14:45	Mallard	2	lakes and ponds; feeding	DM
-	N of Killucan	29/12/2022	15:00	Teal	38	improved agricultural grassland; feeding, flooded field	DM
-	Crowinstown Lake	13/01/2023	09:55	Mallard	2	dystrophic lakes; swimming	EF
-	Delvin Pond	13/01/2023	10:40	Mallard	3	dystrophic lakes; swimming	EF
-	Near Ballyhealy Lake	13/01/2023	11:05	Common Gull	2	dystrophic lakes; flying	EF
WS058	Annalla Fields	13/01/2023	12:00	Whooper Swan	23	dystrophic lakes; foraging/resting in fields	EF
-	Derrymore Springs	13/01/2023	13:50	Little Grebe	3	dystrophic lakes; swimming/diving	EF
-	Derrymore Springs	13/01/2023	13:50	Mallard	1	dystrophic lakes; swimming	EF
-	Derrymore Springs	13/01/2023	13:50	Grey Heron	1	dystrophic lakes; standing on island	EF
-	Derrymore Springs	13/01/2023	13:50	Moorhen	2	dystrophic lakes; swimming	EF
-	East of Kilcullen	13/01/2023	14:30	Mute Swan	2	dystrophic lakes; swimming in flood	EF
WS059	East of Kilcullen	13/01/2023	14:30	Whooper Swan	5	dystrophic lakes; foraging in field	EF
-	East of Kilcullen	13/01/2023	14:30	Herring Gull	12	dystrophic lakes; foraging in field	EF
WS060	Athboy	13/01/2023	15:15	Whooper Swan	52	dystrophic lakes; foraging in flooded field	EF
L025	NW of River Deel	31/01/2023	14:20	Lapwing	30	dystrophic lakes; flying/may have landed, lost to view	EF
WS061	Shay Murtagh Lakes	31/01/2023	15:20	Whooper Swan	28	dystrophic lakes; foraging/resting, may have been more out of view	EF
-	Derrymore Springs	31/01/2023	15:50	Little Grebe	2	dystrophic lakes; swimming/diving	EF
-	Derrymore Springs	31/01/2023	15:50	Mallard	2	dystrophic lakes; resting on island	EF
L026	Athboy	14/02/2023	09:45	Lapwing	22	dystrophic lakes; resting beside flood in field	EF
-	Athboy	14/02/2023	09:45	Shelduck	2	dystrophic lakes; swimming in flood	EF
-	Crowinstown Lake	14/02/2023	10:15	Moorhen	1	dystrophic lakes; swimming in lake	EF
-	Crowinstown Lake	14/02/2023	10:25	Water Rail	1	dystrophic lakes; calling from reedbed	EF
-	Delvin Pond	14/02/2023	10:45	Mallard	4	dystrophic lakes; resting beside pond	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Billistown	14/02/2023	10:55	Teal	3	dystrophic lakes; swimming in marsh	EF
WS062	Annalla Fields	14/02/2023	11:05	Whooper Swan	51	dystrophic lakes; foraging/resting in field	EF
-	Joristown	14/02/2023	12:30	Teal	19	dystrophic lakes; swimming in flood/pond	EF
L027	Joristown	14/02/2023	12:30	Lapwing	13	dystrophic lakes; resting beside flood	EF
WS063	Joristown	14/02/2023	12:30	Whooper Swan	1	dystrophic lakes; standing in flood	EF
KF017	River Deel	14/02/2023	14:30	Kingfisher	1	dystrophic lakes; perched below bridge on tree	EF
WS064	River Deel	14/02/2023	15:00	Whooper Swan	35	dystrophic lakes; resting/foraging in field	EF
-	Derrymore Springs	14/02/2023	15:15	Little Grebe	2	dystrophic lakes; swimming/diving	EF
L028	East of Kilcullen	14/02/2023	15:45	Lapwing	30	dystrophic lakes; flying	EF
-	Delvin Pond	27/02/2023	10:15	Mallard	2	dystrophic lakes; swimming	EF
-	Billistown	27/02/2023	10:25	Grey Heron	1	dystrophic lakes; standing in marsh	EF
WS065	Annalla Fields	27/02/2023	10:40	Whooper Swan	32	dystrophic lakes; foraging/resting	EF
-	NE Annalla Lake	27/02/2023	10:55	Mallard	8	dystrophic lakes; swimming in flood/pond?	EF
-	SW Annalla Fields-N52	27/02/2023	11:10	Mute Swan	1	dystrophic lakes; swimming, in fenced off drainage pond	EF
-	River Deel	27/02/2023	11:25	Mute Swan	2	dystrophic lakes; swimming on river near bridge	EF
-	Annalla Lakes	27/02/2023	11:45	Cormorant	11	dystrophic lakes; perched in tree/flew	EF
-	Annalla Lakes	27/02/2023	11:45	Mute Swan	4	dystrophic lakes; swimming on lake	EF
-	Annalla Lakes	27/02/2023	11:50	Mallard	2	dystrophic lakes; flying	EF
-	Annalla Lakes	27/02/2023	11:50	Pochard	3	dystrophic lakes; swimming on lake, 2 males, 1 female	EF
-	Annalla Lakes	27/02/2023	11:50	Teal	7	dystrophic lakes; resting/swimming close to reedbed	EF
-	Annalla Lakes	27/02/2023	11:50	Moorhen	2	dystrophic lakes; calling from reedbeds	EF
-	Johnstown Lakes	27/02/2023	12:15	Cormorant	1	dystrophic lakes; swimming	EF
-	Joristown	27/02/2023	13:30	Teal	8	dystrophic lakes; swimming	EF
-	Derrymore Springs	27/02/2023	14:25	Gadwall	1	dystrophic lakes; swimming, male	EF
-	Derrymore Springs	27/02/2023	14:25	Little Grebe	3	dystrophic lakes; swimming/diving	EF
-	Derrymore Springs	27/02/2023	14:25	Mallard	3	dystrophic lakes; flushed/flying/swimming	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Derrymore Springs	27/02/2023	14:25	Moorhen	1	dystrophic lakes; flew across lake towards island	EF
-	Derrymore Springs	27/02/2023	14:25	Mute Swan	1	dystrophic lakes; swimming	EF
-	Shay Murtagh Lakes	20/03/2023	09:41	Coot	2	lakes and ponds; on water	KS
-	Shay Murtagh Lakes	20/03/2023	09:48	Tufted Duck	6	lakes and ponds; on water	KS
-	Shay Murtagh Lakes	20/03/2023	09:48	Mallard	1	lakes and ponds; on water	KS
ET008	Shay Murtagh Lakes	20/03/2023	09:48	Little Egret	1	lakes and ponds; flushed	KS
-	Reynella Lakes	20/03/2023	12:59	Mute Swan	2	lakes and ponds; on water	KS
-	Reynella Lakes	20/03/2023	12:59	Teal	12	lakes and ponds; flushed	KS
-	Reynella Lakes	20/03/2023	12:59	Mallard	2	lakes and ponds; on water	KS
-	Reynella Lakes	20/03/2023	12:59	Grey Heron	1	lakes and ponds; foraging	KS
-	Reynella Lakes	20/03/2023	12:59	Moorhen	1	lakes and ponds; call	KS
WS066	Annalla fields	20/03/2023	14:17	Whooper Swan	60	improved agricultural grassland; foraging	KS
-	Billistown	20/03/2023	14:17	Teal	6	lakes and ponds; on water	KS
-	Billistown	20/03/2023	14:17	Moorhen	2	lakes and ponds; on water	KS
-	Annalla Lakes	20/03/2023	14:37	Cormorant	5	scattered tress and parkland and lakes and ponds; in tree	KS
GP009	North of Annalla	20/03/2023	14:38	Golden Plover	150	improved agricultural grassland; circling	KS
GP010	South of crowinstown	20/03/2023	15:14	Golden Plover	3	arable crops; roosting, in stubble field	KS
L029	South of crowinstown	20/03/2023	15:14	Lapwing	2	arable crops; display, in stubble field	KS
WS067	Crowinstown lake	20/03/2023	15:18	Whooper Swan	1	lakes and ponds; on water	KS
SN016	Reynella Lakes	31/03/2023	11:08	Snipe	2	dry calcareous and neutral grassland; flushed	KS
-	Reynella Lakes	31/03/2023	11:08	Little Grebe	2	lakes and ponds; calling, GS drumming on trees also	KS
-	Annalla lakes	31/03/2023	12:06	Mute Swan	4	lakes and ponds; on water	KS
-	Annalla lakes	31/03/2023	12:06	Cormorant	4	scattered tress and parkland; perched	KS
-	Annalla lakes	31/03/2023	12:06	Mallard	1	lakes and ponds; on water	KS
-	Annalla lakes	31/03/2023	12:14	Mute Swan	2	lakes and ponds; on water	KS
-	Annalla lakes	31/03/2023	12:14	Cormorant	1	lakes and ponds; perched	KS



Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Johnstown Lakes	31/03/2023	12:35	Mallard	4	lakes and ponds; on water	KS
WS068	Annalla fields	31/03/2023	13:00	Whooper Swan	42	improved agricultural grassland; foraging	KS

Appendix 1 Table 6 Hen Harrier Roost Survey Observations

Ref.	HHVP	Date	Time	Species	Number	Habitat and activity	Surveyor
HH004	HHVP4	06/12/2022	15:00	Hen Harrier	1	cutover bog, flight then abrupt landing	MW
HH005	HHVP4	06/12/2022	15:20	Hen Harrier	2	cutover bog and ornamental/non-native shrub, slowly descending flight, out of view behind distant trees	MW
HH006	HHVP4	06/12/2022	15:45	Hen Harrier	1	cutover bog and ornamental/non-native shrub, flight then abrupt landing	MW

Appendix 1 Table 7 Incidental Observations

Map Ref	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN109	Hen Harrier Roost Survey, hhvp1	13/10/2022	17:04	Snipe	3	cutover bog; flushed flight	NM
PE008	Hen Harrier Roost Survey, hhvp1	13/10/2022	17:47	Peregrine Falcon	1	cutover bog and conifer plantation; travelling	NM
ML006	Hen Harrier Roost Survey, hhvp1	13/10/2022	17:53	Merlin	1	cutover bog, conifer plantation and improved agricultural grassland; travelling	NM
WS018	Hen Harrier Roost Survey, hhvp1	13/10/2022	18:34	Whooper Swan	1	cutover bog and conifer plantation; travelling	NM
K029	Hen Harrier Roost Survey, hhvp1	13/10/2022	18:35	Kestrel	1	cutover bog; travelling	NM
WS019	Hen Harrier Roost Survey, hhvp1	13/10/2022	18:59	Whooper Swan	11	cutover bog, conifer plantation and improved agricultural grassland; travelling	NM
BZ153	Vantage Point Survey, vp14	14/10/2022	12:46	Buzzard	1	scrub and conifer plantation; heard not seen, path guessed	MW
BZ154	Hen Harrier Roost Survey, hhvp2	14/10/2022	17:32	Buzzard	1	cutover bog and conifer plantation; travelling/mobbed	NM
-	Hen Harrier Roost Survey, hhvp2	14/10/2022	18:01	Grey Heron	1	cutover bog and conifer plantation; travelling	NM
SN110	Hen Harrier Roost Survey, hhvp2	14/10/2022	18:17	Snipe	1	cutover bog; travelling	NM
WS020	Hen Harrier Roost Survey, hhvp2	14/10/2022	18:28	Whooper Swan	11	cutover bog, conifer plantation and improved agricultural grassland; travelling	NM
-	Wintering Golden Plover Survey, Crowinstown lake	16/10/2022	15:25	Mute Swan	1	lakes and ponds; swimming on lake	EF
BZ197	Wintering Golden Plover Survey, Crowinstown	16/10/2022	15:25	Buzzard	1	lakes and ponds and highly modified/non-native woodland; flying	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	13:05	Great Crested Grebe	1	lakes and ponds; swimming on lake	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	13:05	Moorhen	1	lakes and ponds; swimming on lake	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	13:20	Mute Swan	3	lakes and ponds; swimming on lake	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	13:20	Little Grebe	6	lakes and ponds; swimming on lake	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	13:25	Cormorant	1	lakes and ponds; flying across lake	EF
K030	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	15:45	Kestrel	1	bogs; hovering/flying	EF
BZ155	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	16:00	Buzzard	2	bogs; circling/flying	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	16:15	Cormorant	1	bogs; flying	EF
SH034	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	17:10	Sparrowhawk	1	bogs; flew up road in front of van	EF
BZ156	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	17:20	Buzzard	1	bogs; sitting on top of telegraph pole	EF
-	Wintering Golden Plover Survey, 12km survey radius	25/10/2022	17:55	Redwing	20	bogs; flying/landed, best count of the day. smaller numbers earlier	EF
-	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	09:45	Grey Heron	1	bogs; standing in field	EF
BZ157	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	10:55	Buzzard	1	bogs; standing in field	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
BZ158	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	11:20	Buzzard	2	bogs; flying/circling	EF
BZ159	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	12:45	Buzzard	1	bogs; circling/flying	EF
-	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	13:05	Grey Wagtail	1	bogs; flew along road at bridge	EF
-	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	13:30	Redwing	14	bogs; flying	EF
BZ160	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	14:35	Buzzard	1	bogs; flying	EF
-	Wintering Golden Plover Survey, 12km survey radius	26/10/2022	15:30	Lesser Black-Backed Gull	12	improved grassland; standing in field/flying	EF
-	Vantage Point Survey, vp11	27/10/2022	10:20	Grey Wagtail	2	heath and scrub; flushed/flying/calling	EF
WK022	Hen Harrier Roost Survey, hhvp3	01/11/2022	18:10	Woodcock	2	cutover bog; low flight	MW
K031	Hen Harrier Roost Survey, hhvp4	02/11/2022	15:20	Kestrel	1	improved agricultural grassland; hunting	MW
K032	Hen Harrier Roost Survey, hhvp4	02/11/2022	16:00	Kestrel	1	cutover bog; hunting	MW
-	Vantage Point Survey, vp1	08/11/2022	16:16	Redwing	10	cutover bog; flying s into trees	SP
K033	Vantage Point Survey, vp13	08/11/2022	11:57	Kestrel	1	cutover bog; hunting	MW
BZ161	Vantage Point Survey, vp11	15/11/2022	15:20	Buzzard	2	scrub; slow circling for 8-9 mins	MW
BO013	Vantage Point Survey, vp11	15/11/2022	17:45	Barn Owl	1	improved agricultural grassland; perched, then hunting, perched on branch above track. after 90 seconds bird was excited and flew into paddocks south of track, but out of view.	MW

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN111	Vantage Point Survey, vp4	18/11/2022	10:55	Snipe	7	cutover bog and watercourses; flushed flight, area flooded	NM
BZ162	Vantage Point Survey, vp9	18/11/2022	13:45	Buzzard	1	cutover bog; circling	MW
-	Vantage Point Survey, vp10	21/11/2022	14:16	Redwing	2	scrub; flight, perching	MW
K034	Hen Harrier Roost Survey, hhvp2	21/11/2022	15:27	Kestrel	1	cutover bog; hunting	NM
-	Vantage Point Survey, vp15	22/11/2022	10:40	Mute Swan	1	cutover bog and scrub; walking near railway line, juvenile	EF
SN112	Vantage Point Survey, vp7	22/11/2022	10:55	Snipe	1	cutover bog; flushed flight	NM
-	Vantage Point Survey, vp10	23/11/2022	06:50	Stock Dove	2	cutover bog; flying w	SP
-	Wintering Golden Plover Survey, 12km survey radius	23/11/2022	10:20	Redwing	8	lakes and ponds; fly/landed	EF
BZ163	Wintering Golden Plover Survey, 12km survey radius	23/11/2022	10:40	Buzzard	1	scrub; perched in tree	EF
-	Wintering Golden Plover Survey, 12km survey radius	23/11/2022	12:30	Grey Heron	1	canals; feeding on fish on bank of canal	EF
-	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	09:00	Redwing	18	hedgerows; flying/landed in tree	EF
-	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	09:25	Lesser Black-Backed Gull	11	cultivated land; fly/land in field	EF
WS021	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	10:00	Whooper Swan	23	cultivated land; resting in harvested potato field	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	10:55	Herring Gull	17	cultivated land; foraging in field	EF
-	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	10:55	Grey Heron	1	cultivated land; foraging in field	EF
BZ164	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	14:10	Buzzard	1	lakes and ponds; flying/hovering	EF
BZ165	Wintering Golden Plover Survey, 12km survey radius	24/11/2022	14:35	Buzzard	3	lakes and ponds; flying	EF
GP035	Vantage Point Survey, vp3	30/11/2022	10:41	Golden Plover	140	cutover bog; flight	MW
-	Vantage Point Survey, vp3	30/11/2022	10:43	Meadow Pipit	8	cutover bog; flushed and returned to bog	MW
SN113	Vantage Point Survey, vp3	30/11/2022	10:45	Snipe	2	cutover bog; flushed	MW
WS022	Vantage Point Survey, vp3	30/11/2022	12:12	Whooper Swan	6	cutover bog; flight	MW
SN114	Vantage Point Survey, vp11	05/12/2022	07:20	Snipe	2	cutover bog; flushed	KB
SH035	Waterbird Distribution Survey, Annalla lakes	07/12/2022	14:30	Sparrowhawk	1	mixed broadleaved/conifer woodland and improved agricultural grassland; hunting, female	DM
SH036	Waterbird Distribution Survey, Reynella lake	07/12/2022	15:30	Sparrowhawk	1	mixed broadleaved/conifer woodland and improved agricultural grassland; hunting, juv. female	DM
K035	Hen Harrier Roost Survey, hhvp3	14/12/2022	15:25	Kestrel	1	cutover bog; hunting	NM
ML007	Hen Harrier Roost Survey, hhvp1	15/12/2022	16:18	Merlin	1	cutover bog; travelling west, bird observed travelling low at speed across bog	NM
K036	Hen Harrier Roost Survey, hhvp2	21/12/2022	15:43	Kestrel	1	bogs and conifer plantation; hunting	NM

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	09:15	Redwing	19	semi-natural grassland; foraging with ff, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	09:35	Black-Headed Gull	3	semi-natural grassland; flew overhead, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:40	Mute Swan	1	lakes and ponds; swimming in reedbed, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:50	Little Grebe	3	limestone/marl lakes; swimming/diving, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:50	Mute Swan	2	limestone/marl lakes; swimming in reedbed, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:50	Grey Heron	1	limestone/marl lakes; standing on shore, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:50	Cormorant	5	limestone/marl lakes; swimming/flying, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:50	Great Crested Grebe	2	limestone/marl lakes; swimming/diving, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	10:55	Goldeneye	15	limestone/marl lakes; flying/landed/swimming/diving, wintering golden plover survey	EF
BZ166	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	13:20	Buzzard	1	semi-natural grassland; flying, wintering golden plover survey	EF
	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	13:30	Teal	5	semi-natural grassland; swimming in corner of field that was flooded, wintering golden plover survey	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
BZ167	Wintering Golden Plover Survey, 12km survey radius	23/12/2022	14:50	Buzzard	1	bogs and scrub; flying, wintering golden plover survey	EF
K037	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	09:35	Kestrel	1	semi-natural grassland; flying, wintering golden plover survey	EF
-	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	09:45	Teal	3	lakes and ponds; swimming on lake/pond, wintering golden plover survey	EF
WS023	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	10:30	Whooper Swan	23	disturbed ground; resting in ploughed field, wintering golden plover survey	EF
BZ168	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	11:40	Buzzard	1	scrub; flew/landed on telegraph pole, wintering golden plover survey	EF
-	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	14:10	Redwing	14	cultivated land; foraging with flock of ff, wintering golden plover survey	EF
BZ169	Wintering Golden Plover Survey, 12km survey radius	27/12/2022	14:20	Buzzard	1	improved agricultural grassland; flying, wintering golden plover survey	EF
BZ170	Waterbird Distribution Survey, river Deel	29/12/2022	10:00	Buzzard	1	depositing/lowland rivers and improved agricultural grassland; hunting	DM
BZ171	Waterbird Distribution Survey, Stoneyford river	29/12/2022	10:30	Buzzard	2	depositing/lowland rivers and improved agricultural grassland; hunting	DM
BZ172	Waterbird Distribution Survey, Reynella lake	29/12/2022	14:45	Buzzard	1	mixed broadleaved/conifer woodland; perched	DM
-	Hen Harrier Roost Survey, hhvp1	10/01/2023	16:07	Meadow Pipit	1	cutover bog; flitting	EOB
K038	Hen Harrier Roost Survey, hhvp1	10/01/2023	16:29	Kestrel	1	cutover bog; hunting	EOB
GP036	Vantage Point Survey, vp6	11/01/2023	10:45	Golden Plover	55	cutover bog; circling	KS

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN115	Vantage Point Survey, vp6	11/01/2023	10:47	Snipe	1	cutover bog; flushed	KS
WK023	Vantage Point Survey, vp6	11/01/2023	10:50	Woodcock	1	cutover bog and heath; flushed	KS
L018	Vantage Point Survey, vp6	11/01/2023	14:25	Lapwing	100	cutover bog; circling, estimate on flock	KS
SH037	Waterbird Distribution Survey, Crowinstown lake	13/01/2023	09:50	Sparrowhawk	1	lakes and ponds; flew from tree	EF
BZ173	Waterbird Distribution Survey, Annalla fields	13/01/2023	11:55	Buzzard	1	lakes and ponds; flying	EF
-	Waterbird Distribution Survey, Murtagh lake	13/01/2023	12:40	Redwing	13	lakes and ponds; flying across road	EF
BZ174	Waterbird Distribution Survey, Murtagh lake	13/01/2023	12:45	Buzzard	1	lakes and ponds; flew from tree	EF
BZ175	Waterbird Distribution Survey, Stoneyford river	13/01/2023	15:45	Buzzard	1	lakes and ponds; perched on post	EF
K039	Vantage Point Survey, vp3	17/01/2023	14:04	Kestrel	1	cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
K040	Vantage Point Survey, vp3	17/01/2023	14:20	Kestrel	1	cutover bog and mixed broadleaved/conifer woodland; hunting	EOB
BZ176	Vantage Point Survey, vp3	17/01/2023	14:24	Buzzard	1	conifer plantation; hunting	EOB
-	Vantage Point Survey, vp3	17/01/2023	14:26	Meadow Pipit	5	cutover bog; flitting	EOB
GP037	Vantage Point Survey, vp5	23/01/2023	10:40	Golden Plover	1	cutover bog; flying calling	EOB
K041	Hen Harrier Roost Survey, hhvp4	25/01/2023	15:00	Kestrel	1	cutover bog and conifer plantation; hunting	FLM
BZ177	Hen Harrier Roost Survey, hhvp4	25/01/2023	17:16	Buzzard	2	cutover bog and conifer plantation; travelling, too far away to confirm, 2 large dark birds flying low and together at 17.16, 20 minutes after sunset.	FLM
-	Vantage Point Survey, vp1	26/01/2023	10:50	Yellowhammer	1	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flushed and flew	EOB

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN116	Vantage Point Survey, vp1	26/01/2023	10:52	Snipe	1	cutover bog and drainage ditches; flying	EOB
SN117	Hen Harrier Roost Survey, hhvp2	30/01/2023	07:05	Snipe	1	drainage ditches, cutover bog and mixed broadleaved/conifer woodland; calling, heard	EOB
SN118	Hen Harrier Roost Survey, hhvp2	30/01/2023	07:15	Snipe	1	cutover bog; calling flushed, heard	EOB
SN119	Hen Harrier Roost Survey, hhvp2	30/01/2023	07:27	Snipe	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flying, disturbance	EOB
SN120	Hen Harrier Roost Survey, hhvp2	30/01/2023	07:58	Snipe	1	mixed broadleaved/conifer woodland, cutover bog and improved agricultural grassland; perched on tree, 425 seconds	EOB
SN121	Hen Harrier Roost Survey, hhvp2	30/01/2023	08:27	Snipe	2	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flying	EOB
SN122	Hen Harrier Roost Survey, hhvp2	30/01/2023	08:29	Snipe	2	cutover bog and mixed broadleaved/conifer woodland; flew then landed, possibly same pair seen 08:27	EOB
SN123	Hen Harrier Roost Survey, hhvp2	30/01/2023	08:31	Snipe	2	cutover bog and improved agricultural grassland; flying	EOB
SN124	Hen Harrier Roost Survey, hhvp2	30/01/2023	09:09	Snipe	1	cutover bog and improved agricultural grassland; hunting, hovering mostly	EOB
SN125	Hen Harrier Roost Survey, hhvp2	30/01/2023	10:06	Snipe	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flitting	EOB
BZ198	Hen Harrier Roost Survey, 2	30/01/2023	07:58	Buzzard		;	EOB
K045	Hen Harrier Roost Survey, 2	30/01/2023	09:09	Kestrel	1	cutover bog and improved agricultural grassland; hunting, hovering mostly	EOB
BZ178	Waterbird Distribution Survey, n51 near Crowinstown	31/01/2023	10:15	Buzzard	1	lakes and ponds; flying	EF
BZ179	Waterbird Distribution Survey, Johnstown lake	31/01/2023	11:55	Buzzard	1	lakes and ponds; flying	EF
BZ180	Waterbird Distribution Survey, Graftonstown	31/01/2023	13:45	Buzzard	1	lakes and ponds; flying	EF
BZ181	Waterbird Distribution Survey, river Deel	31/01/2023	15:00	Buzzard	1	lakes and ponds; flying	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
BZ182	Waterbird Distribution Survey, river Deel	31/01/2023	15:05	Buzzard	1	lakes and ponds; flying	EF
K042	Waterbird Distribution Survey, river Deel	31/01/2023	15:15	Kestrel	1	lakes and ponds; hovering	EF
BZ183	Waterbird Distribution Survey, east of Kilcullen	31/01/2023	16:00	Buzzard	1	lakes and ponds; flying	EF
-	Vantage Point Survey, vp15	02/02/2023	07:00	Stock Dove	1	cutover bog; flying se	SP
-	Vantage Point Survey, vp15	02/02/2023	18:20	Snipe	2	cutover bog; calling, flying w	SP
-	Vantage Point Survey, vp1	02/02/2023	13:50	Snipe	2	cutover bog and drainage ditches; flushed and flew	EOB
-	Vantage Point Survey, vp1	02/02/2023	13:52	Snipe	1	cutover bog and drainage ditches; flushed and flew	EOB
SN132	Vantage Point Survey, 1	02/02/2023	13:50	Sn	2	;	EOB
SN133	Vantage Point Survey, 1	02/02/2023	13:52	Sn	1	;	EOB
-	Hen Harrier Roost Survey, hhvp1	03/02/2023	06:55	Snipe	1	cutover bog and drainage ditches; flushed and flew	EOB
-	Hen Harrier Roost Survey, hhvp1	03/02/2023	08:32	Meadow Pipit	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; flitting, heard	EOB
SN134	Hen Harrier Roost Survey, 1	03/02/2023	06:55	Sn	1	;	EOB
-	Vantage Point Survey, vp12	09/02/2023	08:50	Stock Dove	2	cutover bog; flying w	SP
-	Vantage Point Survey, vp12	09/02/2023	06:45	Stock Dove	1	cutover bog; flying w	SP
-	Hen Harrier Roost Survey, hhvp2	10/02/2023	07:05	Snipe	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; calling	EOB
-	Hen Harrier Roost Survey, hhvp2	10/02/2023	07:11	Snipe	1	cutover bog and drainage ditches; calling	EOB
-	Hen Harrier Roost Survey, hhvp2	10/02/2023	07:11	Mallard	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; calling flew, heard not seen	EOB

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
-	Hen Harrier Roost Survey, hhvp3	10/02/2023	13:25	Kestrel	1	raised bog; traveling	FLM
BZ184	Hen Harrier Roost Survey, hhvp3	10/02/2023	14:45	Buzzard	3	raised bog; circling	FLM
K046	Hen Harrier Roost Survey, vp3	10/02/2023	13:25	Kestrel	1	raised bog; traveling	EOB
SN136	Hen Harrier Roost Survey, 2	10/02/2023	07:11	Sn	1	;	EOB
-	Waterbird Distribution Survey, Crowinstown	14/02/2023	10:35	Redwing	11	lakes and ponds; flying/calling	EF
BZ185	Waterbird Distribution Survey, Joristown	14/02/2023	12:30	Buzzard	1	lakes and ponds; flying	EF
BZ186	Waterbird Distribution Survey, river Deel	14/02/2023	14:00	Buzzard	1	lakes and ponds; flying	EF
BZ187	Waterbird Distribution Survey, east of Kilcullen	14/02/2023	15:35	Buzzard	1	lakes and ponds; soaring	EF
-	Hen Harrier Roost Survey, hhvp4	14/02/2023	08:00	Redwing	1	raised bog; travelling	FLM
BZ188	Hen Harrier Roost Survey, hhvp4	14/02/2023	08:30	Buzzard	1	raised bog; flying over	FLM
-	Hen Harrier Roost Survey, hhvp4	14/02/2023	08:44	Meadow Pipit	6	raised bog; flying from roost	FLM
-	Hen Harrier Roost Survey, hhvp4	14/02/2023	09:30	Yellowhammer	1	oak-ash-hazel woodland and raised bog; flying off	FLM
-	Vantage Point Survey, vp8	17/02/2023	06:27	Woodcock	1	cutover bog and immature woodland; flushed	KB
WK024		17/02/2023	06:28	Woodcock	0		KB
-	Vantage Point Survey, vp13	18/02/2023	06:30	Snipe	1	cutover bog; flight call, seen whilst walking to vp16	EF
-	Vantage Point Survey, vp16	18/02/2023	06:40	Teal	2	cutover bog; flying, seen whilst walking to vp16	EF
-	Vantage Point Survey, vp16	18/02/2023	09:50	Snipe	5	cutover bog; flushed, on a walk during break	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN137	Vantage Point Survey, close to vp13	18/02/2023	06:30	Snipe	1		EF
SN138	Vantage Point Survey, vp16 viewshed	18/02/2023	09:50	Snipe	5		EF
-	Vantage Point Survey, vp5	21/02/2023	09:38	Snipe	2	cutover bog; flushed	KB
SN139		21/02/2023	09:07	Snipe	0		KB
-	Vantage Point Survey, vp6	27/02/2023	06:10	Mallard	1	drainage ditches and cutover bog; flushed	KB
BZ189	Waterbird Distribution Survey, Annalla lakes	27/02/2023	11:25	Buzzard	1	lakes and ponds; flying	EF
BZ190	Waterbird Distribution Survey, Annalla lakes	27/02/2023	11:40	Buzzard	1	lakes and ponds; flying	EF
BZ191	Waterbird Distribution Survey, river Deel	27/02/2023	15:10	Buzzard	1	lakes and ponds; flying	EF
-	Vantage Point Survey, vp13	03/03/2023	07:00	Stock Dove	2	cutover bog; flying nw	SP
-	Hen Harrier Roost Survey, hhvp1	03/03/2023	06:22	Mallard	1	cutover bog, drainage ditches and immature woodland; calling, heard	EOB
SN126	Hen Harrier Roost Survey, hhvp1	03/03/2023	06:25	Snipe	1	cutover bog and drainage ditches; calling	EOB
SN127	Hen Harrier Roost Survey, hhvp1	03/03/2023	06:31	Snipe	1	cutover bog and drainage ditches; calling	EOB
-	Hen Harrier Roost Survey, hhvp1	03/03/2023	07:18	Meadow Pipit	1	cutover bog and drainage ditches; calling	EOB
-	Hen Harrier Roost Survey, hhvp1	03/03/2023	07:52	Meadow Pipit	2	cutover bog and drainage ditches; flitting	EOB
ML008	Hen Harrier Roost Survey, hhvp1	03/03/2023	08:15	Merlin	1	mixed broadleaved/conifer woodland, cutover bog and drainage ditches; hunting, behaviour of a merlin. brief glimpse.	EOB
SN128	Hen Harrier Roost Survey, hhvp1	03/03/2023	08:34	Snipe	1	cutover bog and drainage ditches; flushed and flew	EOB
BZ192	Vantage Point Survey, vp3	07/03/2023	15:36	Buzzard	2	cutover bog; soaring	EOB

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
SN129	Vantage Point Survey, vp6	08/03/2023	12:18	Snipe	1	cutover bog and mixed broadleaved/conifer woodland; flying flushed	EOB
K043	Vantage Point Survey, vp6	08/03/2023	15:36	Kestrel	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; hovering hunting	EOB
GP038	Vantage Point Survey, vp4	13/03/2023	15:48	Golden Plover	1	cutover bog and drainage ditches; calling, heard	EOB
-	Vantage Point Survey, vp4	13/03/2023	15:50	Mallard	2	drainage ditches and cutover bog; flushed flew	EOB
-	Vantage Point Survey, vp5	15/03/2023	15:42	Mallard	2	cutover bog, drainage ditches and depositing/lowland rivers; flying circled	EOB
-	Wintering Golden Plover Survey, Athboy river	16/03/2023	10:15	Cormorant	1	depositing/lowland rivers; flying along river, wintering golden plover	EF
-	Wintering Golden Plover Survey, Trimblestown	16/03/2023	10:50	Redwing	19	arable crops; fly/land in stubble field, wintering golden plover	EF
L019	Wintering Golden Plover Survey, Athboy	16/03/2023	11:10	Lapwing	14	improved agricultural grassland; foraging at edge of flood in field, wintering golden plover	EF
-	Wintering Golden Plover Survey, Athboy	16/03/2023	11:10	Teal	3	improved agricultural grassland; foraging at edge of flood in field, wintering golden plover	EF
-	Wintering Golden Plover Survey, river Boyne	16/03/2023	11:50	Stock Dove	2	improved agricultural grassland; fly/land/fly, wintering golden plover	EF
-	Wintering Golden Plover Survey, river Boyne	16/03/2023	12:45	Cormorant	1	depositing/lowland rivers; flying along river, wintering golden plover. recorded during lunch break	EF
BZ193	Wintering Golden Plover Survey, east of Moyvalley	16/03/2023	13:25	Buzzard	2	semi-natural grassland; flying together, wintering golden plover	EF
BZ194	Wintering Golden Plover Survey, 12km survey radius	16/03/2023	14:30	Buzzard	1	semi-natural woodland; flew across road, wintering golden plover	EF
BZ195	Wintering Golden Plover Survey, Bracklyn	16/03/2023	15:05	Buzzard	1	semi-natural woodland; circling over trees, wintering golden plover	EF
SN130	Hen Harrier Roost Survey, hhvp2	16/03/2023	06:15	Snipe	1	cutover bog and drainage ditches; flying flushed	EOB
-	Hen Harrier Roost Survey, hhvp2	16/03/2023	06:49	Moorhen	1	cutover bog and drainage ditches; calling, heard	EOB

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
	Hen Harrier Roost Survey, hhvp2	16/03/2023	06:54	Yellowhammer	1	cutover bog and drainage ditches; calling, heard	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:12	Yellowhammer	2	cutover bog and drainage ditches; calling, heard	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:15	Meadow Pipit	6	cutover bog and drainage ditches; flitting, kestrel present	EOB
K044	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:17	Kestrel	1	cutover bog, drainage ditches and mixed broadleaved/conifer woodland; hovering hunting	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:17	Mallard	3	cutover bog, mixed broadleaved/conifer woodland and drainage ditches; flying circling	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:29	Meadow Pipit	4	cutover bog and drainage ditches; flitting	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:32	Mallard	1	mixed broadleaved/conifer woodland, cutover bog and drainage ditches; flying	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:43	Mallard	1	cutover bog and drainage ditches; flying commuting	EOB
GP039	Hen Harrier Roost Survey, hhvp2	16/03/2023	07:55	Golden Plover	57	improved agricultural grassland, cutover bog and mixed broadleaved/conifer woodland; flying circling	EOB
	Hen Harrier Roost Survey, hhvp2	16/03/2023	08:01	Mallard	1	conifer plantation, cutover bog and drainage ditches; commuting, glimpsed for few seconds	EOB
	Vantage Point Survey, vp14	20/03/2023	06:45	Redwing	2	cutover bog; flying nw	SP
PE009	Vantage Point Survey, between vp13 and vp15	20/03/2023	12:45	Peregrine Falcon	1	cutover bog; flying	EF
SN131	Vantage Point Survey, vp16	20/03/2023	16:30	Snipe	3	cutover bog; flushed	EF
WS024	Wintering Golden Plover Survey, Annalla fields	24/03/2023	10:35	Whooper Swan	44	improved grassland; foraging/resting, wintering golden plover. in 2 groups	EF
	Wintering Golden Plover Survey, Annalla lakes	24/03/2023	10:45	Mallard	2	lakes and ponds; swimming male and female, wintering golden plover	EF
	Wintering Golden Plover Survey, river Deel	24/03/2023	11:00	Mute Swan	2	watercourses and depositing/lowland rivers; swimming in river Deel, wintering golden plover	EF

Map Ref.	Location	Date	Time	Species	Number	Habitat and activity	Surveyor
	Wintering Golden Plover Survey, east of Crookedwood	24/03/2023	11:30	Mallard	2	improved grassland and improved agricultural grassland; flying male and female, wintering golden plover	EF
BZ196	Wintering Golden Plover Survey, Clondalee more	24/03/2023	14:10	Buzzard	1	semi-natural grassland, highly modified/non-native woodland and scrub/transitional woodland; flying, wintering golden plover	EF
	Wintering Golden Plover Survey, Clondalee bridge	24/03/2023	14:40	Grey Wagtail	1	watercourses and depositing/lowland rivers; fly/land, below bridge over river Deel. wintering golden plover	EF
	Wintering Golden Plover Survey, Clondalee bridge	24/03/2023	15:00	Lesser Black-Backed Gull	1	cultivated land and arable crops; flying, wintering golden plover	EF
	Wintering Golden Plover Survey, Derrymore springs	24/03/2023	15:20	Mute Swan	2	semi-natural grassland; foraging in field, wintering golden plover	EF
	Wintering Golden Plover Survey, Derrymore springs	24/03/2023	15:30	Mute Swan	3	semi-natural grassland; foraging in field, wintering golden plover	EF
	Wintering Golden Plover Survey, Derrymore springs	24/03/2023	15:35	Little Grebe	2	lakes and ponds; swimming, wintering golden plover	EF
	Wintering Golden Plover Survey, Derrymore springs	24/03/2023	15:35	Mallard	1	lakes and ponds; swimming, wintering golden plover	EF
	Wintering Golden Plover Survey, Derrymore springs	24/03/2023	15:35	Moorhen	2	lakes and ponds; calling/flushed from edge, wintering golden plover	EF
	Hen Harrier Roost Survey, hhvp4	27/03/2023	18:00	Meadow Pipit	3	raised bog; flying/ roosting	FLM
	Hen Harrier Roost Survey, hhvp4	27/03/2023	19:30	Yellowhammer	1	raised bog and improved agricultural grassland; roosting	FLM
	Hen Harrier Roost Survey, hhvp4	27/03/2023	19:30	Mallard	2	raised bog; flying to roost	FLM

Appendix 1 Table 8 Non-target Species Observations

Date	Survey	Species	Notes	Surveyor
06/10/2022	Vantage Point Survey, VP12	Skylark		MW
06/10/2022	Vantage Point Survey, VP12	Linnet		MW
06/10/2022	Vantage Point Survey, VP12	Mistle Thrush		MW
06/10/2022	Vantage Point Survey, VP12	Pied Wagtail		MW
06/10/2022	Vantage Point Survey, VP12	Rook		MW
06/10/2022	Vantage Point Survey, VP12	Raven		MW
06/10/2022	Vantage Point Survey, VP12	Hooded Crow		MW
06/10/2022	Vantage Point Survey, VP12	Magpie		MW
06/10/2022	Vantage Point Survey, VP12	Blackbird		MW
06/10/2022	Vantage Point Survey, VP12	Robin		MW
06/10/2022	Vantage Point Survey, VP12	Wren		MW
06/10/2022	Vantage Point Survey, VP12	Stonechat		MW
06/10/2022	Vantage Point Survey, VP12	Siskin		MW
06/10/2022	Vantage Point Survey, VP7	Reed Bunting	06:35 calling	SP
06/10/2022	Vantage Point Survey, VP7	Robin	x 4 calling	SP
06/10/2022	Vantage Point Survey, VP7	Wren	calling	SP
06/10/2022	Vantage Point Survey, VP7	Blackbird	calling	SP
06/10/2022	Vantage Point Survey, VP7	Dunnock	calling	SP
06/10/2022	Vantage Point Survey, VP7	Hooded Crow	calling	SP
06/10/2022	Vantage Point Survey, VP7	Common Redpoll	x 2 flying NW	SP
06/10/2022	Vantage Point Survey, VP7	Chaffinch	x 2 flying NW	SP
06/10/2022	Vantage Point Survey, VP7	Common Redpoll	x 2 fling n	SP
06/10/2022	Vantage Point Survey, VP7	Goldfinch	x3 flying s	SP
06/10/2022	Vantage Point Survey, VP7	Reed Bunting	x 1 flying s	SP
06/10/2022	Vantage Point Survey, VP7	Linnet	x 2 flying ne	SP
06/10/2022	Vantage Point Survey, VP7	Raven	x 1 flying SW	SP
06/10/2022	Vantage Point Survey, VP7	Chaffinch	x 2 flying SW 08:14	SP
06/10/2022	Vantage Point Survey, VP7	Goldfinch	x 10 flying ne	SP
06/10/2022	Vantage Point Survey, VP7	Jay	2 calling in trees	SP
06/10/2022	Vantage Point Survey, VP7	Siskin	x 3 flying e	SP
06/10/2022	Vantage Point Survey, VP7	Woodpigeon	x 2 flying e	SP
06/10/2022	Vantage Point Survey, VP7	Hooded Crow	x 1 flying ne	SP
06/10/2022	Vantage Point Survey, VP7	Pied Wagtail	x 1 flying se	SP
06/10/2022	Vantage Point Survey, VP7	Skylark	x 10 flying nw	SP
06/10/2022	Vantage Point Survey, VP7	Stonechat	x 1	SP
06/10/2022	Vantage Point Survey, VP7	Great Tit	x2 roving flock	SP
06/10/2022	Vantage Point Survey, VP7	Blue Tit	x 2 roving flock	SP
06/10/2022	Vantage Point Survey, VP7	Goldcrest	x 4 roving flock	SP
06/10/2022	Vantage Point Survey, VP7	Long-tailed Tit	x 30 roving flock	SP
06/10/2022	Vantage Point Survey, VP7	Bullfinch	x 2	SP
06/10/2022	Vantage Point Survey, VP7	Raven	x 1 flying SW	SP
06/10/2022	Vantage Point Survey, VP7	Common Redpoll	x 30 flying s	SP
06/10/2022	Vantage Point Survey, VP7	Jay	x 2 calling in trees	SP

Date	Survey	Species	Notes	Surveyor
06/10/2022	Vantage Point Survey, VP7	Linnet	x 5 flying se	SP
06/10/2022	Vantage Point Survey, VP7	Pied Wagtail	x 1 flying NW	SP
06/10/2022	Vantage Point Survey, VP7	Reed Bunting	x 4	SP
06/10/2022	Vantage Point Survey, VP7	Goldfinch	x 2 flying w	SP
06/10/2022	Vantage Point Survey, VP7	Raven	x 2 flying s 12.35	SP
10/10/2022	Winter Walkover Survey, T1	Magpie		NM
10/10/2022	Winter Walkover Survey, T1	Blackbird		NM
10/10/2022	Winter Walkover Survey, T1	Wren		NM
10/10/2022	Winter Walkover Survey, T1	Robin		NM
10/10/2022	Winter Walkover Survey, T1	Barn Swallow		NM
10/10/2022	Winter Walkover Survey, T1	Raven		NM
10/10/2022	Winter Walkover Survey, T1	Stonechat		NM
10/10/2022	Winter Walkover Survey, T1	Long-tailed Tit		NM
10/10/2022	Winter Walkover Survey, T1	Goldfinch		NM
10/10/2022	Winter Walkover Survey, T3	Hooded Crow		NM
10/10/2022	Winter Walkover Survey, T3	Rook		NM
10/10/2022	Winter Walkover Survey, T3	Barn Swallow		NM
10/10/2022	Winter Walkover Survey, T3	Raven		NM
11/10/2022	Winter Walkover Survey, T2	Blackbird		NM
11/10/2022	Winter Walkover Survey, T2	Raven		NM
11/10/2022	Winter Walkover Survey, T2	Jay		NM
11/10/2022	Winter Walkover Survey, T2	Song Thrush		NM
11/10/2022	Winter Walkover Survey, T2	Long-tailed Tit		NM
11/10/2022	Winter Walkover Survey, T2	Stonechat		NM
11/10/2022	Winter Walkover Survey, T4	Woodpigeon		NM
11/10/2022	Winter Walkover Survey, T4	Goldfinch		NM
11/10/2022	Winter Walkover Survey, T4	Song Thrush		NM
11/10/2022	Winter Walkover Survey, T4	Raven		NM
11/10/2022	Vantage Point Survey, VP13	Rook		MW
11/10/2022	Vantage Point Survey, VP13	Raven		MW
11/10/2022	Vantage Point Survey, VP13	Skylark		MW
11/10/2022	Vantage Point Survey, VP13	Linnet		MW
11/10/2022	Vantage Point Survey, VP13	Pied Wagtail		MW
11/10/2022	Vantage Point Survey, VP13	Hooded Crow		MW
11/10/2022	Vantage Point Survey, VP13	Magpie		MW
11/10/2022	Vantage Point Survey, VP13	Blackbird		MW
11/10/2022	Vantage Point Survey, VP13	Robin		MW
11/10/2022	Vantage Point Survey, VP13	Wren		MW
11/10/2022	Vantage Point Survey, VP13	Stonechat		MW
11/10/2022	Vantage Point Survey, VP13	Lesser Redpoll		MW
12/10/2022	Vantage Point Survey, VP8	Blackbird	0706 alarm call	SP
12/10/2022	Vantage Point Survey, VP8	Robin	singing	SP
12/10/2022	Vantage Point Survey, VP8	Wren	calling	SP
12/10/2022	Vantage Point Survey, VP8	Dunnoek	x 3 calling	SP
12/10/2022	Vantage Point Survey, VP8	Goldcrest	calling	SP

Date	Survey	Species	Notes	Surveyor
12/10/2022	Vantage Point Survey, VP8	Common Redpoll	x 5 flying NW	SP
12/10/2022	Vantage Point Survey, VP8	Chaffinch	x 2 flying N	SP
12/10/2022	Vantage Point Survey, VP8	Reed Bunting	calling	SP
12/10/2022	Vantage Point Survey, VP8	Blue Tit	x 3 calling	SP
12/10/2022	Vantage Point Survey, VP8	Raven	x 2 flying S	SP
12/10/2022	Vantage Point Survey, VP8	Hooded Crow	x 1 flying N	SP
12/10/2022	Vantage Point Survey, VP8	Long-tailed Tit	x 5 s of VP	SP
12/10/2022	Vantage Point Survey, VP8	Common Redpoll	x 5 flying SW	SP
12/10/2022	Vantage Point Survey, VP8	Linnet	x 1 flying SW	SP
12/10/2022	Vantage Point Survey, VP8	Goldfinch	x 4 flying SW	SP
12/10/2022	Vantage Point Survey, VP8	Skylark	x 1 flying NW	SP
12/10/2022	Vantage Point Survey, VP8	Raven	x 3 flying S	SP
12/10/2022	Vantage Point Survey, VP8	Jay	x 2 calling S of VP	SP
12/10/2022	Vantage Point Survey, VP8	Raven	x 1 flying S	SP
12/10/2022	Vantage Point Survey, VP8	Siskin	x 2 flying W	SP
12/10/2022	Vantage Point Survey, VP8	Stonechat	x 2 s of VP	SP
12/10/2022	Vantage Point Survey, VP8	Skylark	x 1 flying S	SP
12/10/2022	Vantage Point Survey, VP8	Linnet	x 3 flying W	SP
12/10/2022	Vantage Point Survey, VP8	Common Redpoll	x 2 flying N	SP
12/10/2022	Vantage Point Survey, VP8	Long-tailed Tit	x 17 roving flock	SP
12/10/2022	Vantage Point Survey, VP8	Starling	x 2 flying W	SP
12/10/2022	Vantage Point Survey, VP8	Bullfinch	x 2 calling 12:36	SP
14/10/2022	Vantage Point Survey, VP14	Raven		MW
14/10/2022	Vantage Point Survey, VP14	Skylark		MW
14/10/2022	Vantage Point Survey, VP14	Linnet		MW
14/10/2022	Vantage Point Survey, VP14	Hooded Crow		MW
14/10/2022	Vantage Point Survey, VP14	Blackbird		MW
14/10/2022	Vantage Point Survey, VP14	Robin		MW
14/10/2022	Vantage Point Survey, VP14	Stonechat		MW
14/10/2022	Vantage Point Survey, VP14	Mistle Thrush		MW
14/10/2022	Vantage Point Survey, VP14	Wren		MW
14/10/2022	Vantage Point Survey, VP14	Magpie		MW
14/10/2022	Vantage Point Survey, VP14	Woodpigeon		MW
14/10/2022	Vantage Point Survey, VP14	Pheasant		MW
14/10/2022	Vantage Point Survey, VP14	Long-tailed Tit		MW
14/10/2022	Vantage Point Survey, VP14	Jay		MW
25/10/2022	Vantage Point Survey, VP15	Stonechat		KS
25/10/2022	Vantage Point Survey, VP15	Skylark		KS
25/10/2022	Vantage Point Survey, VP15	Chaffinch		KS
25/10/2022	Vantage Point Survey, VP15	Lesser Redpoll		KS
25/10/2022	Vantage Point Survey, VP15	Pied Wagtail		KS
25/10/2022	Vantage Point Survey, VP15	Reed Bunting		KS
25/10/2022	Vantage Point Survey, VP15	Pheasant		KS
25/10/2022	Vantage Point Survey, VP15	Raven		KS

Date	Survey	Species	Notes	Surveyor
25/10/2022	Vantage Point Survey, VP15	Hooded Crow		KS
25/10/2022	Vantage Point Survey, VP15	Rook		KS
25/10/2022	Vantage Point Survey, VP15	Woodpigeon		KS
25/10/2022	Vantage Point Survey, VP15	Long-tailed Tit		KS
25/10/2022	Vantage Point Survey, VP15	Blue Tit		KS
25/10/2022	Vantage Point Survey, VP15	Mistle Thrush		KS
25/10/2022	Vantage Point Survey, VP15	Wren		KS
25/10/2022	Vantage Point Survey, VP15	Blackbird		KS
27/10/2022	Vantage Point Survey, VP11	Wren		EF
27/10/2022	Vantage Point Survey, VP11	Robin		EF
27/10/2022	Vantage Point Survey, VP11	Rook		EF
27/10/2022	Vantage Point Survey, VP11	Woodpigeon		EF
27/10/2022	Vantage Point Survey, VP11	Hooded Crow		EF
27/10/2022	Vantage Point Survey, VP11	Pied Wagtail		EF
27/10/2022	Vantage Point Survey, VP11	Pheasant		EF
27/10/2022	Vantage Point Survey, VP11	Starling		EF
27/10/2022	Vantage Point Survey, VP11	Magpie		EF
27/10/2022	Vantage Point Survey, VP11	Raven		EF
27/10/2022	Vantage Point Survey, VP11	Lesser Redpoll		EF
27/10/2022	Vantage Point Survey, VP11	Dunnoek		EF
27/10/2022	Vantage Point Survey, VP11	Reed Bunting		EF
02/11/2022	Vantage Point Survey, VP16	Pheasant		KS
02/11/2022	Vantage Point Survey, VP16	Woodpigeon		KS
02/11/2022	Vantage Point Survey, VP16	Hooded Crow		KS
02/11/2022	Vantage Point Survey, VP16	Raven		KS
02/11/2022	Vantage Point Survey, VP16	Jay		KS
02/11/2022	Vantage Point Survey, VP16	Mistle Thrush		KS
02/11/2022	Vantage Point Survey, VP16	Fieldfare		KS
02/11/2022	Vantage Point Survey, VP16	Stonechat		KS
02/11/2022	Vantage Point Survey, VP16	Blackbird		KS
02/11/2022	Vantage Point Survey, VP16	Wren		KS
02/11/2022	Vantage Point Survey, VP16	Chaffinch		KS
02/11/2022	Vantage Point Survey, VP16	Robin		KS
02/11/2022	Vantage Point Survey, VP16	Linnet		KS
03/11/2022	Vantage Point Survey, VP12	Starling		MW
03/11/2022	Vantage Point Survey, VP12	Rook		MW
03/11/2022	Vantage Point Survey, VP12	Raven		MW
03/11/2022	Vantage Point Survey, VP12	Hooded Crow		MW
03/11/2022	Vantage Point Survey, VP12	Stonechat		MW
03/11/2022	Vantage Point Survey, VP12	Chaffinch		MW
03/11/2022	Vantage Point Survey, VP12	Magpie		MW
03/11/2022	Vantage Point Survey, VP12	Great Tit		MW
03/11/2022	Vantage Point Survey, VP12	Blackbird		MW
03/11/2022	Vantage Point Survey, VP12	Robin		MW
03/11/2022	Vantage Point Survey, VP12	Wren		MW
03/11/2022	Vantage Point Survey, VP12	Skylark		MW

Date	Survey	Species	Notes	Surveyor
03/11/2022	Vantage Point Survey, VP12	Woodpigeon		MW
03/11/2022	Vantage Point Survey, VP12	Linnet		MW
03/11/2022	Vantage Point Survey, VP9	Woodpigeon	calling 0645	SP
03/11/2022	Vantage Point Survey, VP9	Robin	calling	SP
03/11/2022	Vantage Point Survey, VP9	Wren	calling	SP
03/11/2022	Vantage Point Survey, VP9	Blackbird	calling	SP
03/11/2022	Vantage Point Survey, VP9	Fieldfare	x 2 heard flying w	SP
03/11/2022	Vantage Point Survey, VP9	Reed Bunting	calling near vp9	SP
03/11/2022	Vantage Point Survey, VP9	Pied Wagtail	x 2 S over VP	SP
03/11/2022	Vantage Point Survey, VP9	Pheasant	1 calling S of VP	SP
03/11/2022	Vantage Point Survey, VP9	Common Redpoll	x 2 flying n	SP
03/11/2022	Vantage Point Survey, VP9	Skylark	x 1 flying e	SP
03/11/2022	Vantage Point Survey, VP9	Linnet	x 6 flying s	SP
03/11/2022	Vantage Point Survey, VP9	Jay	2 heard e of VP	SP
03/11/2022	Vantage Point Survey, VP9	Jay	x 1 flying s 10:42	SP
03/11/2022	Vantage Point Survey, VP9	Jay	x 1 flying n 10:55	SP
03/11/2022	Vantage Point Survey, VP9	Pied Wagtail	x 1 flying s	SP
03/11/2022	Vantage Point Survey, VP9	Skylark	x 2 flying e	SP
03/11/2022	Vantage Point Survey, VP9	Stonechat	1 male e of VP	SP
03/11/2022	Vantage Point Survey, VP9	Crossbill	x 30 flying n	SP
03/11/2022	Vantage Point Survey, VP9	Skylark	x 2 flying e	SP
03/11/2022	Vantage Point Survey, VP9	Jay	x 1 moving n	SP
03/11/2022	Vantage Point Survey, VP9	Skylark	x 1 flying e	SP
03/11/2022	Vantage Point Survey, VP9	Pied Wagtail	x 1 flying s	SP
03/11/2022	Vantage Point Survey, VP9	Long-tailed Tit	x 15 roving flock	SP
03/11/2022	Vantage Point Survey, VP9	Hooded Crow	x 3 flying s	SP
03/11/2022	Vantage Point Survey, VP9	Linnet	x 3 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Woodpigeon	x 25 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Siskin	x 3 flying E	SP
03/11/2022	Vantage Point Survey, VP9	Chaffinch	x 4 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Woodpigeon	x 350 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Linnet	x 2 flying S	SP
03/11/2022	Vantage Point Survey, VP9	Bullfinch	x 2 flying NW	SP
03/11/2022	Vantage Point Survey, VP9	Woodpigeon	x 150 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Jay	2 calling n of VP	SP
03/11/2022	Vantage Point Survey, VP9	Rook	x 6 flying s	SP
03/11/2022	Vantage Point Survey, VP9	Woodpigeon	x 125 flying SW	SP
03/11/2022	Vantage Point Survey, VP9	Reed Bunting	x 2 n over VP	SP
03/11/2022	Vantage Point Survey, VP9	Starling	x 3 flying NW	SP
03/11/2022	Vantage Point Survey, VP9	Skylark	x 2 flying W	SP
03/11/2022	Vantage Point Survey, VP9	Stonechat	female W of VP	SP
07/11/2022	Vantage Point Survey, VP14	Rook		MW
07/11/2022	Vantage Point Survey, VP14	Raven		MW
07/11/2022	Vantage Point Survey, VP14	Hooded Crow		MW
07/11/2022	Vantage Point Survey, VP14	Lesser Redpoll		MW

Date	Survey	Species	Notes	Surveyor
07/11/2022	Vantage Point Survey, VP14	Woodpigeon		MW
07/11/2022	Vantage Point Survey, VP14	Starling		MW
07/11/2022	Vantage Point Survey, VP14	Mistle Thrush		MW
07/11/2022	Vantage Point Survey, VP14	Fieldfare		MW
08/11/2022	Vantage Point Survey, VP13	Lesser Redpoll		MW
08/11/2022	Vantage Point Survey, VP13	Wren		MW
08/11/2022	Vantage Point Survey, VP13	Pied Wagtail		MW
08/11/2022	Vantage Point Survey, VP13	Blackbird		MW
08/11/2022	Vantage Point Survey, VP13	Fieldfare		MW
08/11/2022	Vantage Point Survey, VP1	Jay	calling in trees S of VP	SP
08/11/2022	Vantage Point Survey, VP1	Skylark	flying n	SP
08/11/2022	Vantage Point Survey, VP1	Common Redpoll	7 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Raven	1 flying n	SP
08/11/2022	Vantage Point Survey, VP1	Skylark	x 1 flying n	SP
08/11/2022	Vantage Point Survey, VP1	Rook	x 25 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Raven	x 1 flying SW	SP
08/11/2022	Vantage Point Survey, VP1	Bullfinch	x 2 flying SW 12:40	SP
08/11/2022	Vantage Point Survey, VP1	Raven	x 4 flying SW	SP
08/11/2022	Vantage Point Survey, VP1	Linnet	x 10 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Stonechat	x 2 w of VP	SP
08/11/2022	Vantage Point Survey, VP1	Hooded Crow	x 2 flying w	SP
08/11/2022	Vantage Point Survey, VP1	Jay	x 2 calling in trees N of VP	SP
08/11/2022	Vantage Point Survey, VP1	Woodpigeon	x 3 flying n	SP
08/11/2022	Vantage Point Survey, VP1	Fieldfare	x1 flying e	SP
08/11/2022	Vantage Point Survey, VP1	Raven	x 1 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Mistle Thrush	1 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Rook	x 25 flying w	SP
08/11/2022	Vantage Point Survey, VP1	Woodpigeon	x 5 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Raven	1 flying w 14:37	SP
08/11/2022	Vantage Point Survey, VP1	Woodpigeon	x 25 flying NW	SP
08/11/2022	Vantage Point Survey, VP1	Chaffinch	x 2 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Hooded Crow	x 2 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Fieldfare	x 35 flying s into trees w of VP	SP
08/11/2022	Vantage Point Survey, VP1	Reed Bunting	1 heard calling w of VP	SP
08/11/2022	Vantage Point Survey, VP1	Woodpigeon	x 12 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Pied Wagtail	x1 flying n	SP
08/11/2022	Vantage Point Survey, VP1	Goldcrest	heard calling s of VP	SP
08/11/2022	Vantage Point Survey, VP1	Chaffinch	x 2 flying s	SP
08/11/2022	Vantage Point Survey, VP1	Blackbird	5 calling at dusk 17:14	SP
09/11/2022	Vantage Point Survey, VP2	Skylark	1 flying n	SP
09/11/2022	Vantage Point Survey, VP2	Goldfinch	1 flying NW	SP
09/11/2022	Vantage Point Survey, VP2	Woodpigeon	3 flying ne	SP
09/11/2022	Vantage Point Survey, VP2	Starling	10 flying w	SP
09/11/2022	Vantage Point Survey, VP2	Skylark	2 flying w	SP
09/11/2022	Vantage Point Survey, VP2	Mistle Thrush	2 flying w	SP

Date	Survey	Species	Notes	Surveyor
09/11/2022	Vantage Point Survey, VP2	Jay	1 flying NW	SP
09/11/2022	Vantage Point Survey, VP2	Woodpigeon	2 flying n	SP
09/11/2022	Vantage Point Survey, VP2	Fieldfare	5 flying s	SP
09/11/2022	Vantage Point Survey, VP2	Starling	50 flying w	SP
09/11/2022	Vantage Point Survey, VP2	Raven	1 flying w 13:44	SP
09/11/2022	Vantage Point Survey, VP2	Hooded Crow	2 flying e	SP
09/11/2022	Vantage Point Survey, VP2	Woodpigeon	50 flying w	SP
09/11/2022	Vantage Point Survey, VP2	Starling	20 flying s	SP
09/11/2022	Vantage Point Survey, VP2	Fieldfare	2 flying e	SP
09/11/2022	Vantage Point Survey, VP2	Starling	10 flying SW	SP
09/11/2022	Vantage Point Survey, VP2	Siskin	2 flying SW	SP
09/11/2022	Vantage Point Survey, VP2	Jay	1 flying s	SP
09/11/2022	Vantage Point Survey, VP2	Mistle Thrush	2 flying n	SP
09/11/2022	Vantage Point Survey, VP2	Hooded Crow	25 flying s 15:36	SP
09/11/2022	Vantage Point Survey, VP2	Woodpigeon	175 flying n 15:52	SP
09/11/2022	Vantage Point Survey, VP2	Fieldfare	4 flying s	SP
09/11/2022	Vantage Point Survey, VP2	Pied Wagtail	1 flying s 16:28	SP
09/11/2022	Vantage Point Survey, VP2	Fieldfare	6 flying s 16:53	SP
15/11/2022	Vantage Point Survey, VP11	Skylark		MW
15/11/2022	Vantage Point Survey, VP11	Linnet		MW
15/11/2022	Vantage Point Survey, VP11	Stonechat		MW
15/11/2022	Vantage Point Survey, VP11	Reed Bunting		MW
15/11/2022	Vantage Point Survey, VP11	Lesser Redpoll		MW
15/11/2022	Vantage Point Survey, VP11	Magpie		MW
15/11/2022	Vantage Point Survey, VP11	Bullfinch		MW
15/11/2022	Vantage Point Survey, VP11	Pied Wagtail		MW
15/11/2022	Vantage Point Survey, VP11	Robin		MW
15/11/2022	Vantage Point Survey, VP11	Wren		MW
15/11/2022	Vantage Point Survey, VP11	Blackbird		MW
15/11/2022	Vantage Point Survey, VP11	Raven		MW
15/11/2022	Vantage Point Survey, VP11	Fieldfare		MW
16/11/2022	Vantage Point Survey, VP9	Wren		MW
16/11/2022	Vantage Point Survey, VP9	Robin		MW
16/11/2022	Vantage Point Survey, VP9	Raven		MW
16/11/2022	Vantage Point Survey, VP9	Hooded Crow		MW
16/11/2022	Vantage Point Survey, VP9	Jay		MW
16/11/2022	Vantage Point Survey, VP9	Mistle Thrush		MW
16/11/2022	Vantage Point Survey, VP9	Bullfinch		MW
16/11/2022	Vantage Point Survey, VP9	Fieldfare		MW
16/11/2022	Vantage Point Survey, VP9	Woodpigeon		MW
17/11/2022	Vantage Point Survey, VP6	Blackbird		NM
17/11/2022	Vantage Point Survey, VP6	Starling		NM
17/11/2022	Vantage Point Survey, VP6	Bullfinch		NM
17/11/2022	Vantage Point Survey, VP6	Hooded Crow		NM
17/11/2022	Vantage Point Survey, VP6	Woodpigeon		NM
17/11/2022	Vantage Point Survey, VP6	Dunnoek		NM

Date	Survey	Species	Notes	Surveyor
17/11/2022	Vantage Point Survey, VP6	House Sparrow		NM
17/11/2022	Vantage Point Survey, VP6	Robin		NM
17/11/2022	Vantage Point Survey, VP6	Stonechat		NM
18/11/2022	Vantage Point Survey, VP4	Raven		NM
18/11/2022	Vantage Point Survey, VP4	Blackbird		NM
18/11/2022	Vantage Point Survey, VP4	Dunnoek		NM
18/11/2022	Vantage Point Survey, VP4	Pied Wagtail		NM
18/11/2022	Vantage Point Survey, VP4	Hooded Crow		NM
18/11/2022	Vantage Point Survey, VP4	Rook		NM
18/11/2022	Vantage Point Survey, VP4	Robin		NM
18/11/2022	Vantage Point Survey, VP4	Stonechat		NM
21/11/2022	Vantage Point Survey, VP10	Lesser Redpoll		MW
21/11/2022	Vantage Point Survey, VP10	Hooded Crow		MW
21/11/2022	Vantage Point Survey, VP10	Wren		MW
21/11/2022	Vantage Point Survey, VP10	Woodpigeon		MW
21/11/2022	Vantage Point Survey, VP10	Blackbird		MW
21/11/2022	Vantage Point Survey, VP10	Long-tailed Tit		MW
21/11/2022	Vantage Point Survey, VP10	Magpie		MW
21/11/2022	Vantage Point Survey, VP10	Jay		MW
22/11/2022	Vantage Point Survey, VP15	Pied Wagtail		EF
22/11/2022	Vantage Point Survey, VP15	Reed Bunting		EF
22/11/2022	Vantage Point Survey, VP15	Robin		EF
22/11/2022	Vantage Point Survey, VP15	Long-tailed Tit		EF
22/11/2022	Vantage Point Survey, VP15	Blue Tit		EF
22/11/2022	Vantage Point Survey, VP15	Wren		EF
22/11/2022	Vantage Point Survey, VP15	Goldcrest		EF
22/11/2022	Vantage Point Survey, VP15	Hooded Crow		EF
22/11/2022	Vantage Point Survey, VP15	Lesser Redpoll		EF
22/11/2022	Vantage Point Survey, VP15	Stonechat		EF
22/11/2022	Vantage Point Survey, VP15	Rook		EF
22/11/2022	Vantage Point Survey, VP15	Woodpigeon		EF
22/11/2022	Vantage Point Survey, VP15	Raven		EF
22/11/2022	Vantage Point Survey, VP15	Blackbird		EF
22/11/2022	Vantage Point Survey, VP7	Hooded Crow		NM
22/11/2022	Vantage Point Survey, VP7	Bullfinch		NM
22/11/2022	Vantage Point Survey, VP7	Stonechat		NM
22/11/2022	Vantage Point Survey, VP7	Mistle Thrush		NM
22/11/2022	Vantage Point Survey, VP7	Magpie		NM
22/11/2022	Vantage Point Survey, VP7	Jay		NM
22/11/2022	Vantage Point Survey, VP7	Fieldfare		NM
23/11/2022	Vantage Point Survey, Vp16	Stonechat		KS
23/11/2022	Vantage Point Survey, Vp16	Skylark		KS
23/11/2022	Vantage Point Survey, Vp16	Fieldfare		KS
23/11/2022	Vantage Point Survey, Vp16	Mistle Thrush		KS
23/11/2022	Vantage Point Survey, Vp16	Robin		KS
23/11/2022	Vantage Point Survey, Vp16	Wren		KS

Date	Survey	Species	Notes	Surveyor
23/11/2022	Vantage Point Survey, Vp16	Blackbird		KS
23/11/2022	Vantage Point Survey, Vp16	Woodpigeon		KS
23/11/2022	Vantage Point Survey, Vp16	Raven		KS
23/11/2022	Vantage Point Survey, Vp16	Magpie		KS
23/11/2022	Vantage Point Survey, Vp16	Rook		KS
23/11/2022	Vantage Point Survey, Vp16	Reed Bunting		KS
23/11/2022	Vantage Point Survey, VP10	Blackbird	0658 alarm calling	SP
23/11/2022	Vantage Point Survey, VP10	Hooded Crow	calling n of VP	SP
23/11/2022	Vantage Point Survey, VP10	Fieldfare	2 heard flying n of VP	SP
23/11/2022	Vantage Point Survey, VP10	Hooded Crow	180 flying s 0714-0752	SP
23/11/2022	Vantage Point Survey, VP10	Reed Bunting	1 calling s of VP	SP
23/11/2022	Vantage Point Survey, VP10	Robin	x 5 calling	SP
23/11/2022	Vantage Point Survey, VP10	Wren	x 4 calling	SP
23/11/2022	Vantage Point Survey, VP10	Common Redpoll	x 2 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Fieldfare	x 2 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Skylark	x 1 flying n	SP
23/11/2022	Vantage Point Survey, VP10	Goldcrest	calling close to VP	SP
23/11/2022	Vantage Point Survey, VP10	Common Redpoll	x 6 flying s	SP
23/11/2022	Vantage Point Survey, VP10	Chaffinch	275 moving s small flocks	SP
23/11/2022	Vantage Point Survey, VP10	Raven	x 2 flying n calling	SP
23/11/2022	Vantage Point Survey, VP10	Fieldfare	x 4 flying s	SP
23/11/2022	Vantage Point Survey, VP10	Woodpigeon	x 45 flying s	SP
23/11/2022	Vantage Point Survey, VP10	Stonechat	x 1 male close to VP	SP
23/11/2022	Vantage Point Survey, VP10	Goldfinch	x 2 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Raven	x 2 flying s	SP
23/11/2022	Vantage Point Survey, VP10	Siskin	x 2 flying SW	SP
23/11/2022	Vantage Point Survey, VP10	Fieldfare	x 10 flying SW	SP
23/11/2022	Vantage Point Survey, VP10	Rook	x 25 flying SW	SP
23/11/2022	Vantage Point Survey, VP10	Woodpigeon	x 60 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Jackdaw	x 50 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Duncock	x 2 calling close to VP	SP
23/11/2022	Vantage Point Survey, VP10	Pied Wagtail	x 2 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Reed Bunting	x 1 flying SW	SP
23/11/2022	Vantage Point Survey, VP10	Fieldfare	x 35 flying n into trees	SP
23/11/2022	Vantage Point Survey, VP10	Woodpigeon	x 150 flying NW	SP
23/11/2022	Vantage Point Survey, VP10	Magpie	x 2	SP
23/11/2022	Vantage Point Survey, VP10	Starling	x 3 flying w 12:59	SP
30/11/2022	Vantage Point Survey, VP3	Wren		MW
30/11/2022	Vantage Point Survey, VP3	Blackbird		MW
30/11/2022	Vantage Point Survey, VP3	Raven		MW
30/11/2022	Vantage Point Survey, VP3	Hooded Crow		MW
30/11/2022	Vantage Point Survey, VP3	Stonechat		MW
30/11/2022	Vantage Point Survey, VP3	Woodpigeon		MW
30/11/2022	Vantage Point Survey, VP3	Magpie		MW
30/11/2022	Vantage Point Survey, VP3	Lesser Redpoll		MW

Date	Survey	Species	Notes	Surveyor
30/11/2022	Vantage Point Survey, VP3	Fieldfare		MW
30/11/2022	Vantage Point Survey, VP3	Mistle Thrush		MW
01/12/2022	Vantage Point Survey, VP5	Hooded Crow		NM
01/12/2022	Vantage Point Survey, VP5	Wren		NM
01/12/2022	Vantage Point Survey, VP5	Robin		NM
01/12/2022	Vantage Point Survey, VP5	Blackbird		NM
01/12/2022	Vantage Point Survey, VP5	Stonechat		NM
01/12/2022	Vantage Point Survey, VP5	Raven		NM
02/12/2022	Vantage Point Survey, VP8	Stonechat		NM
02/12/2022	Vantage Point Survey, VP8	Robin		NM
02/12/2022	Vantage Point Survey, VP8	Woodpigeon		NM
02/12/2022	Vantage Point Survey, VP8	Hooded Crow		NM
02/12/2022	Vantage Point Survey, VP8	Raven		NM
02/12/2022	Vantage Point Survey, VP8	Reed Bunting		NM
02/12/2022	Vantage Point Survey, VP8	Blue Tit		NM
02/12/2022	Vantage Point Survey, VP8	Pheasant		NM
02/12/2022	Vantage Point Survey, VP8	Long-tailed Tit		NM
05/12/2022	Vantage Point Survey, VP11	Robin		KB
05/12/2022	Vantage Point Survey, VP11	Hooded Crow		KB
05/12/2022	Vantage Point Survey, VP11	Starling		KB
05/12/2022	Vantage Point Survey, VP11	Magpie		KB
05/12/2022	Vantage Point Survey, VP11	Stonechat		KB
05/12/2022	Vantage Point Survey, VP11	Blackbird		KB
05/12/2022	Vantage Point Survey, VP11	Jackdaw		KB
05/12/2022	Vantage Point Survey, VP11	Wren		KB
05/12/2022	Vantage Point Survey, VP11	Woodpigeon		KB
05/12/2022	Vantage Point Survey, VP11	Rook		KB
05/12/2022	Vantage Point Survey, VP11	Long-tailed Tit		KB
05/12/2022	Vantage Point Survey, VP11	Lesser Redpoll		KB
05/12/2022	Vantage Point Survey, VP11	Blue Tit		KB
06/12/2022	Vantage Point Survey, VP2	Blackbird	heard calling s of VP 07:37	SP
06/12/2022	Vantage Point Survey, VP2	Robin	07:55 heard calling	SP
06/12/2022	Vantage Point Survey, VP2	Hooded Crow	8 flying n 08:05	SP
06/12/2022	Vantage Point Survey, VP2	Common Redpoll	3 flying s over vp2	SP
06/12/2022	Vantage Point Survey, VP2	Woodpigeon	x 5 flying ne	SP
06/12/2022	Vantage Point Survey, VP2	Fieldfare	x 8 over trees w of vp2	SP
06/12/2022	Vantage Point Survey, VP2	Common Redpoll	x 2 flying e south of VP	SP
06/12/2022	Vantage Point Survey, VP2	Woodpigeon	160 flying SW over trees west of VP 08:49	SP
06/12/2022	Vantage Point Survey, VP2	Raven	x 2 NW of VP flying south	SP
06/12/2022	Vantage Point Survey, VP2	Woodpigeon	x 90 flying se over trees west of vp2	SP
06/12/2022	Vantage Point Survey, VP2	Jay	flying n west of VP	SP
06/12/2022	Vantage Point Survey, VP2	Raven	x1 flying n over VP	SP
06/12/2022	Vantage Point Survey, VP2	Mistle Thrush	x 1 flying e over VP	SP

Date	Survey	Species	Notes	Surveyor
06/12/2022	Vantage Point Survey, VP2	Magpie	x 1 flying w over VP	SP
06/12/2022	Vantage Point Survey, VP2	Jay	x 3 flying w over trees south of VP	SP
06/12/2022	Vantage Point Survey, VP2	Common Redpoll	x 8 flying e over VP	SP
06/12/2022	Vantage Point Survey, VP2	Linnet	x 1 flying n over VP	SP
06/12/2022	Vantage Point Survey, VP2	Starling	x 3 flying e	SP
06/12/2022	Vantage Point Survey, VP2	Pheasant	x 2 flying into trees s of VP	SP
06/12/2022	Vantage Point Survey, VP2	Chaffinch	x 50 flying w	SP
06/12/2022	Vantage Point Survey, VP2	Skylark	x 1 flying w over VP	SP
06/12/2022	Vantage Point Survey, VP2	Linnet	x 2 flying E south of VP	SP
06/12/2022	Vantage Point Survey, VP2	Common Redpoll	x 1 flying NW over VP	SP
06/12/2022	Vantage Point Survey, VP2	Goldcrest	x 1 calling s of VP	SP
06/12/2022	Vantage Point Survey, VP2	Stonechat	female w of VP	SP
06/12/2022	Vantage Point Survey, VP2	Stonechat	male NW of VP	SP
07/12/2022	Vantage Point Survey, VP6	Hooded Crow		NM
07/12/2022	Vantage Point Survey, VP6	Rook		NM
07/12/2022	Vantage Point Survey, VP6	Wren		NM
07/12/2022	Vantage Point Survey, VP6	Stonechat		NM
07/12/2022	Vantage Point Survey, VP6	Woodpigeon		NM
08/12/2022	Vantage Point Survey, VP12	Wren		KB
08/12/2022	Vantage Point Survey, VP12	Robin		KB
08/12/2022	Vantage Point Survey, VP12	Blackbird		KB
08/12/2022	Vantage Point Survey, VP12	Woodpigeon		KB
08/12/2022	Vantage Point Survey, VP12	Hooded Crow		KB
08/12/2022	Vantage Point Survey, VP12	Rook		KB
08/12/2022	Vantage Point Survey, VP12	Raven		KB
08/12/2022	Vantage Point Survey, VP12	Stonechat		KB
08/12/2022	Vantage Point Survey, VP12	Goldfinch		KB
18/12/2022	Vantage Point Survey, VP13	Goldfinch		KB
18/12/2022	Vantage Point Survey, VP13	Lesser Redpoll		KB
18/12/2022	Vantage Point Survey, VP13	Song Thrush		KB
18/12/2022	Vantage Point Survey, VP13	Hooded Crow		KB
18/12/2022	Vantage Point Survey, VP13	Raven		KB
18/12/2022	Vantage Point Survey, VP13	Blue Tit		KB
18/12/2022	Vantage Point Survey, VP13	Coal Tit		KB
18/12/2022	Vantage Point Survey, VP13	Dunnock		KB
18/12/2022	Vantage Point Survey, VP13	Jay		KB
18/12/2022	Vantage Point Survey, VP13	Robin		KB
20/12/2022	Vantage Point Survey, VP4	Fieldfare	14 flying east	SP
20/12/2022	Vantage Point Survey, VP4	Fieldfare	2 moving west	SP
20/12/2022	Vantage Point Survey, VP4	Blackbird	2 calling n of VP	SP
20/12/2022	Vantage Point Survey, VP4	Wren	2 calling s of VP	SP
20/12/2022	Vantage Point Survey, VP4	Hooded Crow	1	SP
20/12/2022	Vantage Point Survey, VP4	Reed Bunting	1 male e of VP	SP
20/12/2022	Vantage Point Survey, VP4	Robin	1 singing	SP
20/12/2022	Vantage Point Survey, VP4	Great Tit	1	SP

Date	Survey	Species	Notes	Surveyor
20/12/2022	Vantage Point Survey, VP4	Chaffinch	4 flying s	SP
20/12/2022	Vantage Point Survey, VP4	Hooded Crow	2 flying ne	SP
20/12/2022	Vantage Point Survey, VP4	Raven	1 flying ne	SP
20/12/2022	Vantage Point Survey, VP4	Chaffinch	5 flying n	SP
20/12/2022	Vantage Point Survey, VP4	Common Redpoll	2 flying SW	SP
20/12/2022	Vantage Point Survey, VP4	Rook	1 flying east	SP
20/12/2022	Vantage Point Survey, VP4	Skylark	flying n over VP	SP
20/12/2022	Vantage Point Survey, VP4	Raven	2 flying se	SP
20/12/2022	Vantage Point Survey, VP4	Raven	12:13 2 flying s	SP
20/12/2022	Vantage Point Survey, VP4	Chaffinch	2 flying s	SP
29/12/2022	Vantage Point Survey, VP16	Hooded Crow		EF
29/12/2022	Vantage Point Survey, VP16	Blackbird		EF
29/12/2022	Vantage Point Survey, VP16	Wren		EF
29/12/2022	Vantage Point Survey, VP16	Raven		EF
29/12/2022	Vantage Point Survey, VP16	Reed Bunting		EF
29/12/2022	Vantage Point Survey, VP16	Woodpigeon		EF
29/12/2022	Vantage Point Survey, VP16	Blue Tit		EF
29/12/2022	Vantage Point Survey, VP16	Fieldfare		EF
29/12/2022	Vantage Point Survey, VP16	Dunnock		EF
03/01/2023	Vantage Point Survey, VP14	Woodpigeon		KB
03/01/2023	Vantage Point Survey, VP14	Blackbird		KB
03/01/2023	Vantage Point Survey, VP14	Robin		KB
03/01/2023	Vantage Point Survey, VP14	Wren		KB
03/01/2023	Vantage Point Survey, VP14	Raven		KB
03/01/2023	Vantage Point Survey, VP14	Hooded Crow		KB
03/01/2023	Vantage Point Survey, VP14	Jay		KB
06/01/2023	Vantage Point Survey, VP5	Song Thrush	calling	SP
06/01/2023	Vantage Point Survey, VP5	Wren	calling	SP
06/01/2023	Vantage Point Survey, VP5	Dunnock	calling	SP
06/01/2023	Vantage Point Survey, VP5	Hooded Crow	2	SP
06/01/2023	Vantage Point Survey, VP5	Fieldfare	2 flying NW calling	SP
06/01/2023	Vantage Point Survey, VP5	Starling	30 flying s	SP
06/01/2023	Vantage Point Survey, VP5	Coal Tit	1	SP
06/01/2023	Vantage Point Survey, VP5	Bullfinch	2	SP
06/01/2023	Vantage Point Survey, VP5	Long-tailed Tit	5	SP
06/01/2023	Vantage Point Survey, VP5	Raven	1 flying s	SP
06/01/2023	Vantage Point Survey, VP5	Woodpigeon	2 flying s	SP
06/01/2023	Vantage Point Survey, VP5	Long-tailed Tit	15 roving flock	SP
06/01/2023	Vantage Point Survey, VP5	Great Tit	5	SP
06/01/2023	Vantage Point Survey, VP5	Goldcrest	2	SP
06/01/2023	Vantage Point Survey, VP5	Bullfinch	2	SP
06/01/2023	Vantage Point Survey, VP5	Reed Bunting	1	SP
06/01/2023	Vantage Point Survey, VP5	Hooded Crow	3 flying east	SP
06/01/2023	Vantage Point Survey, VP5	Bullfinch	2 west of vp5	SP
06/01/2023	Vantage Point Survey, VP5	Linnet	2 flying NW	SP

Date	Survey	Species	Notes	Surveyor
06/01/2023	Vantage Point Survey, VP5	Hooded Crow	6 flying east over vp5	SP
06/01/2023	Vantage Point Survey, VP5	Magpie	1 flying west	SP
09/01/2023	Vantage Point Survey, VP7	Chaffinch	2 west of vp7	SP
09/01/2023	Vantage Point Survey, VP7	Woodpigeon	1 flying SW	SP
09/01/2023	Vantage Point Survey, VP7	Common Redpoll	2 flying s	SP
09/01/2023	Vantage Point Survey, VP7	Raven	1 flying s over vp7	SP
09/01/2023	Vantage Point Survey, VP7	Woodpigeon	1 flying se	SP
09/01/2023	Vantage Point Survey, VP7	Raven	1 flying se 15:17	SP
09/01/2023	Vantage Point Survey, VP7	Raven	1 flying NW 16:01	SP
09/01/2023	Vantage Point Survey, VP7	Hooded Crow	5 flying se	SP
09/01/2023	Vantage Point Survey, VP7	Wren	calling 16:31	SP
09/01/2023	Vantage Point Survey, VP7	Fieldfare	2 flying ne	SP
09/01/2023	Vantage Point Survey, VP7	Goldcrest	2 calling 16:41	SP
11/01/2023	Vantage Point Survey, VP15	Starling		KB
11/01/2023	Vantage Point Survey, VP15	Reed Bunting		KB
11/01/2023	Vantage Point Survey, VP15	Blackbird		KB
11/01/2023	Vantage Point Survey, VP15	Lesser Redpoll		KB
11/01/2023	Vantage Point Survey, VP15	Great Tit		KB
11/01/2023	Vantage Point Survey, VP15	Blue Tit		KB
11/01/2023	Vantage Point Survey, VP15	Raven		KB
11/01/2023	Vantage Point Survey, VP15	Hooded Crow		KB
11/01/2023	Vantage Point Survey, VP15	Woodpigeon		KB
11/01/2023	Vantage Point Survey, VP6	Linnet		KS
11/01/2023	Vantage Point Survey, VP6	Lesser Redpoll		KS
11/01/2023	Vantage Point Survey, VP6	Long-tailed Tit		KS
11/01/2023	Vantage Point Survey, VP6	Robin		KS
11/01/2023	Vantage Point Survey, VP6	Wren		KS
11/01/2023	Vantage Point Survey, VP6	Chaffinch		KS
11/01/2023	Vantage Point Survey, VP6	Goldfinch		KS
11/01/2023	Vantage Point Survey, VP6	Hooded Crow		KS
11/01/2023	Vantage Point Survey, VP6	Raven		KS
11/01/2023	Vantage Point Survey, VP6	Woodpigeon		KS
11/01/2023	Vantage Point Survey, VP6	Reed Bunting		KS
11/01/2023	Vantage Point Survey, VP6	Mistle Thrush		KS
11/01/2023	Vantage Point Survey, VP6	Blackbird		KS
11/01/2023	Vantage Point Survey, VP6	Song Thrush		KS
11/01/2023	Vantage Point Survey, VP6	Fieldfare		KS
16/01/2023	Vantage Point Survey, VP2	Woodpigeon		EOB
16/01/2023	Vantage Point Survey, VP2	Goldfinch		EOB
16/01/2023	Vantage Point Survey, VP2	Chaffinch		EOB
16/01/2023	Vantage Point Survey, VP2	Blackbird		EOB
16/01/2023	Vantage Point Survey, VP2	Wren		EOB
16/01/2023	Vantage Point Survey, VP2	Fieldfare		EOB
16/01/2023	Vantage Point Survey, VP2	Rook		EOB
16/01/2023	Vantage Point Survey, VP2	Bullfinch		EOB

Date	Survey	Species	Notes	Surveyor
16/01/2023	Vantage Point Survey, VP2	Hooded Crow		EOB
16/01/2023	Vantage Point Survey, VP2	Coal Tit		EOB
16/01/2023	Vantage Point Survey, VP2	Blue Tit		EOB
16/01/2023	Vantage Point Survey, VP2	Linnet		EOB
16/01/2023	Vantage Point Survey, VP2	Raven		EOB
16/01/2023	Vantage Point Survey, VP2	Magpie		EOB
16/01/2023	Vantage Point Survey, VP2	Great Tit		EOB
16/01/2023	Vantage Point Survey, VP2	Starling		EOB
17/01/2023	Vantage Point Survey, VP3	Wren		EOB
17/01/2023	Vantage Point Survey, VP3	Goldcrest		EOB
17/01/2023	Vantage Point Survey, VP3	Rook		EOB
17/01/2023	Vantage Point Survey, VP3	Linnet		EOB
17/01/2023	Vantage Point Survey, VP3	Woodpigeon		EOB
17/01/2023	Vantage Point Survey, VP3	Jackdaw		EOB
17/01/2023	Vantage Point Survey, VP3	Goldfinch		EOB
17/01/2023	Vantage Point Survey, VP3	Hooded Crow		EOB
17/01/2023	Vantage Point Survey, VP3	Fieldfare		EOB
17/01/2023	Vantage Point Survey, VP3	Raven		EOB
17/01/2023	Vantage Point Survey, VP3	Starling		EOB
20/01/2023	Vantage Point Survey, VP4	Blue Tit		EOB
20/01/2023	Vantage Point Survey, VP4	Lesser Redpoll		EOB
20/01/2023	Vantage Point Survey, VP4	Hooded Crow		EOB
20/01/2023	Vantage Point Survey, VP4	Blackbird		EOB
20/01/2023	Vantage Point Survey, VP4	Wren		EOB
20/01/2023	Vantage Point Survey, VP4	Bullfinch		EOB
20/01/2023	Vantage Point Survey, VP4	Rook		EOB
20/01/2023	Vantage Point Survey, VP4	Jackdaw		EOB
20/01/2023	Vantage Point Survey, VP4	Coal Tit		EOB
20/01/2023	Vantage Point Survey, VP4	Great Tit		EOB
20/01/2023	Vantage Point Survey, VP4	Long-tailed Tit		EOB
20/01/2023	Vantage Point Survey, VP4	Raven		EOB
20/01/2023	Vantage Point Survey, VP4	Dunnock		EOB
20/01/2023	Vantage Point Survey, VP4	Woodpigeon		EOB
20/01/2023	Vantage Point Survey, VP4	Robin		EOB
20/01/2023	Vantage Point Survey, VP4	Magpie		EOB
20/01/2023	Vantage Point Survey, VP4	Starling		EOB
20/01/2023	Vantage Point Survey, VP4	Fieldfare		EOB
21/01/2023	Breeding Walkover Survey, T3	Cuckoo		FLM
21/01/2023	Breeding Walkover Survey, T3	Goldfinch		FLM
21/01/2023	Breeding Walkover Survey, T3	Garden Warbler		FLM
21/01/2023	Breeding Walkover Survey, T3	Wren		FLM
21/01/2023	Breeding Walkover Survey, T3	Willow Warbler		FLM

Date	Survey	Species	Notes	Surveyor
21/01/2023	Breeding Walkover Survey, T3	Goldcrest		FLM
21/01/2023	Breeding Walkover Survey, T3	Dunnock		FLM
21/01/2023	Breeding Walkover Survey, T3	Pied Wagtail		FLM
21/01/2023	Breeding Walkover Survey, T3	Chiffchaff		FLM
21/01/2023	Breeding Walkover Survey, T3	Raven		FLM
21/01/2023	Breeding Walkover Survey, T3	Chaffinch		FLM
21/01/2023	Breeding Walkover Survey, T3	Jackdaw		FLM
21/01/2023	Breeding Walkover Survey, T3	Barn Swallow		FLM
21/01/2023	Breeding Walkover Survey, T3	Sand Martin		FLM
21/01/2023	Breeding Walkover Survey, T3	Blackbird		FLM
21/01/2023	Breeding Walkover Survey, T3	Song Thrush		FLM
23/01/2023	Vantage Point Survey, VP5	Bullfinch		EOB
23/01/2023	Vantage Point Survey, VP5	Blackbird		EOB
23/01/2023	Vantage Point Survey, VP5	Wren		EOB
23/01/2023	Vantage Point Survey, VP5	Magpie		EOB
23/01/2023	Vantage Point Survey, VP5	Chaffinch		EOB
23/01/2023	Vantage Point Survey, VP5	Dunnock		EOB
23/01/2023	Vantage Point Survey, VP5	Robin		EOB
23/01/2023	Vantage Point Survey, VP5	Blue Tit		EOB
23/01/2023	Vantage Point Survey, VP5	Hooded Crow		EOB
23/01/2023	Vantage Point Survey, VP5	Rook		EOB
23/01/2023	Vantage Point Survey, VP5	Jackdaw		EOB
23/01/2023	Vantage Point Survey, VP5	Raven		EOB
23/01/2023	Vantage Point Survey, VP5	Linnet		EOB
23/01/2023	Vantage Point Survey, VP5	Coal Tit		EOB
23/01/2023	Vantage Point Survey, VP5	Lesser Redpoll		EOB
23/01/2023	Vantage Point Survey, VP5	Reed Bunting		EOB
23/01/2023	Vantage Point Survey, VP5	Fieldfare		EOB
23/01/2023	Vantage Point Survey, VP5	Long-tailed Tit		EOB
23/01/2023	Vantage Point Survey, VP5	Song Thrush		EOB
26/01/2023	Vantage Point Survey, VP1	Blackbird		EOB
26/01/2023	Vantage Point Survey, VP1	Chaffinch		EOB
26/01/2023	Vantage Point Survey, VP1	Wren		EOB
26/01/2023	Vantage Point Survey, VP1	Woodpigeon		EOB
26/01/2023	Vantage Point Survey, VP1	Bullfinch		EOB
26/01/2023	Vantage Point Survey, VP1	Hooded Crow		EOB
26/01/2023	Vantage Point Survey, VP1	Jay		EOB
26/01/2023	Vantage Point Survey, VP1	Goldfinch		EOB
26/01/2023	Vantage Point Survey, VP1	Blue Tit		EOB
26/01/2023	Vantage Point Survey, VP1	Fieldfare		EOB



Date	Survey	Species	Notes	Surveyor
26/01/2023	Vantage Point Survey, VP1	Magpie		EOB
26/01/2023	Vantage Point Survey, VP1	Jackdaw		EOB
26/01/2023	Vantage Point Survey, VP1	Rook		EOB
26/01/2023	Vantage Point Survey, VP1	Pheasant		EOB
26/01/2023	Vantage Point Survey, VP1	Linnet		EOB
26/01/2023	Vantage Point Survey, VP1	Long-tailed Tit		EOB
26/01/2023	Vantage Point Survey, VP1	Coal Tit		EOB
26/01/2023	Vantage Point Survey, VP1	Raven		EOB
26/01/2023	Vantage Point Survey, VP1	Lesser Redpoll		EOB
26/01/2023	Vantage Point Survey, VP1	Mistle Thrush		EOB
26/01/2023	Vantage Point Survey, VP16	Hooded Crow		EF
26/01/2023	Vantage Point Survey, VP16	Reed Bunting		EF
26/01/2023	Vantage Point Survey, VP16	Mistle Thrush		EF
26/01/2023	Vantage Point Survey, VP16	Blackbird		EF
26/01/2023	Vantage Point Survey, VP16	Wren		EF
26/01/2023	Vantage Point Survey, VP16	Raven		EF
26/01/2023	Vantage Point Survey, VP16	Woodpigeon		EF
26/01/2023	Vantage Point Survey, VP16	Starling		EF
26/01/2023	Vantage Point Survey, VP8	Reed Bunting	1 female calling	SP
26/01/2023	Vantage Point Survey, VP8	Chaffinch	5 flying south over VP	SP
26/01/2023	Vantage Point Survey, VP8	Reed Bunting	2 calling n of VP	SP
26/01/2023	Vantage Point Survey, VP8	Siskin	1 flying n	SP
26/01/2023	Vantage Point Survey, VP8	Blackbird	alarm calling	SP
26/01/2023	Vantage Point Survey, VP8	Hooded Crow	1 SW of VP	SP
26/01/2023	Vantage Point Survey, VP8	Common Redpoll	3 flying n over VP	SP
26/01/2023	Vantage Point Survey, VP8	Linnet	2 flying w over VP	SP
26/01/2023	Vantage Point Survey, VP8	Great Tit	2 roving flock	SP
26/01/2023	Vantage Point Survey, VP8	Chaffinch	2 roving flock	SP
26/01/2023	Vantage Point Survey, VP8	Dunnock	1 roving flock	SP
26/01/2023	Vantage Point Survey, VP8	Reed Bunting	3 roving flock s of VP	SP
26/01/2023	Vantage Point Survey, VP8	Great Tit	2 15:19 moving SW	SP
26/01/2023	Vantage Point Survey, VP8	Starling	15 flying NW 16:09	SP
26/01/2023	Vantage Point Survey, VP8	Starling	15 flying NW 16:17	SP
26/01/2023	Vantage Point Survey, VP8	Chaffinch	3 flying NW	SP
26/01/2023	Vantage Point Survey, VP8	Blackbird	5 calling at dusk 17:25	SP
31/01/2023	Vantage Point Survey, VP9	Robin	calling	SP
31/01/2023	Vantage Point Survey, VP9	Common Redpoll	2 flying e	SP
31/01/2023	Vantage Point Survey, VP9	Starling	5 flying n	SP
31/01/2023	Vantage Point Survey, VP9	Blackbird	1 calling SW of VP	SP
31/01/2023	Vantage Point Survey, VP9	Common Redpoll	1 flying n	SP
31/01/2023	Vantage Point Survey, VP9	Rook	35 over trees w of VP	SP
31/01/2023	Vantage Point Survey, VP9	Long-tailed Tit	15 roving flock s of VP	SP
31/01/2023	Vantage Point Survey, VP9	Dunnock	1 calling s of VP	SP
31/01/2023	Vantage Point Survey, VP9	Woodpigeon	4 flying SW	SP

Date	Survey	Species	Notes	Surveyor
31/01/2023	Vantage Point Survey, VP9	Raven	1 flying NW 14:42	SP
31/01/2023	Vantage Point Survey, VP9	Starling	4 flying n	SP
31/01/2023	Vantage Point Survey, VP9	Chaffinch	12 flying n over VP	SP
31/01/2023	Vantage Point Survey, VP9	Raven	1 flying SW	SP
31/01/2023	Vantage Point Survey, VP9	Starling	35 flying n	SP
31/01/2023	Vantage Point Survey, VP9	Chaffinch	30 flying NW into trees NW of VP 16:15	SP
31/01/2023	Vantage Point Survey, VP9	Woodpigeon	25 flying ne	SP
31/01/2023	Vantage Point Survey, VP9	Raven	1 flying west 16:27	SP
31/01/2023	Vantage Point Survey, VP9	Chaffinch	35 dropping into trees NW of VP 16:28	SP
31/01/2023	Vantage Point Survey, VP9	Rook	50 roosting flight into trees SW of VP 16:57	SP
31/01/2023	Vantage Point Survey, VP9	Woodpigeon	10 SW of VP into trees	
31/01/2023	Vantage Point Survey, VP9	Fieldfare	10 roosting flight into trees NW of VP 17:06	
31/01/2023	Vantage Point Survey, VP9	Blackbird	3 calling 17:25	
31/01/2023	Vantage Point Survey, VP9	Hooded Crow	2 calling 17:27	
02/02/2023	Vantage Point Survey, VP1	Blackbird		EOB
02/02/2023	Vantage Point Survey, VP1	Song Thrush		EOB
02/02/2023	Vantage Point Survey, VP1	Robin		EOB
02/02/2023	Vantage Point Survey, VP1	Wren		EOB
02/02/2023	Vantage Point Survey, VP1	Raven		EOB
02/02/2023	Vantage Point Survey, VP1	Woodpigeon		EOB
02/02/2023	Vantage Point Survey, VP1	Goldfinch		EOB
02/02/2023	Vantage Point Survey, VP1	Starling		EOB
02/02/2023	Vantage Point Survey, VP1	Linnet		EOB
02/02/2023	Vantage Point Survey, VP1	Chaffinch		EOB
02/02/2023	Vantage Point Survey, VP1	Hooded Crow		EOB
02/02/2023	Vantage Point Survey, VP1	Pied Wagtail		EOB
02/02/2023	Vantage Point Survey, VP1	Bullfinch		EOB
02/02/2023	Vantage Point Survey, VP1	Mistle Thrush		EOB
02/02/2023	Vantage Point Survey, VP1	Lesser Redpoll		EOB
02/02/2023	Vantage Point Survey, VP1	Jackdaw		EOB
02/02/2023	Vantage Point Survey, VP1	Rook		EOB
07/02/2023	Vantage Point Survey, VP2	Robin		EOB
07/02/2023	Vantage Point Survey, VP2	Song Thrush		EOB
07/02/2023	Vantage Point Survey, VP2	Blackbird		EOB
07/02/2023	Vantage Point Survey, VP2	Pheasant		EOB
07/02/2023	Vantage Point Survey, VP2	Wren		EOB
07/02/2023	Vantage Point Survey, VP2	Woodpigeon		EOB
07/02/2023	Vantage Point Survey, VP2	Hooded Crow		EOB
07/02/2023	Vantage Point Survey, VP2	Duncock		EOB
07/02/2023	Vantage Point Survey, VP2	Jackdaw		EOB
07/02/2023	Vantage Point Survey, VP2	Starling		EOB
07/02/2023	Vantage Point Survey, VP2	Fieldfare		EOB
07/02/2023	Vantage Point Survey, VP2	Raven		EOB

Date	Survey	Species	Notes	Surveyor
07/02/2023	Vantage Point Survey, VP2	Goldfinch		EOB
07/02/2023	Vantage Point Survey, VP2	Rook		EOB
07/02/2023	Vantage Point Survey, VP2	Linnet		EOB
07/02/2023	Vantage Point Survey, VP2	Coal Tit		EOB
07/02/2023	Vantage Point Survey, VP2	Long-tailed Tit		EOB
07/02/2023	Vantage Point Survey, VP2	Great Tit		EOB
07/02/2023	Vantage Point Survey, VP2	Lesser Redpoll		EOB
07/02/2023	Vantage Point Survey, VP2	Chaffinch		EOB
07/02/2023	Vantage Point Survey, VP2	Mistle Thrush		EOB
07/02/2023	Vantage Point Survey, VP2	Jay		EOB
07/02/2023	Vantage Point Survey, VP2	Bullfinch		EOB
07/02/2023	Vantage Point Survey, VP2	Magpie		EOB
08/02/2023	Vantage Point Survey, VP3	Stonechat		EOB
08/02/2023	Vantage Point Survey, VP3	Reed Bunting		EOB
08/02/2023	Vantage Point Survey, VP3	Fieldfare		EOB
08/02/2023	Vantage Point Survey, VP3	Magpie		EOB
08/02/2023	Vantage Point Survey, VP3	Robin		EOB
08/02/2023	Vantage Point Survey, VP3	Raven		EOB
08/02/2023	Vantage Point Survey, VP3	Chaffinch		EOB
08/02/2023	Vantage Point Survey, VP3	Lesser Redpoll		EOB
08/02/2023	Vantage Point Survey, VP3	Bullfinch		EOB
08/02/2023	Vantage Point Survey, VP3	Hooded Crow		EOB
08/02/2023	Vantage Point Survey, VP3	Wren		EOB
08/02/2023	Vantage Point Survey, VP3	Song Thrush		EOB
08/02/2023	Vantage Point Survey, VP3	Rook		EOB
08/02/2023	Vantage Point Survey, VP3	Woodpigeon		EOB
08/02/2023	Vantage Point Survey, VP3	Starling		EOB
08/02/2023	Vantage Point Survey, VP3	Jackdaw		EOB
09/02/2023	Vantage Point Survey, VP12	Robin	07:03 singing	SP
09/02/2023	Vantage Point Survey, VP12	Blackbird	singing	SP
09/02/2023	Vantage Point Survey, VP12	Song Thrush	07:08 singing	SP
09/02/2023	Vantage Point Survey, VP12	Collared Dove	calling	SP
09/02/2023	Vantage Point Survey, VP12	Hooded Crow	2 flying w	SP
09/02/2023	Vantage Point Survey, VP12	Starling	50 flying s over VP	SP
09/02/2023	Vantage Point Survey, VP12	Common Redpoll	5 flying s	SP
09/02/2023	Vantage Point Survey, VP12	Woodpigeon	4 flying west	SP
09/02/2023	Vantage Point Survey, VP12	Magpie	2 flying west	SP
09/02/2023	Vantage Point Survey, VP12	Raven	4 flying east	SP
09/02/2023	Vantage Point Survey, VP12	Starling	100 se over VP	SP
09/02/2023	Vantage Point Survey, VP12	Hooded Crow	4 flying west	SP
09/02/2023	Vantage Point Survey, VP12	Rook	20 over trees ne of VP	SP
09/02/2023	Vantage Point Survey, VP12	Raven	3 flying west	SP
09/02/2023	Vantage Point Survey, VP12	Magpie	2 flying south	SP
09/02/2023	Vantage Point Survey, VP12	Coal Tit	1 calling west of VP	SP
09/02/2023	Vantage Point Survey, VP12	Fieldfare	50 flying ne of VP	SP

Date	Survey	Species	Notes	Surveyor
09/02/2023	Vantage Point Survey, VP12	Woodpigeon	50 flying NW	SP
10/02/2023	Vantage Point Survey, VP13	Hooded Crow	2 calling 07:05	SP
10/02/2023	Vantage Point Survey, VP13	Robin	singing se of VP	SP
10/02/2023	Vantage Point Survey, VP13	Song Thrush	singing	SP
10/02/2023	Vantage Point Survey, VP13	Raven	2 flying west	SP
10/02/2023	Vantage Point Survey, VP13	Hooded Crow	1 flying n	SP
10/02/2023	Vantage Point Survey, VP13	Jackdaw	2 flying east	SP
10/02/2023	Vantage Point Survey, VP13	Rook	100 east of VP	SP
10/02/2023	Vantage Point Survey, VP13	Woodpigeon	10 east of VP	SP
13/02/2023	Vantage Point Survey, VP11	Blackbird	singing 07:03	SP
13/02/2023	Vantage Point Survey, VP11	Robin	singing 07:04	SP
13/02/2023	Vantage Point Survey, VP11	Rook	20 flying ne	SP
13/02/2023	Vantage Point Survey, VP11	Hooded Crow	2 flying n	SP
13/02/2023	Vantage Point Survey, VP11	Dunnoek	singing e of VP	SP
13/02/2023	Vantage Point Survey, VP11	Starling	150 flying e 0811	SP
13/02/2023	Vantage Point Survey, VP11	Starling	50 flying e 0820	SP
13/02/2023	Vantage Point Survey, VP11	Reed Bunting	1 male calling e of VP	SP
13/02/2023	Vantage Point Survey, VP11	Raven	2 flying e 08:45	SP
13/02/2023	Vantage Point Survey, VP11	Raven	3 flying se 08:59	SP
13/02/2023	Vantage Point Survey, VP11	Magpie	1 flying east	SP
13/02/2023	Vantage Point Survey, VP11	Skylark	1 flying west	SP
13/02/2023	Vantage Point Survey, VP11	Goldfinch	2 flying west	SP
13/02/2023	Vantage Point Survey, VP11	Linnet	5 flying east over VP	SP
13/02/2023	Vantage Point Survey, VP11	Mistle Thrush	6 flying east calling	SP
13/02/2023	Vantage Point Survey, VP11	Woodpigeon	2 flying n	SP
13/02/2023	Vantage Point Survey, VP11	Pied Wagtail	1 flying west	SP
13/02/2023	Vantage Point Survey, VP11	Hooded Crow	10 flying west	SP
13/02/2023	Vantage Point Survey, VP11	Raven	4 flying SW 13:04	SP
14/02/2023	Vantage Point Survey, HHVP4	Linnet	8 individuals near VP	FLM
14/02/2023	Vantage Point Survey, HHVP4	Reed Bunting	2 near VP	FLM
15/02/2023	Vantage Point Survey, VP4	Robin		EOB
15/02/2023	Vantage Point Survey, VP4	Blackbird		EOB
15/02/2023	Vantage Point Survey, VP4	Song Thrush		EOB
15/02/2023	Vantage Point Survey, VP4	Fieldfare		EOB
15/02/2023	Vantage Point Survey, VP4	Wren		EOB
15/02/2023	Vantage Point Survey, VP4	Dunnoek		EOB
15/02/2023	Vantage Point Survey, VP4	Hooded Crow		EOB
15/02/2023	Vantage Point Survey, VP4	Starling		EOB
15/02/2023	Vantage Point Survey, VP4	Woodpigeon		EOB
15/02/2023	Vantage Point Survey, VP4	Pheasant		EOB
15/02/2023	Vantage Point Survey, VP4	Lesser Redpoll		EOB
15/02/2023	Vantage Point Survey, VP4	Linnet		EOB
15/02/2023	Vantage Point Survey, VP4	Blue Tit		EOB
15/02/2023	Vantage Point Survey, VP4	Jackdaw		EOB
15/02/2023	Vantage Point Survey, VP4	Rook		EOB

Date	Survey	Species	Notes	Surveyor
15/02/2023	Vantage Point Survey, VP4	Chaffinch		EOB
15/02/2023	Vantage Point Survey, VP4	Reed Bunting		EOB
15/02/2023	Vantage Point Survey, VP4	Bullfinch		EOB
15/02/2023	Vantage Point Survey, VP4	Great Tit		EOB
15/02/2023	Vantage Point Survey, VP4	Greenfinch		EOB
15/02/2023	Vantage Point Survey, VP4	Coal Tit		EOB
15/02/2023	Vantage Point Survey, VP4	Raven		EOB
15/02/2023	Vantage Point Survey, VP9	Song Thrush		KB
15/02/2023	Vantage Point Survey, VP9	Woodpigeon		KB
15/02/2023	Vantage Point Survey, VP9	Blackbird		KB
15/02/2023	Vantage Point Survey, VP9	Robin		KB
15/02/2023	Vantage Point Survey, VP9	Wren		KB
15/02/2023	Vantage Point Survey, VP9	Lesser Redpoll		KB
15/02/2023	Vantage Point Survey, VP9	Hooded Crow		KB
15/02/2023	Vantage Point Survey, VP9	Fieldfare		KB
15/02/2023	Vantage Point Survey, VP9	Starling		KB
15/02/2023	Vantage Point Survey, VP9	Great Tit		KB
15/02/2023	Vantage Point Survey, VP9	Mistle Thrush		KB
15/02/2023	Vantage Point Survey, VP9	Jay		KB
15/02/2023	Vantage Point Survey, VP9	Duncock		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Woodpigeon		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Blackbird		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Song Thrush		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Wren		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Robin		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Reed Bunting		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Lesser Redpoll		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Starling		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Hooded Crow		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Blue Tit		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Raven		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Long-tailed Tit		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Goldcrest		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Jay		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Great Tit		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Mistle Thrush		KB

Date	Survey	Species	Notes	Surveyor
16/02/2023	Winter Walkover Survey, T1 and T2	Fieldfare		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Chaffinch		KB
16/02/2023	Winter Walkover Survey, T1 and T2	Stonechat		KB
17/02/2023	Vantage Point Survey, VP8	Song Thrush		KB
17/02/2023	Vantage Point Survey, VP8	Blackbird		KB
17/02/2023	Vantage Point Survey, VP8	Raven		KB
17/02/2023	Vantage Point Survey, VP8	Coal Tit		KB
17/02/2023	Vantage Point Survey, VP8	Robin		KB
17/02/2023	Vantage Point Survey, VP8	Starling		KB
17/02/2023	Vantage Point Survey, VP8	Jay		KB
17/02/2023	Vantage Point Survey, VP8	Great Tit		KB
17/02/2023	Vantage Point Survey, VP8	Dunnock		KB
17/02/2023	Vantage Point Survey, VP8	Chaffinch		KB
17/02/2023	Vantage Point Survey, VP8	Hooded Crow		KB
17/02/2023	Vantage Point Survey, VP8	Mistle Thrush		KB
17/02/2023	Vantage Point Survey, VP15	Blackbird	singing 07:02	SP
17/02/2023	Vantage Point Survey, VP15	Robin	singing 07:02	SP
17/02/2023	Vantage Point Survey, VP15	Wren	singing 07:04	SP
17/02/2023	Vantage Point Survey, VP15	Hooded Crow	1 calling 07:10	SP
17/02/2023	Vantage Point Survey, VP15	Dunnock	singing 07:14	SP
17/02/2023	Vantage Point Survey, VP15	Rook	3 flying SW	SP
17/02/2023	Vantage Point Survey, VP15	Song Thrush	1 singing s of VP	SP
17/02/2023	Vantage Point Survey, VP15	Raven	5 flying east	SP
17/02/2023	Vantage Point Survey, VP15	Rook	25 over trees e of VP	SP
17/02/2023	Vantage Point Survey, VP15	Common Redpoll	2 flying east	SP
17/02/2023	Vantage Point Survey, VP15	Raven	1 flying east 08:01	SP
17/02/2023	Vantage Point Survey, VP15	Common Redpoll	2 flying SW	SP
17/02/2023	Vantage Point Survey, VP15	Woodpigeon	20 over trees e of VP	SP
17/02/2023	Vantage Point Survey, VP15	Rook	45 over trees e of VP	SP
17/02/2023	Vantage Point Survey, VP15	Raven	4 over bog e of VP 08:38	SP
17/02/2023	Vantage Point Survey, VP15	Raven	3 flying west 09:07	SP
17/02/2023	Vantage Point Survey, VP15	Common Redpoll	2 flying n over VP	SP
17/02/2023	Vantage Point Survey, VP15	Raven	2 flying west 09:33	SP
17/02/2023	Vantage Point Survey, VP15	Starling	50 flying south	SP
17/02/2023	Vantage Point Survey, VP15	Woodpigeon	10 flying south	SP
17/02/2023	Vantage Point Survey, VP15	Reed Bunting	1 calling n of VP	SP
17/02/2023	Vantage Point Survey, VP15	Siskin	1 flying n over VP	SP
17/02/2023	Vantage Point Survey, VP15	Raven	8 flying east 11:22	SP
17/02/2023	Vantage Point Survey, VP15	Woodpigeon	25 flying south	SP
17/02/2023	Vantage Point Survey, VP15	Common Redpoll	2 flying NW over SP	SP
17/02/2023	Vantage Point Survey, VP15	Jackdaw	2 flying east	SP
17/02/2023	Vantage Point Survey, VP15	Raven	4 flying SW 11:44	SP

Date	Survey	Species	Notes	Surveyor
17/02/2023	Vantage Point Survey, VP15	Rook	250 over trees se of VP	SP
17/02/2023	Vantage Point Survey, VP15	Reed Bunting	1 flying n over VP	SP
17/02/2023	Vantage Point Survey, VP15	Pied Wagtail	1 flying SW	SP
17/02/2023	Vantage Point Survey, VP15	Chaffinch	2 flying NW	SP
17/02/2023	Vantage Point Survey, VP15	Woodpigeon	150 flying SW over trees se of VP	SP
18/02/2023	Vantage Point Survey, VP16	Woodpigeon		EF
18/02/2023	Vantage Point Survey, VP16	Hooded Crow		EF
18/02/2023	Vantage Point Survey, VP16	Raven		EF
18/02/2023	Vantage Point Survey, VP16	Robin		EF
18/02/2023	Vantage Point Survey, VP16	Wren		EF
18/02/2023	Vantage Point Survey, VP16	Blackbird		EF
18/02/2023	Vantage Point Survey, VP16	Dunnoek		EF
18/02/2023	Vantage Point Survey, VP16	Starling		EF
18/02/2023	Vantage Point Survey, VP16	Lesser Redpoll		EF
18/02/2023	Vantage Point Survey, VP16	Skylark	singing	EF
18/02/2023	Vantage Point Survey, VP16	Magpie		EF
18/02/2023	Vantage Point Survey, VP16	Reed Bunting		EF
18/02/2023	Vantage Point Survey, VP16	Rook		EF
20/02/2023	Vantage Point Survey, VP14	Blackbird	singing 07:02	SP
20/02/2023	Vantage Point Survey, VP14	Robin	singing 07:03	SP
20/02/2023	Vantage Point Survey, VP14	Wren	singing 07:03	SP
20/02/2023	Vantage Point Survey, VP14	Song Thrush	singing 07:10	SP
20/02/2023	Vantage Point Survey, VP14	Fieldfare	1 flying west over VP	SP
20/02/2023	Vantage Point Survey, VP14	Common Redpoll	2 flying n over VP	SP
20/02/2023	Vantage Point Survey, VP14	Fieldfare	15 flying NW calling	SP
20/02/2023	Vantage Point Survey, VP14	Common Redpoll	2 flying NW over VP	SP
20/02/2023	Vantage Point Survey, VP14	Hooded Crow	1 flying NW over VP	SP
20/02/2023	Vantage Point Survey, VP14	Raven	1 flying w 07:50	SP
20/02/2023	Vantage Point Survey, VP14	Starling	200 flying se over VP	SP
20/02/2023	Vantage Point Survey, VP14	Woodpigeon	10 flying e	SP
20/02/2023	Vantage Point Survey, VP14	Raven	1 flying s 08:50	SP
20/02/2023	Vantage Point Survey, VP14	Chaffinch	3 flying s over VP	SP
20/02/2023	Vantage Point Survey, VP14	Raven	1 flying s 09:10	SP
20/02/2023	Vantage Point Survey, VP14	Raven	5 flying n 09:22	SP
20/02/2023	Vantage Point Survey, VP14	Hooded Crow	2 flying e	SP
20/02/2023	Vantage Point Survey, VP14	Common Redpoll	5 flying ne 11:11	SP
20/02/2023	Vantage Point Survey, VP14	Common Redpoll	2 flying n over VP 12:17	SP
20/02/2023	Vantage Point Survey, VP14	Rook	100 over trees e of VP	SP
21/02/2023	Vantage Point Survey, VP5	Song Thrush		KB
21/02/2023	Vantage Point Survey, VP5	Robin		KB
21/02/2023	Vantage Point Survey, VP5	Wren		KB
21/02/2023	Vantage Point Survey, VP5	Blackbird		KB
21/02/2023	Vantage Point Survey, VP5	Hooded Crow		KB

Date	Survey	Species	Notes	Surveyor
21/02/2023	Vantage Point Survey, VP5	Woodpigeon		KB
21/02/2023	Vantage Point Survey, VP5	Blue Tit		KB
21/02/2023	Vantage Point Survey, VP5	Reed Bunting		KB
21/02/2023	Vantage Point Survey, VP5	Fieldfare		KB
23/02/2023	Vantage Point Survey, VP10	Pied Wagtail		KB
23/02/2023	Vantage Point Survey, VP10	Woodpigeon		KB
23/02/2023	Vantage Point Survey, VP10	Blackbird		KB
23/02/2023	Vantage Point Survey, VP10	Wren		KB
23/02/2023	Vantage Point Survey, VP10	Chaffinch		KB
23/02/2023	Vantage Point Survey, VP10	Hooded Crow		KB
23/02/2023	Vantage Point Survey, VP10	Song Thrush		KB
23/02/2023	Vantage Point Survey, VP10	Long-tailed Tit		KB
23/02/2023	Vantage Point Survey, VP10	Coal Tit		KB
23/02/2023	Vantage Point Survey, VP10	Rook		KB
23/02/2023	Vantage Point Survey, VP10	Lesser Redpoll		KB
23/02/2023	Vantage Point Survey, VP10	Great Tit		KB
23/02/2023	Vantage Point Survey, VP10	Stonechat		KB
23/02/2023	Vantage Point Survey, VP10	Raven		KB
23/02/2023	Winter Walkover Survey, T4	Robin		KB
23/02/2023	Winter Walkover Survey, T4	Woodpigeon		KB
23/02/2023	Winter Walkover Survey, T4	Raven		KB
23/02/2023	Winter Walkover Survey, T4	Wren		KB
23/02/2023	Winter Walkover Survey, T4	Reed Bunting		KB
23/02/2023	Winter Walkover Survey, T4	Mistle Thrush		KB
23/02/2023	Winter Walkover Survey, T4	Hooded Crow		KB
27/02/2023	Vantage Point Survey, VP6	Wren		KB
27/02/2023	Vantage Point Survey, VP6	Hooded Crow		KB
27/02/2023	Vantage Point Survey, VP6	Woodpigeon		KB
27/02/2023	Vantage Point Survey, VP6	Robin		KB
27/02/2023	Vantage Point Survey, VP6	Lesser Redpoll		KB
27/02/2023	Vantage Point Survey, VP6	Fieldfare		KB
27/02/2023	Vantage Point Survey, VP6	Blackbird		KB
27/02/2023	Vantage Point Survey, VP6	Stonechat		KB
27/02/2023	Winter Walkover Survey, T3	Chaffinch		KB
27/02/2023	Winter Walkover Survey, T3	Robin		KB
27/02/2023	Winter Walkover Survey, T3	Blackbird		KB
27/02/2023	Winter Walkover Survey, T3	Rook		KB
27/02/2023	Winter Walkover Survey, T3	Hooded Crow		KB
27/02/2023	Winter Walkover Survey, T3	Woodpigeon		KB
27/02/2023	Winter Walkover Survey, T3	Pied Wagtail		KB
27/02/2023	Winter Walkover Survey, T3	Blue Tit		KB
01/03/2023	Vantage Point Survey, VP7	Blackbird		KB
01/03/2023	Vantage Point Survey, VP7	Robin		KB
01/03/2023	Vantage Point Survey, VP7	Great Tit		KB
01/03/2023	Vantage Point Survey, VP7	Song Thrush		KB
01/03/2023	Vantage Point Survey, VP7	Woodpigeon		KB

Date	Survey	Species	Notes	Surveyor
01/03/2023	Vantage Point Survey, VP7	Hooded Crow		KB
01/03/2023	Vantage Point Survey, VP7	Reed Bunting		KB
01/03/2023	Vantage Point Survey, VP7	Wren		KB
01/03/2023	Vantage Point Survey, VP7	Starling		KB
01/03/2023	Vantage Point Survey, VP7	Blue Tit		KB
01/03/2023	Vantage Point Survey, VP7	Chaffinch		KB
01/03/2023	Vantage Point Survey, VP7	Raven		KB
01/03/2023	Vantage Point Survey, VP7	Coal Tit		KB
01/03/2023	Vantage Point Survey, VP7	Goldcrest		KB
02/03/2023	Vantage Point Survey, VP1	Mistle Thrush		EOB
02/03/2023	Vantage Point Survey, VP1	Chaffinch		EOB
02/03/2023	Vantage Point Survey, VP1	Wren		EOB
02/03/2023	Vantage Point Survey, VP1	Robin		EOB
02/03/2023	Vantage Point Survey, VP1	Song Thrush		EOB
02/03/2023	Vantage Point Survey, VP1	Woodpigeon		EOB
02/03/2023	Vantage Point Survey, VP1	Coal Tit		EOB
02/03/2023	Vantage Point Survey, VP1	Blue Tit		EOB
02/03/2023	Vantage Point Survey, VP1	Bullfinch		EOB
02/03/2023	Vantage Point Survey, VP1	Skylark		EOB
02/03/2023	Vantage Point Survey, VP1	Hooded Crow		EOB
02/03/2023	Vantage Point Survey, VP1	Rook		EOB
02/03/2023	Vantage Point Survey, VP1	Goldfinch		EOB
02/03/2023	Vantage Point Survey, VP1	Lesser Redpoll		EOB
02/03/2023	Vantage Point Survey, VP1	Starling		EOB
02/03/2023	Vantage Point Survey, VP1	Linnet		EOB
02/03/2023	Vantage Point Survey, VP1	Blackbird		EOB
02/03/2023	Vantage Point Survey, VP1	Great Tit		EOB
02/03/2023	Vantage Point Survey, VP1	Goldcrest		EOB
02/03/2023	Vantage Point Survey, VP1	Fieldfare		EOB
02/03/2023	Vantage Point Survey, VP1	Raven		EOB
02/03/2023	Vantage Point Survey, VP1	Long-tailed Tit		EOB
02/03/2023	Vantage Point Survey, VP15	Reed Bunting	1 male calling s of VP	SP
02/03/2023	Vantage Point Survey, VP15	Hooded Crow	2 flying ne	SP
02/03/2023	Vantage Point Survey, VP15	Blackbird	1 alarm call n of VP	SP
02/03/2023	Vantage Point Survey, VP15	Common Redpoll	2 flying e	SP
02/03/2023	Vantage Point Survey, VP15	Wren	1 calling n of VP	SP
02/03/2023	Vantage Point Survey, VP15	Robin	singing ne of VP	SP
02/03/2023	Vantage Point Survey, VP15	Reed Bunting	1 flying NW	SP
02/03/2023	Vantage Point Survey, VP15	Raven	5 over bog e of VP	SP
02/03/2023	Vantage Point Survey, VP15	Raven	3 flying s	SP
02/03/2023	Vantage Point Survey, VP15	Linnet	2 flying w	SP
02/03/2023	Vantage Point Survey, VP15	Siskin	2 flying ne	SP
02/03/2023	Vantage Point Survey, VP15	Starling	60 flying east	SP
02/03/2023	Vantage Point Survey, VP15	Woodpigeon	2 flying e	SP
02/03/2023	Vantage Point Survey, VP15	Raven	14:26 8 flying SW	SP

Date	Survey	Species	Notes	Surveyor
02/03/2023	Vantage Point Survey, VP15	Magpie	2 flying s east of VP	SP
02/03/2023	Vantage Point Survey, VP15	Rook	25 flying n	SP
02/03/2023	Vantage Point Survey, VP15	Woodpigeon	16:10 25 east of VP	SP
02/03/2023	Vantage Point Survey, VP15	Rook	16:20 250 flying ne	SP
02/03/2023	Vantage Point Survey, VP15	Jackdaw	16:47 45 flying e	SP
02/03/2023	Vantage Point Survey, VP15	Starling	200 east of VP	SP
02/03/2023	Vantage Point Survey, VP15	Stonechat	2 south of VP	SP
02/03/2023	Vantage Point Survey, VP15	Starling	17:20 250 flying NW	SP
02/03/2023	Vantage Point Survey, VP15	Raven	2 flying e	SP
02/03/2023	Vantage Point Survey, VP15	Starling	17:28 200 flying NW	SP
02/03/2023	Vantage Point Survey, VP15	Fieldfare	17:40 300 flying SW	SP
02/03/2023	Vantage Point Survey, VP15	Raven	17:50 18 flying ne	SP
02/03/2023	Vantage Point Survey, VP15	Hooded Crow	18:04 2 flying e	SP
02/03/2023	Vantage Point Survey, VP15	Blackbird	2 calling ne of VP	SP
03/03/2023	Vantage Point Survey, VP13	Hooded Crow	4 flying e over the bog	SP
03/03/2023	Vantage Point Survey, VP13	Raven	6 flying ne	SP
03/03/2023	Vantage Point Survey, VP13	Raven	13:19 7 flying SW	SP
03/03/2023	Vantage Point Survey, VP13	Starling	200 over trees se of VP	SP
03/03/2023	Vantage Point Survey, VP13	Woodpigeon	50 over trees se of VP	SP
03/03/2023	Vantage Point Survey, VP13	Rook	50 over trees e of VP	SP
03/03/2023	Vantage Point Survey, VP13	Starling	16:52 300 flying W	SP
03/03/2023	Vantage Point Survey, VP13	Starling	17:21 350 flying NW	SP
03/03/2023	Vantage Point Survey, VP13	Starling	17:28 70 flying NW	SP
03/03/2023	Vantage Point Survey, VP13	Raven	17:32 22 flying NE	SP
03/03/2023	Vantage Point Survey, VP13	Chaffinch	20 flying SW	SP
03/03/2023	Vantage Point Survey, VP13	Rook	17:47 150 flying ne	SP
03/03/2023	Vantage Point Survey, VP13	Wren	1 calling 18:01	SP
03/03/2023	Vantage Point Survey, VP13	Raven	18:06 9 flying ne	SP
06/03/2023	Vantage Point Survey, VP2	Wren		EOB
06/03/2023	Vantage Point Survey, VP2	Hooded Crow		EOB
06/03/2023	Vantage Point Survey, VP2	Robin		EOB
06/03/2023	Vantage Point Survey, VP2	Woodpigeon		EOB
06/03/2023	Vantage Point Survey, VP2	Chaffinch		EOB
06/03/2023	Vantage Point Survey, VP2	Starling		EOB
06/03/2023	Vantage Point Survey, VP2	Rook		EOB
06/03/2023	Vantage Point Survey, VP2	Raven		EOB
06/03/2023	Vantage Point Survey, VP2	Jackdaw		EOB
06/03/2023	Vantage Point Survey, VP2	Song Thrush		EOB
06/03/2023	Vantage Point Survey, VP2	Mistle Thrush		EOB
06/03/2023	Vantage Point Survey, VP2	Goldfinch		EOB
06/03/2023	Vantage Point Survey, VP2	Blue Tit		EOB
06/03/2023	Vantage Point Survey, vp9	Wren		FLM
06/03/2023	Vantage Point Survey, vp9	Robin		FLM
06/03/2023	Vantage Point Survey, vp9	Goldfinch		FLM
06/03/2023	Vantage Point Survey, vp9	Song Thrush		FLM
06/03/2023	Vantage Point Survey, vp9	Mistle Thrush		FLM

Date	Survey	Species	Notes	Surveyor
06/03/2023	Vantage Point Survey, vp9	Rook		FLM
06/03/2023	Vantage Point Survey, vp9	Hooded Crow		FLM
06/03/2023	Vantage Point Survey, vp9	Dunnoek		FLM
07/03/2023	Vantage Point Survey, VP3	Stonechat	pair	EOB
07/03/2023	Vantage Point Survey, VP3	Fieldfare		EOB
07/03/2023	Vantage Point Survey, VP3	Magpie		EOB
07/03/2023	Vantage Point Survey, VP3	Rook		EOB
07/03/2023	Vantage Point Survey, VP3	Hooded Crow		EOB
07/03/2023	Vantage Point Survey, VP3	Lesser Redpoll		EOB
07/03/2023	Vantage Point Survey, VP3	Goldfinch		EOB
07/03/2023	Vantage Point Survey, VP3	Chaffinch		EOB
07/03/2023	Vantage Point Survey, VP3	Reed Bunting	pair	EOB
07/03/2023	Vantage Point Survey, VP3	Jackdaw		EOB
07/03/2023	Vantage Point Survey, VP3	Woodpigeon		EOB
07/03/2023	Vantage Point Survey, VP3	Raven		EOB
07/03/2023	Vantage Point Survey, VP3	Great Tit		EOB
07/03/2023	Vantage Point Survey, VP3	Blue Tit		EOB
07/03/2023	Vantage Point Survey, VP3	Feral Pigeon		EOB
07/03/2023	Vantage Point Survey, VP3	Mistle Thrush		EOB
07/03/2023	Vantage Point Survey, VP3	Skylark		EOB
07/03/2023	Vantage Point Survey, VP3	Wren		EOB
07/03/2023	Vantage Point Survey, VP3	Starling		EOB
07/03/2023	Vantage Point Survey, VP3	Blackbird		EOB
07/03/2023	Vantage Point Survey, vp10	Pied Wagtail		FLM
07/03/2023	Vantage Point Survey, vp10	Raven		FLM
07/03/2023	Vantage Point Survey, vp10	Long-tailed Tit		FLM
07/03/2023	Vantage Point Survey, vp10	Great Tit		FLM
07/03/2023	Vantage Point Survey, vp10	Blackbird		FLM
07/03/2023	Vantage Point Survey, vp10	Blue Tit		FLM
07/03/2023	Vantage Point Survey, vp10	Goldfinch		FLM
07/03/2023	Vantage Point Survey, vp10	Rook		FLM
07/03/2023	Vantage Point Survey, vp10	Raven		FLM
07/03/2023	Vantage Point Survey, vp10	Goldcrest		FLM
07/03/2023	Vantage Point Survey, vp10	Chaffinch		FLM
08/03/2023	Vantage Point Survey, VP6	Blackbird		EOB
08/03/2023	Vantage Point Survey, VP6	Skylark		EOB
08/03/2023	Vantage Point Survey, VP6	Raven		EOB
08/03/2023	Vantage Point Survey, VP6	Hooded Crow		EOB
08/03/2023	Vantage Point Survey, VP6	Rook		EOB
08/03/2023	Vantage Point Survey, VP6	Starling		EOB
08/03/2023	Vantage Point Survey, VP6	Woodpigeon		EOB
08/03/2023	Vantage Point Survey, VP6	Jackdaw		EOB
08/03/2023	Vantage Point Survey, VP6	Goldfinch		EOB
08/03/2023	Vantage Point Survey, VP6	Chaffinch		EOB
08/03/2023	Vantage Point Survey, VP6	Wren		EOB
13/03/2023	Vantage Point Survey, VP4	Bullfinch		EOB

Date	Survey	Species	Notes	Surveyor
13/03/2023	Vantage Point Survey, VP4	Wren		EOB
13/03/2023	Vantage Point Survey, VP4	Goldfinch		EOB
13/03/2023	Vantage Point Survey, VP4	Robin		EOB
13/03/2023	Vantage Point Survey, VP4	Blackbird		EOB
13/03/2023	Vantage Point Survey, VP4	Rook		EOB
13/03/2023	Vantage Point Survey, VP4	Jackdaw		EOB
13/03/2023	Vantage Point Survey, VP4	Hooded Crow		EOB
13/03/2023	Vantage Point Survey, VP4	Lesser Redpoll		EOB
13/03/2023	Vantage Point Survey, VP4	Song Thrush		EOB
13/03/2023	Vantage Point Survey, VP4	Greenfinch		EOB
13/03/2023	Vantage Point Survey, VP4	Woodpigeon		EOB
13/03/2023	Vantage Point Survey, VP4	Long-tailed Tit		EOB
13/03/2023	Vantage Point Survey, VP4	Fieldfare		EOB
13/03/2023	Vantage Point Survey, VP4	Starling		EOB
13/03/2023	Vantage Point Survey, VP4	Chaffinch		EOB
13/03/2023	Vantage Point Survey, VP4	Pheasant		EOB
14/03/2023	Vantage Point Survey, VP12	Mistle Thrush	5 flying N	SP
14/03/2023	Vantage Point Survey, VP12	Woodpigeon	2 over trees NW of VP	SP
14/03/2023	Vantage Point Survey, VP12	Pied Wagtail	2 w of VP	SP
14/03/2023	Vantage Point Survey, VP12	Hooded Crow	2 NW of VP on bog	SP
14/03/2023	Vantage Point Survey, VP12	Mistle Thrush	2 n of VP	SP
14/03/2023	Vantage Point Survey, VP12	Raven	13:00 1 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Woodpigeon	2 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Raven	13:10 2 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Chaffinch	2 flying e	SP
14/03/2023	Vantage Point Survey, VP12	Goldfinch	1 flying w	SP
14/03/2023	Vantage Point Survey, VP12	Starling	5 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Rook	10 nest building ne of VP	SP
14/03/2023	Vantage Point Survey, VP12	Blackbird	1 flying w	SP
14/03/2023	Vantage Point Survey, VP12	Woodpigeon	3 flying e	SP
14/03/2023	Vantage Point Survey, VP12	Mistle Thrush	2 ne of VP	SP
14/03/2023	Vantage Point Survey, VP12	Raven	17:18 flying se	SP
14/03/2023	Vantage Point Survey, VP12	Magpie	2 ne of VP	SP
14/03/2023	Vantage Point Survey, VP12	Starling	50 flying w over VP	SP
14/03/2023	Vantage Point Survey, VP12	Fieldfare	34 flying into trees ENE of VP	SP
14/03/2023	Vantage Point Survey, VP12	Starling	18:27 300 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Raven	18:32 11 flying NW	SP
14/03/2023	Vantage Point Survey, VP12	Song Thrush	1 singing e of VP	SP
14/03/2023	Vantage Point Survey, VP12	Rook	30 into trees NW of VP	SP
14/03/2023	Vantage Point Survey, VP12	Rook	18:48 50 flying se	SP
14/03/2023	Vantage Point Survey, VP12	Rook	18:55 150 milling about NW of VP	SP
14/03/2023	Vantage Point Survey, VP12	Raven	18:55 4 on pylons NW of VP	SP
15/03/2023	Vantage Point Survey, VP5	Long-tailed Tit		EOB
15/03/2023	Vantage Point Survey, VP5	Blue Tit		EOB
15/03/2023	Vantage Point Survey, VP5	Great Tit		EOB
15/03/2023	Vantage Point Survey, VP5	Wren		EOB

Date	Survey	Species	Notes	Surveyor
15/03/2023	Vantage Point Survey, VP5	Robin		EOB
15/03/2023	Vantage Point Survey, VP5	Blackbird		EOB
15/03/2023	Vantage Point Survey, VP5	Chaffinch		EOB
15/03/2023	Vantage Point Survey, VP5	Goldfinch		EOB
15/03/2023	Vantage Point Survey, VP5	Reed Bunting		EOB
15/03/2023	Vantage Point Survey, VP5	Fieldfare		EOB
15/03/2023	Vantage Point Survey, VP5	Woodpigeon		EOB
15/03/2023	Vantage Point Survey, VP5	Lesser Redpoll		EOB
15/03/2023	Vantage Point Survey, VP5	Dunnock		EOB
15/03/2023	Vantage Point Survey, VP5	Jackdaw		EOB
15/03/2023	Vantage Point Survey, VP5	Song Thrush		EOB
15/03/2023	Vantage Point Survey, vp11	Wren		FLM
15/03/2023	Vantage Point Survey, vp11	Long-tailed Tit		FLM
15/03/2023	Vantage Point Survey, vp11	Dunnock		FLM
15/03/2023	Vantage Point Survey, vp11	Song Thrush		FLM
15/03/2023	Vantage Point Survey, vp11	Jackdaw		FLM
15/03/2023	Vantage Point Survey, vp11	Rook		FLM
15/03/2023	Vantage Point Survey, vp11	Raven		FLM
15/03/2023	Vantage Point Survey, vp11	Great Tit		FLM
15/03/2023	Vantage Point Survey, vp11	Robin		FLM
15/03/2023	Vantage Point Survey, vp11	Woodpigeon		FLM
15/03/2023	Vantage Point Survey, vp11	Blackbird		FLM
15/03/2023	Vantage Point Survey, vp11	Chaffinch		FLM
20/03/2023	Vantage Point Survey, VP16	Robin		EF
20/03/2023	Vantage Point Survey, VP16	Wren		EF
20/03/2023	Vantage Point Survey, VP16	Blackbird		EF
20/03/2023	Vantage Point Survey, VP16	Skylark		EF
20/03/2023	Vantage Point Survey, VP16	Raven		EF
20/03/2023	Vantage Point Survey, VP16	Reed Bunting		EF
20/03/2023	Vantage Point Survey, VP16	Hooded Crow		EF
20/03/2023	Vantage Point Survey, VP16	Lesser Redpoll		EF
20/03/2023	Vantage Point Survey, VP16	Blue Tit		EF
20/03/2023	Vantage Point Survey, VP16	Woodpigeon		EF
20/03/2023	Vantage Point Survey, VP16	Fieldfare		EF
20/03/2023	Vantage Point Survey, vp9	Bullfinch		FLM
20/03/2023	Vantage Point Survey, vp9	Blackbird		FLM
20/03/2023	Vantage Point Survey, vp9	Long-tailed Tit		FLM
20/03/2023	Vantage Point Survey, vp9	Stonechat		FLM
20/03/2023	Vantage Point Survey, vp9	Reed Bunting		FLM
20/03/2023	Vantage Point Survey, vp9	Great Tit		FLM
20/03/2023	Vantage Point Survey, VP11	Sand Martin		KB
20/03/2023	Vantage Point Survey, VP11	Starling		KB
20/03/2023	Vantage Point Survey, VP11	Raven		KB
20/03/2023	Vantage Point Survey, VP11	Blue Tit		KB
20/03/2023	Vantage Point Survey, VP11	Woodpigeon		KB
20/03/2023	Vantage Point Survey, VP14	Fieldfare	100 flying e	SP

Date	Survey	Species	Notes	Surveyor
20/03/2023	Vantage Point Survey, VP14	Wren	1 calling	SP
20/03/2023	Vantage Point Survey, VP14	Robin	1 singing	SP
20/03/2023	Vantage Point Survey, VP14	Chaffinch	2 flying s	SP
20/03/2023	Vantage Point Survey, VP14	Blackbird	1 calling	SP
20/03/2023	Vantage Point Survey, VP14	Common Redpoll	1 flying w	SP
20/03/2023	Vantage Point Survey, VP14	Fieldfare	100 SW of VP flying SW	SP
20/03/2023	Vantage Point Survey, VP14	Raven	2 flying w	SP
20/03/2023	Vantage Point Survey, VP14	Sand Martin	2 flying s east of VP	SP
20/03/2023	Vantage Point Survey, VP14	Linnet	2 flying s	SP
20/03/2023	Vantage Point Survey, VP14	Reed Bunting	1 male ne of VP	SP
20/03/2023	Vantage Point Survey, VP14	Starling	250 flying NW	SP
20/03/2023	Vantage Point Survey, VP14	Fieldfare	250 flying NW	SP
20/03/2023	Vantage Point Survey, VP14	Hooded Crow	2 east of VP	SP
20/03/2023	Vantage Point Survey, VP14	Raven	15:13 2 flying e	SP
20/03/2023	Vantage Point Survey, VP14	Common Redpoll	2 flying ne	SP
20/03/2023	Vantage Point Survey, VP14	Chaffinch	1 flying s	SP
20/03/2023	Vantage Point Survey, VP14	Rook	25 over trees east of VP	SP
20/03/2023	Vantage Point Survey, VP14	Raven	17:20 10 flying e	SP
20/03/2023	Vantage Point Survey, VP14	Stonechat	1 male se of VP	SP
20/03/2023	Vantage Point Survey, VP14	Fieldfare	18:06 75 flying se	SP
20/03/2023	Vantage Point Survey, VP14	Song Thrush	19:14 singing	SP
21/03/2023	Vantage Point Survey, VP7	Robin		KB
21/03/2023	Vantage Point Survey, VP7	Blackbird		KB
21/03/2023	Vantage Point Survey, VP7	Lesser Redpoll		KB
21/03/2023	Vantage Point Survey, VP7	Hooded Crow		KB
21/03/2023	Vantage Point Survey, VP7	Magpie		KB
21/03/2023	Vantage Point Survey, VP7	Mistle Thrush		KB
21/03/2023	Vantage Point Survey, VP7	Fieldfare		KB
22/03/2023	Vantage Point Survey, VP8	Blue Tit		KB
22/03/2023	Vantage Point Survey, VP8	Great Tit		KB
22/03/2023	Vantage Point Survey, VP8	Wren		KB
22/03/2023	Vantage Point Survey, VP8	Hooded Crow		KB
22/03/2023	Vantage Point Survey, VP8	Woodpigeon		KB
22/03/2023	Vantage Point Survey, VP8	Robin		KB
22/03/2023	Vantage Point Survey, VP8	Blackbird		KB
22/03/2023	Vantage Point Survey, VP8	Jay		KB
22/03/2023	Vantage Point Survey, VP8	Mistle Thrush		KB
22/03/2023	Vantage Point Survey, VP8	Starling		KB
22/03/2023	Vantage Point Survey, VP8	Pheasant		KB
23/03/2023	Winter Walkover Survey, T4	Blackbird		KS
23/03/2023	Winter Walkover Survey, T4	Robin		KS
23/03/2023	Winter Walkover Survey, T4	Reed Bunting		KS
23/03/2023	Winter Walkover Survey, T4	Skylark		KS
23/03/2023	Winter Walkover Survey, T4	Stonechat		KS
23/03/2023	Winter Walkover Survey, T4	Mistle Thrush		KS

Date	Survey	Species	Notes	Surveyor
23/03/2023	Winter Walkover Survey, T4	Song Thrush		KS
23/03/2023	Winter Walkover Survey, T4	Magpie		KS
23/03/2023	Winter Walkover Survey, T4	Rook		KS
23/03/2023	Winter Walkover Survey, T4	Raven		KS
23/03/2023	Winter Walkover Survey, T4	Woodpigeon		KS
23/03/2023	Winter Walkover Survey, T4	Goldfinch		KS
23/03/2023	Winter Walkover Survey, T4	Linnet		KS
23/03/2023	Winter Walkover Survey, T4	Lesser Redpoll		KS
23/03/2023	Winter Walkover Survey, T4	Chaffinch		KS
23/03/2023	Winter Walkover Survey, T4	Blue Tit		KS
23/03/2023	Winter Walkover Survey, T4	Coal Tit		KS
23/03/2023	Winter Walkover Survey, T4	Great Tit		KS
23/03/2023	Winter Walkover Survey, T4	Pheasant		KS
23/03/2023	Winter Walkover Survey, T4	Duncock		KS
23/03/2023	Winter Walkover Survey, T3	Blackbird		KS
23/03/2023	Winter Walkover Survey, T3	Robin		KS
23/03/2023	Winter Walkover Survey, T3	Reed Bunting		KS
23/03/2023	Winter Walkover Survey, T3	Skylark		KS
23/03/2023	Winter Walkover Survey, T3	Stonechat		KS
23/03/2023	Winter Walkover Survey, T3	Mistle Thrush		KS
23/03/2023	Winter Walkover Survey, T3	Song Thrush		KS
23/03/2023	Winter Walkover Survey, T3	Magpie		KS
23/03/2023	Winter Walkover Survey, T3	Rook		KS
23/03/2023	Winter Walkover Survey, T3	Raven		KS
23/03/2023	Winter Walkover Survey, T3	Woodpigeon		KS
23/03/2023	Winter Walkover Survey, T3	Goldfinch		KS
23/03/2023	Winter Walkover Survey, T3	Linnet		KS
23/03/2023	Winter Walkover Survey, T3	Lesser Redpoll		KS
23/03/2023	Winter Walkover Survey, T3	Chaffinch		KS
23/03/2023	Winter Walkover Survey, T3	Blue Tit		KS
23/03/2023	Winter Walkover Survey, T3	Coal Tit		KS
23/03/2023	Winter Walkover Survey, T3	Great Tit		KS
23/03/2023	Winter Walkover Survey, T3	Jay		KS
23/03/2023	Winter Walkover Survey, T1	Duncock		KS
23/03/2023	Winter Walkover Survey, T1	Blackbird		KS
23/03/2023	Winter Walkover Survey, T1	Robin		KS
23/03/2023	Winter Walkover Survey, T1	Reed Bunting		KS
23/03/2023	Winter Walkover Survey, T1	Skylark		KS
23/03/2023	Winter Walkover Survey, T1	Stonechat		KS
23/03/2023	Winter Walkover Survey, T1	Mistle Thrush		KS
23/03/2023	Winter Walkover Survey, T1	Song Thrush		KS
23/03/2023	Winter Walkover Survey, T1	Magpie		KS
23/03/2023	Winter Walkover Survey, T1	Rook		KS
23/03/2023	Winter Walkover Survey, T1	Raven		KS
23/03/2023	Winter Walkover Survey, T1	Woodpigeon		KS
23/03/2023	Winter Walkover Survey, T1	Goldfinch		KS

Date	Survey	Species	Notes	Surveyor
23/03/2023	Winter Walkover Survey, T1	Linnet		KS
23/03/2023	Winter Walkover Survey, T1	Lesser Redpoll		KS
23/03/2023	Winter Walkover Survey, T1	Chaffinch		KS
23/03/2023	Winter Walkover Survey, T1	Blue Tit		KS
23/03/2023	Winter Walkover Survey, T1	Coal Tit		KS
23/03/2023	Winter Walkover Survey, T1	Great Tit		KS
23/03/2023	Winter Walkover Survey, T2	Dunnoek		KS
23/03/2023	Winter Walkover Survey, T2	Blackbird		KS
23/03/2023	Winter Walkover Survey, T2	Robin		KS
23/03/2023	Winter Walkover Survey, T2	Reed Bunting		KS
23/03/2023	Winter Walkover Survey, T2	Skylark		KS
23/03/2023	Winter Walkover Survey, T2	Stonechat		KS
23/03/2023	Winter Walkover Survey, T2	Mistle Thrush		KS
23/03/2023	Winter Walkover Survey, T2	Song Thrush		KS
23/03/2023	Winter Walkover Survey, T2	Magpie		KS
23/03/2023	Winter Walkover Survey, T2	Rook		KS
23/03/2023	Winter Walkover Survey, T2	Raven		KS
23/03/2023	Winter Walkover Survey, T2	Woodpigeon		KS
23/03/2023	Winter Walkover Survey, T2	Goldfinch		KS
23/03/2023	Winter Walkover Survey, T2	Linnet		KS
23/03/2023	Winter Walkover Survey, T2	Lesser Redpoll		KS
23/03/2023	Winter Walkover Survey, T2	Chaffinch		KS
23/03/2023	Winter Walkover Survey, T2	Blue Tit		KS
23/03/2023	Winter Walkover Survey, T2	Coal Tit		KS
23/03/2023	Winter Walkover Survey, T2	Great Tit		KS
23/03/2023	Vantage Point Survey, VP3	Woodpigeon	1 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Raven	1 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Mistle Thrush	2 flying SW	SP
23/03/2023	Vantage Point Survey, VP3	Raven	2 displaying w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Raven	1 flying se	SP
23/03/2023	Vantage Point Survey, VP3	Rook	20 flying SW	SP
23/03/2023	Vantage Point Survey, VP3	Goldfinch	3 flying NW	SP
23/03/2023	Vantage Point Survey, VP3	Jackdaw	40 flying SW	SP
23/03/2023	Vantage Point Survey, VP3	Hooded Crow	2 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Dunnoek	1 singing w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Blackbird	1 singing w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Siskin	2 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Goldfinch	2 flying SW	SP
23/03/2023	Vantage Point Survey, VP3	Magpie	3 w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Rook	25 flying se over VP	SP
23/03/2023	Vantage Point Survey, VP3	Song Thrush	1 singing w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Pheasant	4 calling w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Chaffinch	2 flying e over VP	SP
23/03/2023	Vantage Point Survey, VP3	Starling	3 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Fieldfare	2 flying s	SP
23/03/2023	Vantage Point Survey, VP3	Raven	5 18:41 NW of VP	SP

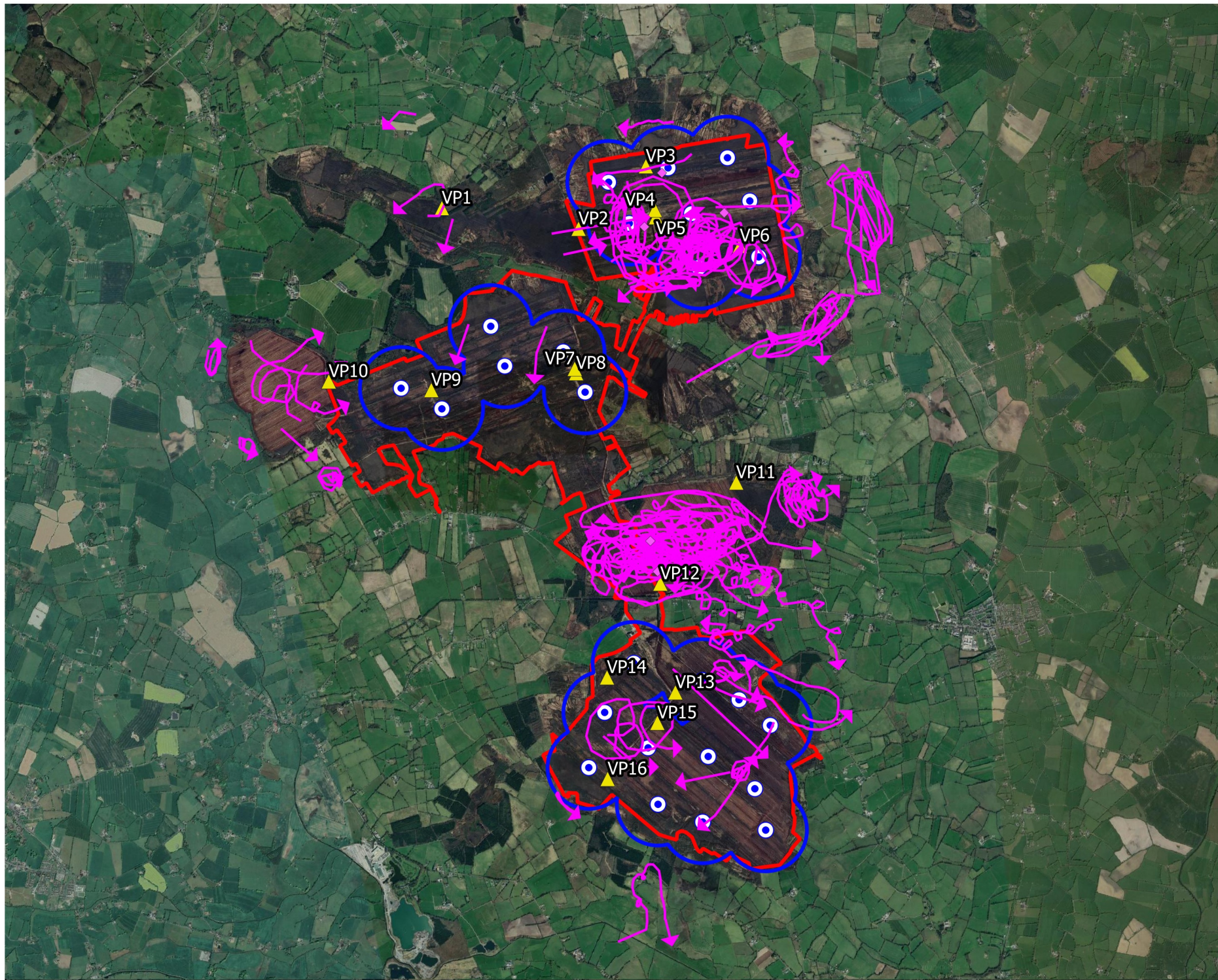
Date	Survey	Species	Notes	Surveyor
23/03/2023	Vantage Point Survey, VP3	Woodpigeon	25 flying SW	SP
23/03/2023	Vantage Point Survey, VP3	Raven	6 1900 w of VP	SP
23/03/2023	Vantage Point Survey, VP3	Raven	8 19:07 NW of VP	SP
24/03/2023	Vantage Point Survey, VP10	Blackbird		KB
24/03/2023	Vantage Point Survey, VP10	Song Thrush		KB
24/03/2023	Vantage Point Survey, VP10	Robin		KB
24/03/2023	Vantage Point Survey, VP10	Blue Tit		KB
24/03/2023	Vantage Point Survey, VP10	Goldcrest		KB
24/03/2023	Vantage Point Survey, VP10	Wren		KB
24/03/2023	Vantage Point Survey, VP10	Woodpigeon		KB
24/03/2023	Vantage Point Survey, VP10	Great Tit		KB
24/03/2023	Vantage Point Survey, VP10	Coal Tit		KB
24/03/2023	Vantage Point Survey, VP10	Hooded Crow		KB
24/03/2023	Vantage Point Survey, VP10	Pied Wagtail		KB
24/03/2023	Vantage Point Survey, VP10	Pheasant		KB
24/03/2023	Vantage Point Survey, VP10	Raven		KB
24/03/2023	Vantage Point Survey, VP10	Rook		KB
28/03/2023	Winter Walkover Survey, T1	Wren		FLM
28/03/2023	Winter Walkover Survey, T1	Robin		FLM
28/03/2023	Winter Walkover Survey, T1	Chaffinch		FLM
28/03/2023	Winter Walkover Survey, T1	Long-tailed Tit		FLM
28/03/2023	Winter Walkover Survey, T1	Stonechat		FLM
28/03/2023	Winter Walkover Survey, T1	Woodpigeon		FLM
28/03/2023	Winter Walkover Survey, T1	Linnet		FLM
28/03/2023	Winter Walkover Survey, T1	Mistle Thrush		FLM
28/03/2023	Winter Walkover Survey, T1	Robin		FLM
28/03/2023	Winter Walkover Survey, T1	Raven		FLM
28/03/2023	Winter Walkover Survey, T1	Hooded Crow		FLM
28/03/2023	Winter Walkover Survey, T1	Bullfinch		FLM
28/03/2023	Winter Walkover Survey, T2	Robin		FLM
28/03/2023	Winter Walkover Survey, T2	Chaffinch		FLM
28/03/2023	Winter Walkover Survey, T2	Fieldfare		FLM
28/03/2023	Winter Walkover Survey, T2	Skylark		FLM
28/03/2023	Winter Walkover Survey, T2	Pheasant		FLM
28/03/2023	Winter Walkover Survey, T2	Coal Tit		FLM
28/03/2023	Winter Walkover Survey, T2	Hooded Crow		FLM
28/03/2023	Winter Walkover Survey, T2	Willow Warbler		FLM
28/03/2023	Winter Walkover Survey, T2	Goldfinch		FLM
28/03/2023	Winter Walkover Survey, T2	Pied Wagtail		FLM
28/03/2023	Winter Walkover Survey, T2	Magpie		FLM
28/03/2023	Winter Walkover Survey, T2	Woodpigeon		FLM
28/03/2023	Winter Walkover Survey, T2	Wren		FLM
28/03/2023	Winter Walkover Survey, T2	Great Tit		FLM
28/03/2023	Winter Walkover Survey, T2	Linnet		FLM
29/03/2023	Winter Walkover Survey, T3	Woodpigeon		FLM
29/03/2023	Winter Walkover Survey, T3	Skylark		FLM

Date	Survey	Species	Notes	Surveyor
29/03/2023	Winter Walkover Survey, T3	Goldcrest		FLM
29/03/2023	Winter Walkover Survey, T3	Coal Tit		FLM
29/03/2023	Winter Walkover Survey, T3	Great Tit		FLM
29/03/2023	Winter Walkover Survey, T3	Chaffinch		FLM
29/03/2023	Winter Walkover Survey, T3	Linnet		FLM
29/03/2023	Winter Walkover Survey, T3	Jackdaw		FLM
29/03/2023	Winter Walkover Survey, T4	Wren		FLM
29/03/2023	Winter Walkover Survey, T4	Duncock		FLM
29/03/2023	Winter Walkover Survey, T4	Reed Bunting		FLM
29/03/2023	Winter Walkover Survey, T4	Rook		FLM
29/03/2023	Winter Walkover Survey, T4	Raven		FLM
29/03/2023	Winter Walkover Survey, T4	Pied Wagtail		FLM
29/03/2023	Winter Walkover Survey, T4	Linnet		FLM
29/03/2023	Winter Walkover Survey, T4	Stonechat		FLM
29/03/2023	Winter Walkover Survey, T4	Mistle Thrush		FLM
29/03/2023	Winter Walkover Survey, T4	Chiffchaff		FLM









APPENDIX 1-2

FIGURES



Map Legend

-  Wind Farm Site
-  Proposed Turbine Layout
-  500m Turbine Buffer
-  Vantage Point Location
-  Flightline
-  Observation

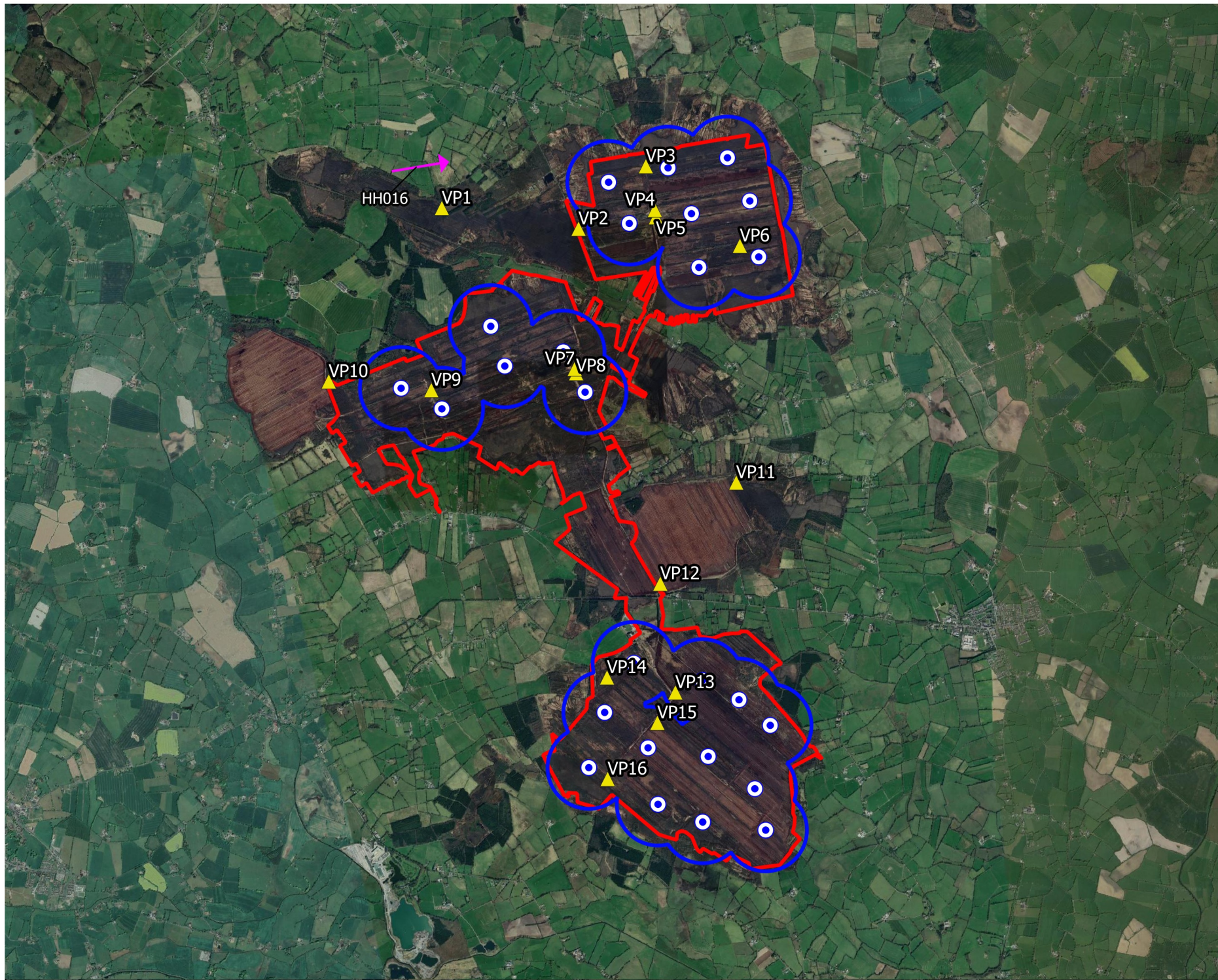


Drawing Title
Golden Plover Observations
Vantage Point Surveys






Project Title
Ballivor Wind Farm

Drawn By FOD	Checked By PM
Project No. 191137-o	Drawing No. Fig 1.1
Scale 1:60,000	Date 15.08.2023

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Map Legend

-  Wind Farm Site
-  Proposed Turbine Layout
-  500m Turbine Buffer
-  Vantage Point Location
-  Flightline



Drawing Title
Hen harrier Observations
Vantage Point Surveys

Project Title
Ballivor Wind Farm

Drawn By FOD	Checked By PM
Project No. 191137-o	Drawing No. Fig 1.2
Scale 1:60,000	Date 15.08.2023

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