

PEN MARCH WIND FARM

Non-breeding Season Bird Surveys 2020-21
Prepared for: **RWE Renewables UK Ltd**

SLR Ref: 406.02273.00066
Version No: 1
May 2021



BASIS OF REPORT

This document has been prepared by SLR with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with RWE Renewables UK Ltd (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

CONTENTS

1.0 INTRODUCTION	1
1.1 Background	1
1.2 Site Description	1
1.3 Scope of Work.....	1
1.4 Purpose of this Report	2
1.5 Target Species	2
1.5.1 Primary Target Species.....	2
1.5.2 Secondary Target Species	2
2.0 SURVEY METHODOLOGY	3
2.1 Survey Areas, Dates and Personnel.....	3
2.2 Flight Activity Surveys	3
2.3 Survey Limitations.....	4
3.0 SURVEY RESULTS	5
3.1 Flight Activity Surveys	5
3.1.1 Species Accounts	5
3.1.2 Secondary Target Species	6
4.0 SUMMARY AND CONCLUSIONS.....	8
4.1 Legal and Conservation Status of Target Species Recorded.....	8

DOCUMENT REFERENCES

TABLES

Table 1-1 Scope of Ornithological Survey Work, Non-breeding Season 2020-21.....	1
Table 2-1 VP Surveys undertaken at Pen March, Non-breeding Season 2020-2021	4
Table 3-1 Number of Primary Target Species Flights from VP1 and VP2 Combined, September 2020 – March 2021	5
Table 4-1 Legal and Conservation Status of Primary and Secondary Target Species	9

FIGURES

- Figure 1: Vantage Points and Viewsheds
 Figure 2: Flight Activity Survey Results, Wildfowl (Tufted Duck, Goosander)
 Figure 3A-3F: Flight Activity Survey Results, Red Kite (September-February)
 Figure 4: Flight Activity Survey Results, Hen Harrier

Figure 5: Flight Activity Survey Results, Kestrel

Figure 6: Flight Activity Survey Results, Other Raptors and Owls (Merlin, Peregrine, Short-eared Owl)

Figure 7: Flight Activity Survey Results, Waders (Golden Plover, Lapwing, Snipe)

APPENDICES

Appendix 01: Survey dates, times and observers

Appendix 02: Weather data

Appendix 03: Flight activity survey data

1.0 Introduction

1.1 Background

SLR was commissioned by Innogy Renewables UK Ltd (now RWE Renewables UK) in March 2019 to undertake baseline ornithology surveys at the proposed Pen March Wind Farm (the Site).

1.2 Site Description

The Site is located approximately 1km north-east of the suburb of Dowlais Top on the north-eastern fringe of Merthyr Tydfil and 2km north-west of the centre of Rhymney village. The southern boundary of the survey area lies approximately 90m north of the A465 Heads of the Valleys Road. The survey area comprises a broadly sloping area of purple moor grass *Molinia caerulea* dominated grassland, with small, scattered areas of dense scrub, exposed rock, dry heath and standing open water habitats. The survey area rises from approximately 370m above sea level at the southern extent of the survey area (adjacent to the A465 road) up to approximately 530m in the north of the survey area.

The wider landscape around the survey area is typified by grazed moorland habitats, with frequent scattered areas of industrial and residential development to the south, south-east and south-west of the survey area and the Brecon Beacons National Park lying to the north of the survey area.

1.3 Scope of Work

The scope of survey work was based on existing knowledge of the area and took into account current NatureScot (NS) (formerly Scottish Natural Heritage (SNH)) Guidance¹ (which is also applicable in Wales). The scope of survey work undertaken during the 2020-21 non-breeding season is provided in Table 1-1.

Table 1-1
Scope of Ornithological Survey Work, Non-breeding Season 2020-21

Survey Type	Summary Methodology (see Section 2 for further details)
Vantage Point (VP) surveys	Based on 36 hours of survey between September 2020 and March 2021 inclusive, from each of two VPs. Following modelling of areas of potential visibility and taking into consideration likely constraints on the areas in which turbines could be located, two VPs were considered to provide sufficient coverage of possible turbine locations (the developable area) under consideration at the time of survey, plus appropriate buffer zones.

¹ Scottish Natural Heritage (2017). *Recommended Bird Survey Methods to Inform Impact Assessment Of Onshore Wind Farms V2*. Scottish Natural Heritage, Inverness.

1.4 Purpose of this Report

This report outlines the surveys undertaken and methods used. It goes on to summarise the survey data obtained and provides descriptions of the legal and conservation status of the species recorded.

The assessment of impacts resulting from the proposed development and the development of mitigation measures, if required, are beyond the scope of this report and will be covered in a separate Environmental Statement in due course.

1.5 Target Species

Target species for the surveys were defined by legal and/ or conservation status and vulnerability to impacts caused by wind turbines, as defined in NS Guidance¹. Scientific names for all species referred to in this report are given in Section 4.1.

1.5.1 Primary Target Species

All Annex 1² and/ or Schedule 1³ raptor and owl species, including:

- Hen harrier;
- Red kite;
- Merlin;
- Peregrine;
- Kestrel⁴; and
- Short-eared owl.

All wildfowl species excluding feral geese (e.g. Canada goose *Branta canadensis*) and all wader species.

1.5.2 Secondary Target Species

Non-Annex 1 and/ or Schedule 1 raptor species, including:

- Buzzard;
- Sparrowhawk; plus
- Cormorant, gulls, raven and any other non-passerine species of conservation concern (it is generally considered that passerine species are not significantly impacted by wind farms¹).

² Annex 1 of The Birds Directive (Directive 2009/147/EC).

³ Schedule 1 of the Wildlife & Countryside Act 1981 (as amended).

⁴ Kestrel is not listed on Annex 1 or Schedule 1 but was included as a target species due to recent population declines and its potential vulnerability to impacts from wind turbines.

2.0 Survey Methodology

2.1 Survey Areas, Dates and Personnel

Surveys were undertaken by Martyn Owen MCIEEM (MO) and Richard Moores (RM) from BiOME Consulting, both experienced ornithologists working as sub-consultants to SLR Consulting.

Details of survey dates, times and observers are provided in Appendix 01 and a record of weather conditions during surveys is provided in Appendix 02.

2.2 Flight Activity Surveys

36 hours of flight activity surveys were conducted from both VP locations during the 2020-21 non-breeding season (September to March inclusive), as summarised in Table 2-1. The VP locations are shown on Figure 1 along with their associated areas of visibility at 15m above ground level, i.e. the lowest possible rotor swept height (the viewsheds).

In order to avoid possible complications during any subsequent collision risk modelling VP watches were timed such that surveys were not undertaken simultaneously from both VPs.

VP watches aimed to quantify the flight activity of primary and secondary target species (as defined in Section 1.5) within the study area.

The main purpose of VP watches is to collect data on primary target species that will enable estimates to be made of:

- The time spent flying over the site;
- The relative use by birds of different parts of the site; and
- The proportion of flying time spent within the provisional upper and lower risk height limits as determined by the potential rotor diameter and rotor hub height.

For each primary target species observation, the following details were recorded:

- Time of observation;
- Duration of flying bout;
- Species, age and sex (where determinable); and
- Time spent within each height band.

Taking into account the possible dimensions of the turbines likely to be used, the height bands used were as follows:

- 1 = <15m
- 2 = 15-30m
- 3 = 30-150m
- 4 = 150-200m
- 5 = >200m

In addition, a summary of observations of secondary target species was recorded at the end of each five-minute period during VP watches to provide an index of flight activity for secondary target species within the site, in accordance with current NS guidance.

Table 2-1
VP Surveys undertaken at Pen March, Non-breeding Season 2020-2021

VP Number	OS Reference	Grid	Hours of Survey Completed						
			Sept	Oct	Nov	Dec	Jan	Feb	Mar
1	SO 09017 11354		6	6	6	6	6	0	6
2	SO 07915 09699		6	6	6	6	6	6	0

2.3 Survey Limitations

With regard to viewshed coverage, there is an unavoidable gap in the visibility apparent in the centre of the developable area due to the nature of the terrain (Figure 1). Despite this, it is considered that the vantage point data will be representative of the site as a whole and sufficient to inform a robust assessment of the proposed development.

With regard to weather conditions, there were intermittent periods of poor visibility during some surveys. However, these conditions were not persistent through the affected surveys and target species were still recorded. Therefore, these conditions are not considered to be significant limitations to the survey data obtained.

3.0 Survey Results

3.1 Flight Activity Surveys

Flight activity recorded from VP1 and VP2 combined by primary target species is summarised in Table 3-1. Primary target species flights from both VPs are shown on Figures 2, 3A-3F, 4, 5, 6 and 7. Flight activity data are provided in more detail in Appendix 03.

Table 3-1
Number of Primary Target Species Flights from VP1 and VP2 Combined, September 2020 – March 2021

Species	Number of flights by month							Total number of flights	Total number of flights potentially at risk height*	Total number of birds recorded in flight
	September	October	November	December	January	February	March			
Tufted duck	1	1	0	0	0	0	0	2	0	16
Goosander	0	0	1	1	0	0	0	2	1	7
Red kite	10	9	5	8	4	7	0	43	32	44
Hen harrier	1	1	0	0	2	3	1	8	0	8
Kestrel	3	4	1	4	0	2	0	14	1	15
Merlin	0	1	0	0	0	0	0	1	0	1
Peregrine	0	1	0	0	0	0	0	1	1	1
Golden plover	2	0	0	0	1	0	0	3	3	13
Lapwing	0	0	1	0	0	0	1	2	2	36
Snipe	0	1	0	0	0	0	0	1	0	1
Short-eared owl	0	0	0	0	0	2	0	2	0	2
* precautionary risk height assumed to be between 15m – 200m										

3.1.1 Species Accounts

A total of 79 flights by 11 primary target species was recorded between September 2020 and March 2021. A summary description of flight activity by species is presented below:

Tufted duck

Two tufted duck flights totalling 16 birds were recorded at the Jepson's Pond reservoir outside of the developable area. Both flights were below potential collision height, in September and October (Figure 2).

Goosander

Two goosander flights involving 7 birds were recorded close to the Jepson's Pond reservoir outside of the developable area during surveys in November and December (Figure 2). One of the flights was at potential collision risk height.

Red kite

Red kite was the most frequently recorded primary target species during the non-breeding season flight activity surveys. Out of the 43 flights recorded, 32 (74%) were at potential collision risk height. Flights were recorded across the whole of the developable area. Flight lines for September to February are shown on Figures 3A, 3B, 3C, 3D, 3E and 3F. No flights were recorded in March.

Hen harrier

The eight hen harrier flights were distributed through all months other than November and December and involved adult male, female and unsexed birds. Six of the flights were within the developable area but none were at potential collision height. All flight lines are shown on Figure 4.

Kestrel

The 14 kestrel flights were distributed through all months other than January and March and involved adult male and female plus unsexed birds. Flights were recorded across the whole of the developable area but only one was at potential collision height. All kestrel flight lines are shown on Figure 5.

Merlin

One merlin flight was recorded from VP2 on 13 October, involving an adult male hunting around the western periphery of the developable area below potential risk height (Figure 6).

Peregrine

One peregrine flight was recorded from VP1 on 14 October, involving an adult male hunting around the south-eastern periphery of the site at potential risk height (Figure 6).

Golden plover

The three golden plover flights involved small numbers (totalling 13 birds) passing through the site in September and January (Figure 7). All three flights were observed at potential collision height.

Lapwing

The two lapwing flights involved 1) a flock of 30 birds outside of the developable area near Jepson's Pond on 25 November; and 2) a flock of 6 birds crossing the southern part of the developable area on 12 March. Both flights were at potential collision height. The lapwing flight lines are shown on Figure 7.

Snipe

One very brief flight (duration 6 seconds) was recorded from VP2 on 13 October (Figure 7). This flight was below potential risk height.

Short-eared owl

Two flights, both by the same hunting bird, were recorded from VP2 on 15 February (Figure 6). Together, the flights were 24 seconds in duration and were below potential collision height.

3.1.2 Secondary Target Species

Seven secondary species were recorded, as follows in order of frequency:

- Buzzard; recorded in all months other than March. Recorded in 40 five-minute periods, with a maximum of only one bird at any one time.
- Raven; recorded in all months other than February. Recorded in 24 five-minute periods, with a maximum of four birds at any one time.
- Herring gull; recorded occasionally roosting on Jepson's Pond. Recorded in three five-minute periods, with a maximum 10 birds on 9 December.

- Cormorant; single bird recorded on two occasions, presumably commuting to/ from a roost.
- Black-headed gull; recorded in one five-minute period, with a maximum of 7 birds at roost on Jepson's Pond on 9 December.
- Common gull; recorded in one five-minute period, with a maximum of 12 birds at roost on Jepson's Pond on 9 December.
- Lesser black-backed gull; one bird passing over site on 12 March.
- In addition, a notable flock of 300 starlings was recorded on 12 March, recorded in the site and adjacent fields.

4.0 Summary and Conclusions

Flight activity (VP) surveys were carried out at the proposed Pen March Wind Farm during the 2020-21 non-breeding season.

The following primary target species were recorded during flight activity surveys:

- Tufted duck;
- Goosander;
- Red kite;
- Hen harrier;
- Kestrel;
- Merlin;
- Peregrine;
- Golden plover;
- Lapwing;
- Snipe; and
- Short-eared owl.

The most frequent flight activity was by red kite (43 flights recorded), with other target species activity less frequent. Other than kestrel (14 flights) and hen harrier (8 flights) all other target species were recorded three times or less.

A comparison with the survey results from the 2019-20 non-breeding season shows that the following species were seen in both winters:

- Tufted duck;
- Goosander;
- Red kite;
- Hen harrier;
- Kestrel;
- Peregrine; and
- Golden plover.

Flight activity was noticeably higher in 2020-21 by red kite (19 flights in 2019-20 compared with 43 flights in 2020-21) and kestrel (two flights in 2019-20 compared with 14 flights in 2020-21); but was fairly similar for other target species.

4.1 Legal and Conservation Status of Target Species Recorded

Table 4-1 summarises the legal and conservation status of the target species recorded during the flight activity surveys.

Table 4-1
Legal and Conservation Status of Primary and Secondary Target Species

Species	Legal & Conservation Status in Wales
Goosander <i>Mergus merganser</i>	General WCA; BoCC4 Green; BoCCW3 Green
Tufted duck <i>Aythya fuligula</i>	General WCA; BoCC4 Amber; BoCCW3 Green
Red kite <i>Milvus milvus</i>	Schedule 1 & 1A; Annex 1; BoCC4 Amber; BoCCW3 Amber
Hen harrier <i>Circus cyaneus</i>	Schedule 1 & 1A; Annex 1; BoCC4 Red; BoCCW3 Red; Sec7
Merlin <i>Falco columbarius</i>	Schedule 1; BoCC4 Red; BoCCW3 Green
Kestrel <i>Falco tinnunculus</i>	General WCA; BoCC4 Amber; BoCCW3 Green; Sec7
Peregrine <i>Falco peregrinus</i>	Schedule 1; Annex 1; BoCC4 Green; BoCCW3 Green
Golden plover <i>Pluvialis apricaria</i>	General WCA; Annex 1; BoCC4 Green; BoCCW3 Red; Sec7
Lapwing <i>Vanellus vanellus</i>	General WCA; BoCC4 Red; BoCCW3 Red; Sec7
Snipe <i>Gallinago gallinago</i>	General WCA; BoCC4 Amber; BoCCW3 Amber
Short-eared owl <i>Asio flammeus</i>	General WCA; Annex 1; BoCC4 Amber; BoCCW3 Red
Buzzard <i>Buteo buteo</i>	General WCA; BoCC4 Green; BoCCW3 Green
Cormorant <i>Phalacrocorax carbo</i>	General WCA; BoCC4 Green; BoCCW3 Green
Black-headed gull <i>Chroicocephalus ridibundus</i>	General WCA; BoCC4 Amber; BoCCW3 Red; Sec 7
Common gull <i>Larus canus</i>	General WCA; BoCC4 Amber; BoCCW3 Green
Herring gull <i>Larus argentatus</i>	General WCA; BoCC4 Red; BoCCW3 Red; Sec7
Lesser black-backed gull <i>Larus fuscus</i>	General WCA; BoCC4 Amber; BoCCW3 Green
Key	Annex 1 - the species is listed in Annex 1 of the EC Birds Directive; General WCA - the species is afforded general protection by the Wildlife and Countryside Act 1981 (as amended); Schedule 1 & 1A - the species is listed in Schedule 1 or 1A of the Wildlife and Countryside Act 1981 (as amended);

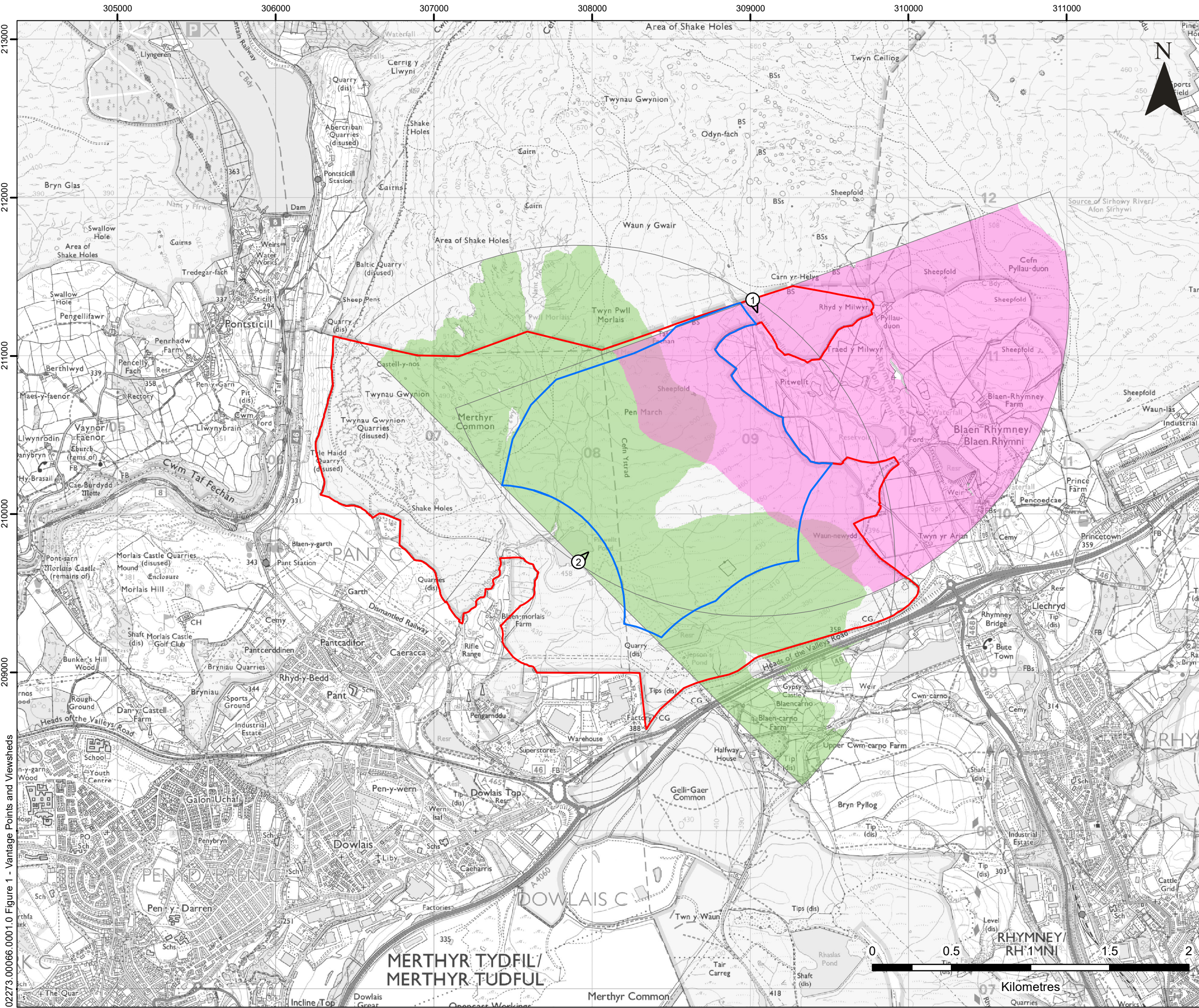
Species	Legal & Conservation Status in Wales
	BoCC4 status (green, amber or red) – indicates the current Birds of Conservation Concern status category⁵; BoCCW3 status (green, amber or red) – indicates the current Birds of Conservation Concern Wales status category⁶; and Sec7 – listed as a priority species in terms of biodiversity in Wales (Section 7 of the Environment Act)⁷.

⁵ Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708–746.

⁶ https://www.rspb.org.uk/globalassets/downloads/documents/wales/state-of-birds-wales-2018_bilingual.pdf

⁷ <https://www.biodiversitywales.org.uk/Environment-Wales-Act/>

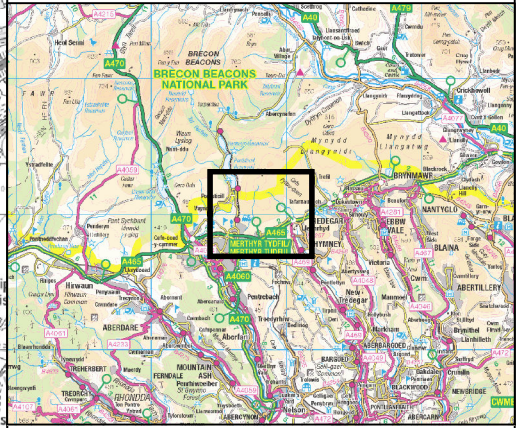
FIGURES



LEGEND

- Site Boundary
- Developable Area
- Vantage Point
- Area Visible from VP01
- Area Visible from VP02

Note
Visibility has been shown from 15m
(the lowest possible rotor swept height)



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

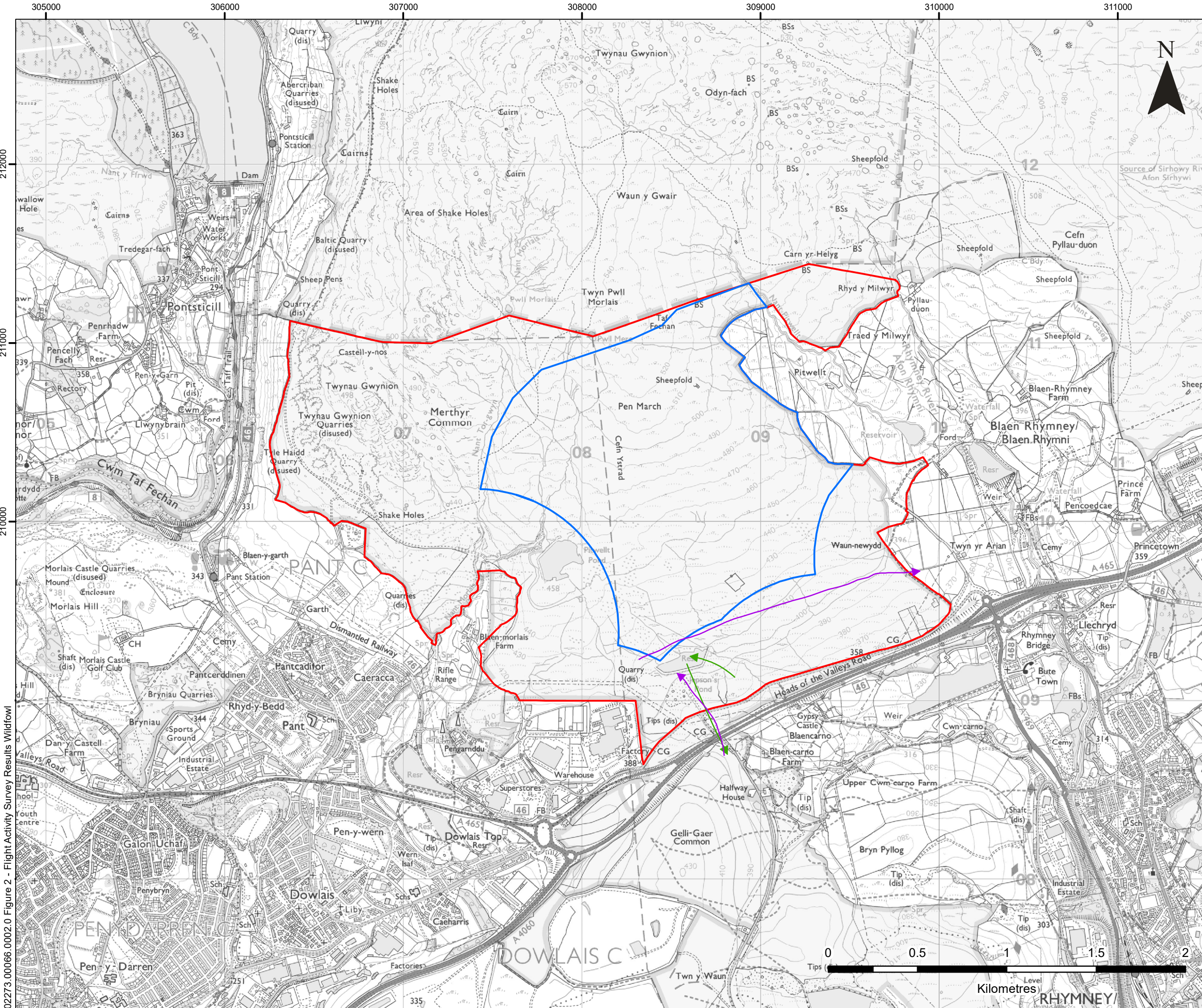
**VANTAGE POINTS
AND VIEWSHEDS**

1

Scale 1:22,500 @ A3

Date APRIL 2021

02273.00066.0001.0 Figure 1 - Vantage Points and Viewsheds



LEGEND

Site Boundary

Developable Area

Species Name

Goosander

Tufted Duck

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

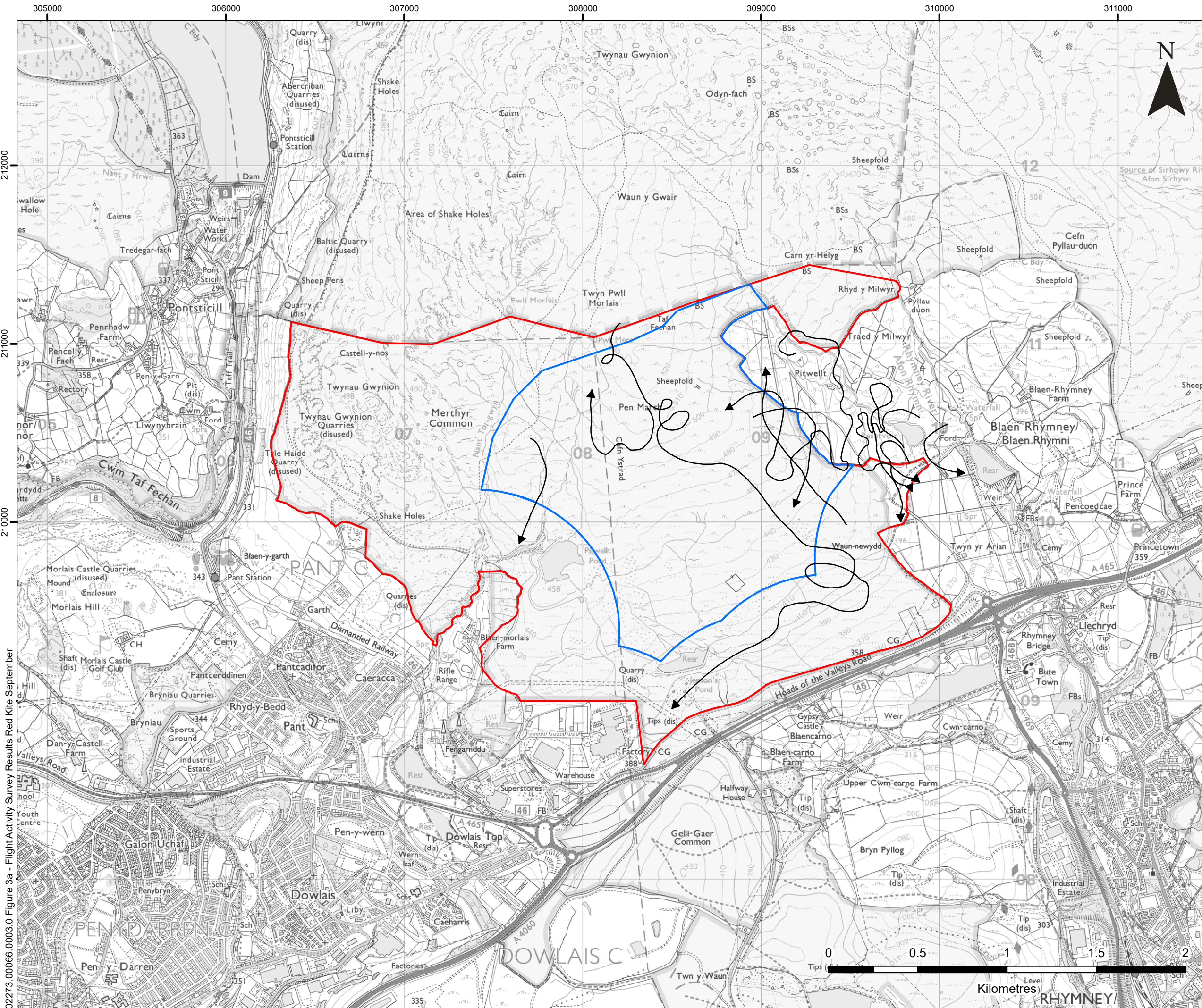
NON-BREEDING SEASON
BIRD SURVEYS 2020-21

FLIGHT ACTIVITY SURVEY RESULTS
WILDFOWL

2

Scale 1:20,000 @ A3

Date APRIL 2021



LEGEND

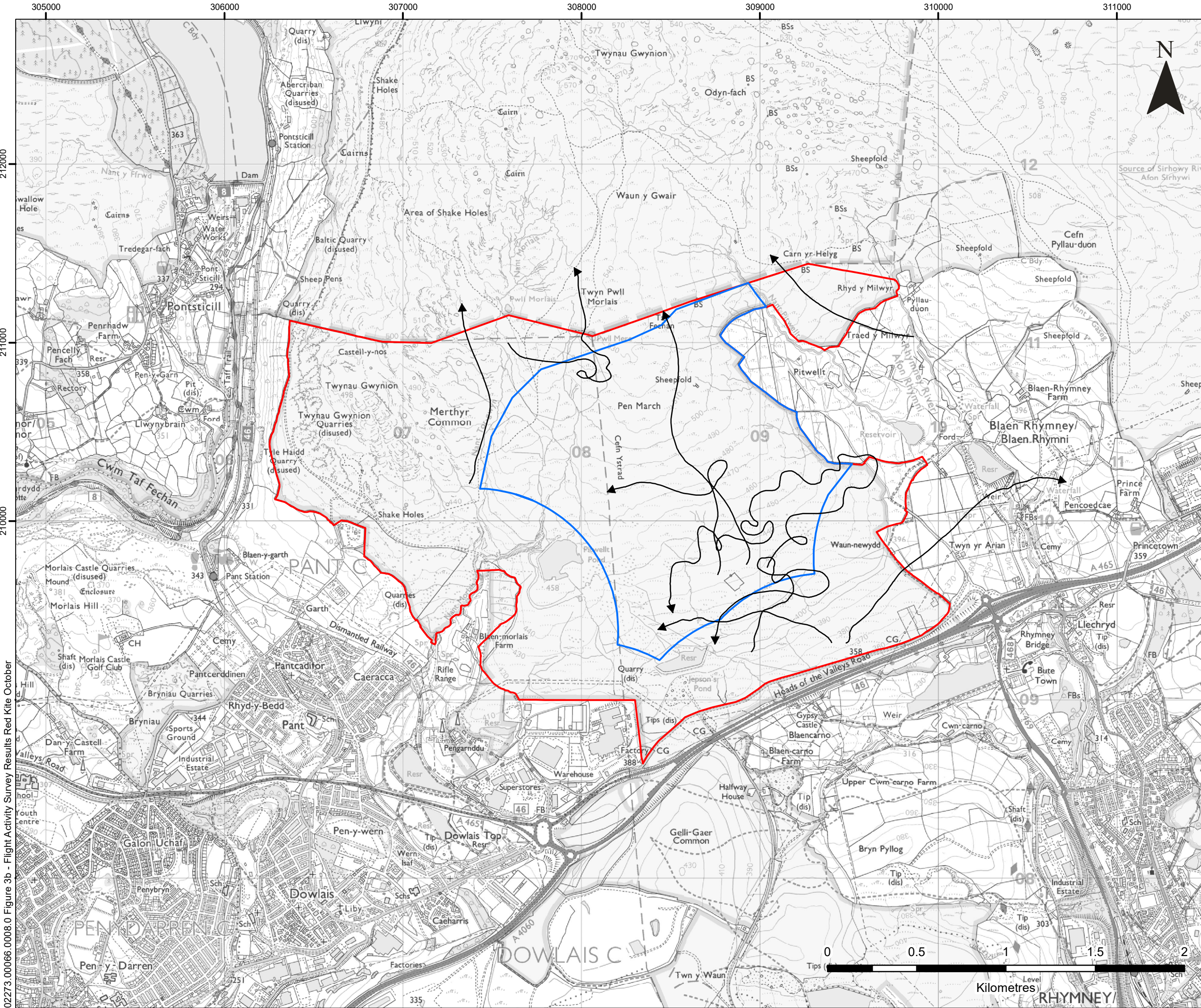
- Site Boundary
- Developable Area
- Directional Flight Line

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM
NON-BREEDING SEASON
BIRD SURVEYS 2020-21
FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - SEPTEMBER

3a

Scale 1:20,000 @ A3 Date APRIL 2021



LEGEND

- Site Boundary
- Developable Area
- Directional Flight Line

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

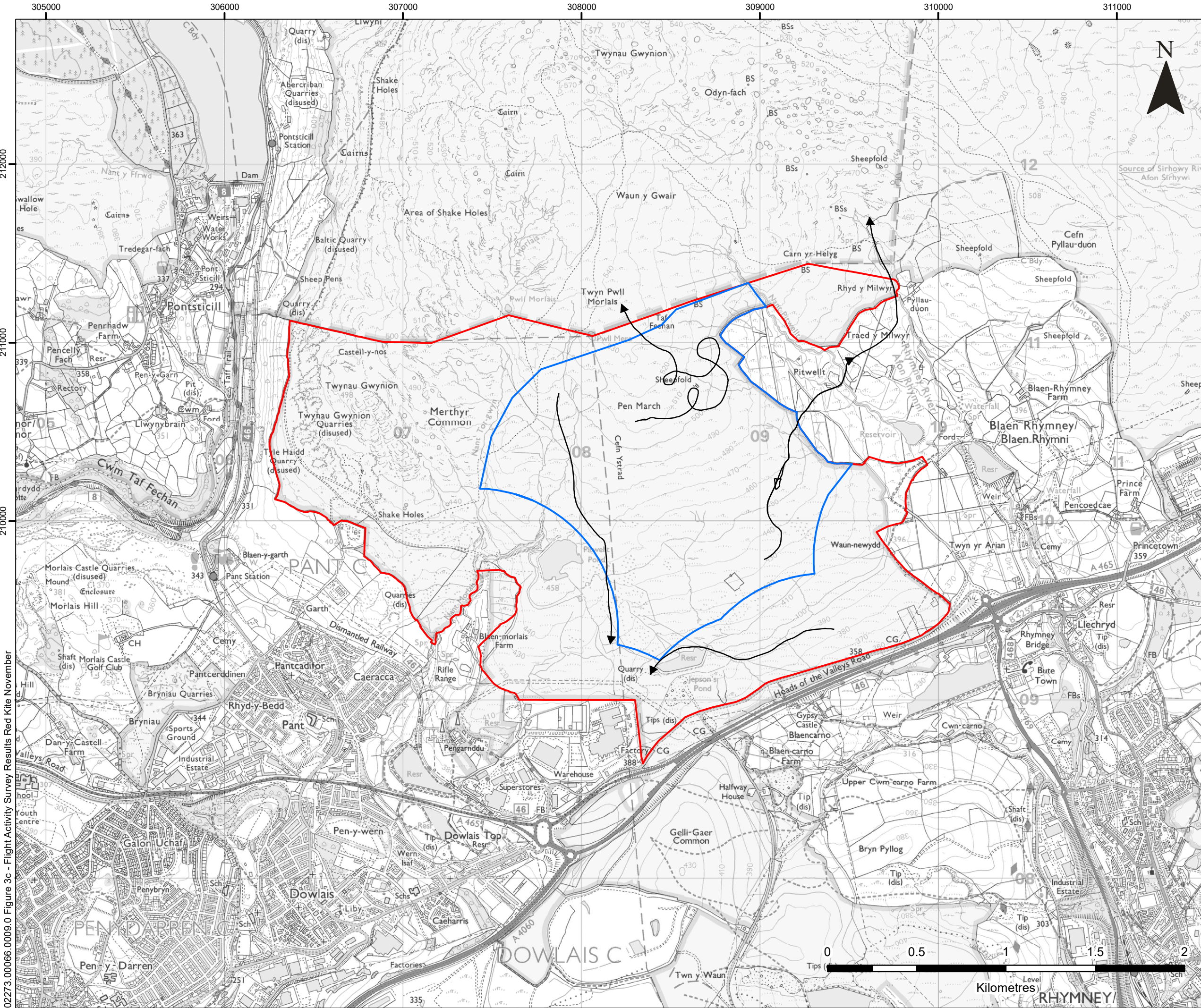
PEN MARCH WIND FARM

**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - OCTOBER**

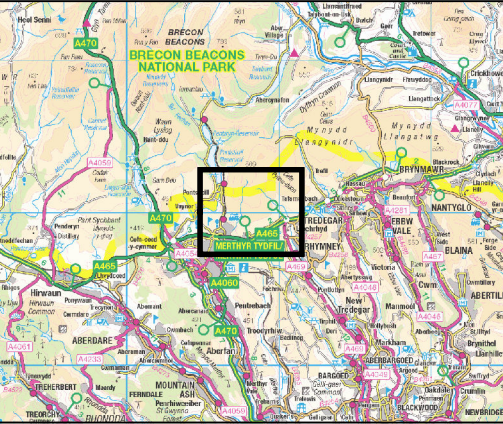
3b

Scale 1:20,000 @ A3 Date APRIL 2021



LEGEND

-  Site Boundary
-  Developable Area
-  Directional Flight Line







4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

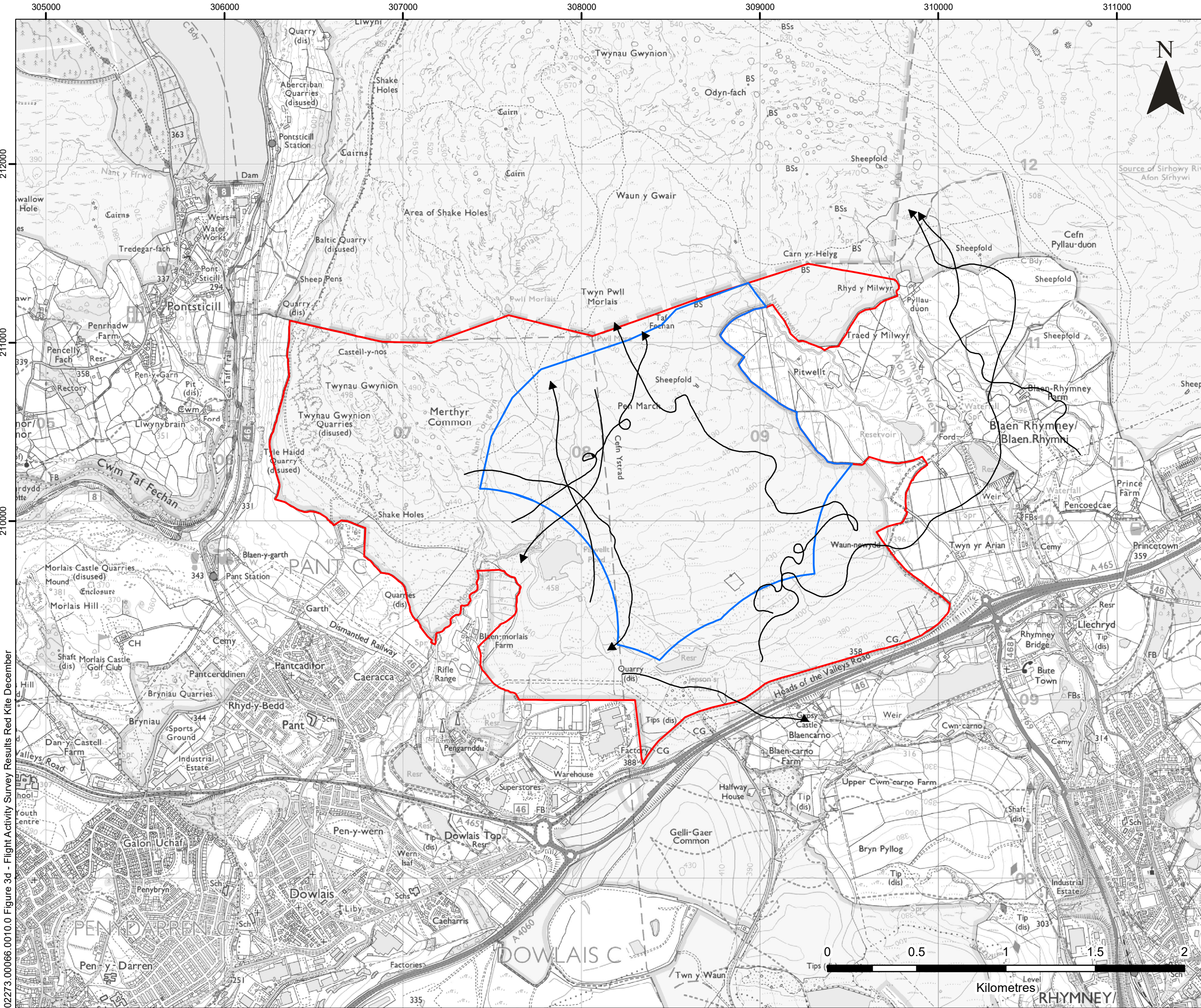
**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - NOVEMBER**

3c

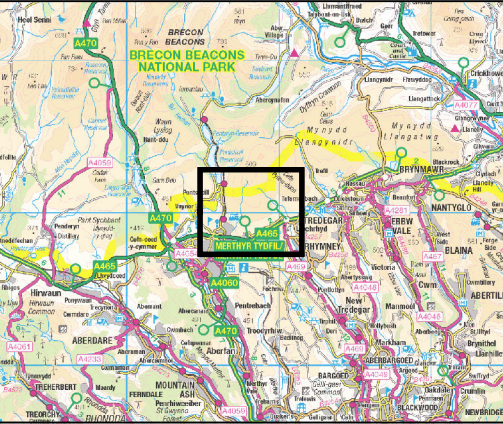
Scale
1:20,000 @ A3

Date
APRIL 2021



LEGEND

-  Site Boundary
-  Developable Area
-  Directional Flight Line







4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

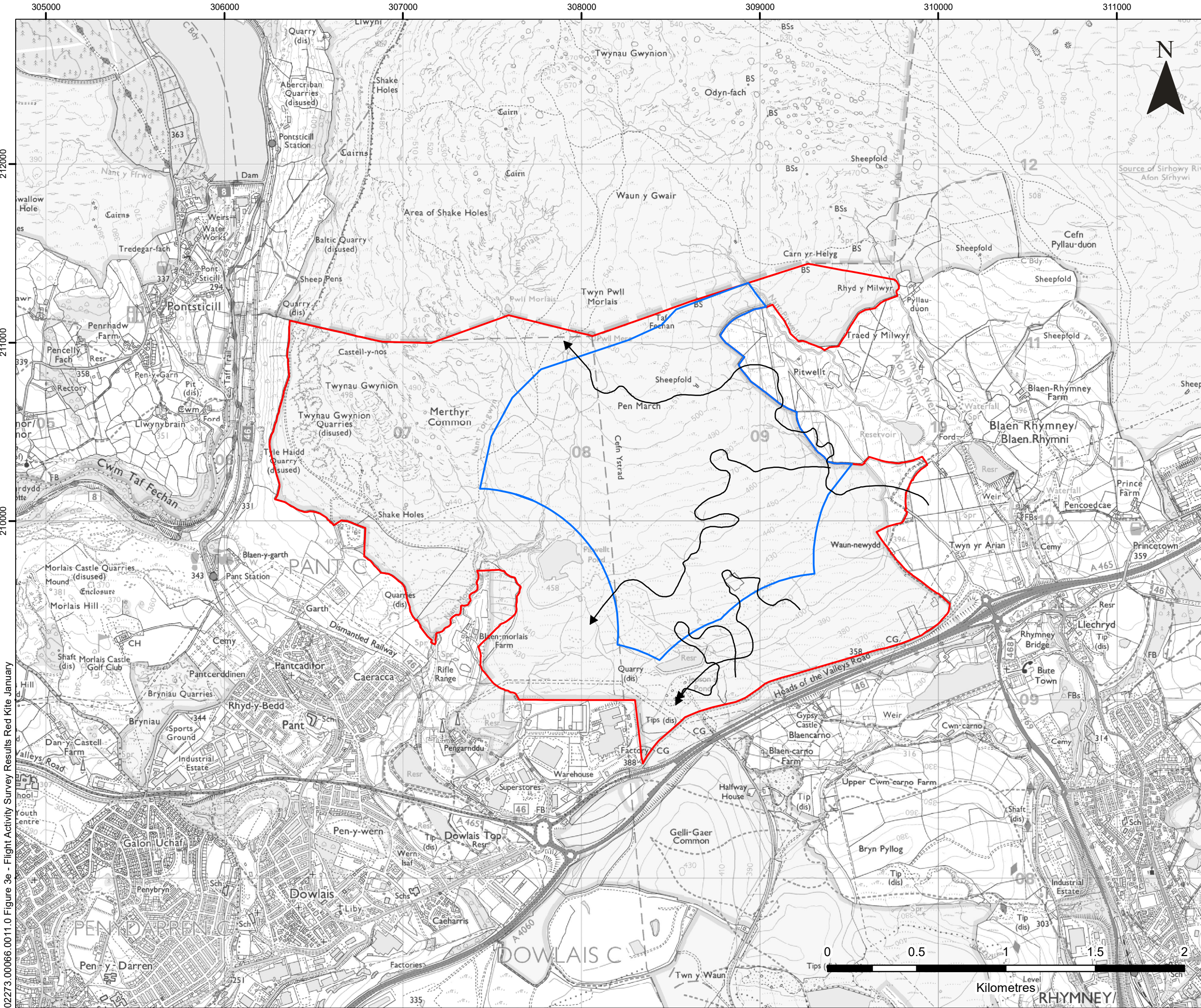
**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - DECEMBER**

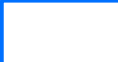
3d

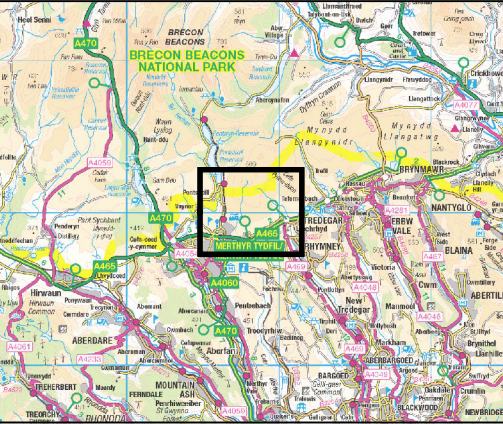
Scale 1:20,000 @ A3

Date APRIL 2021



LEGEND

-  Site Boundary
-  Developable Area
-  Directional Flight Line







4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

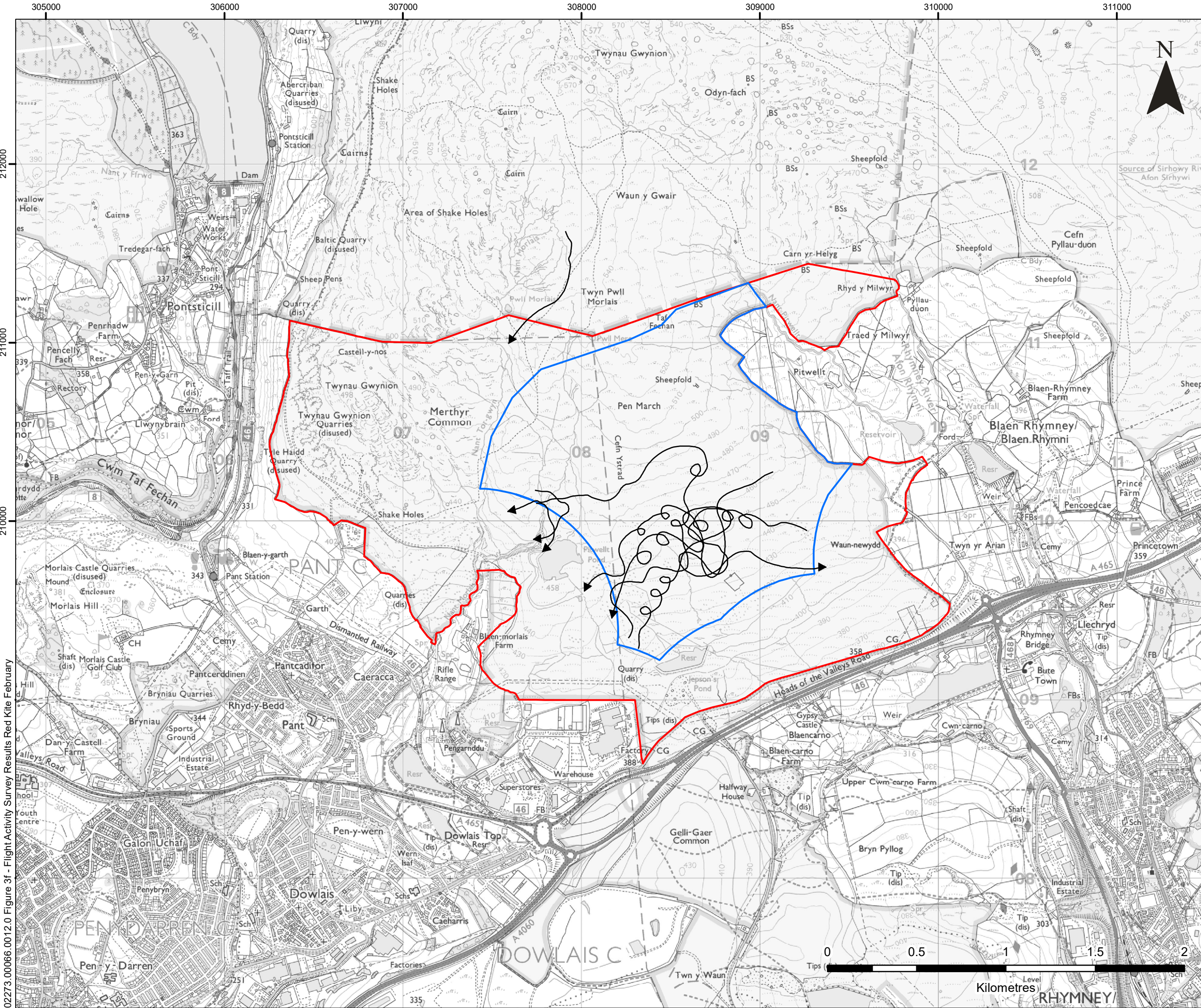
**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - JANUARY**

3e

Scale
1:20,000 @ A3

Date
MAY 2021



LEGEND

- Site Boundary
- Developable Area
- Directional Flight Line

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

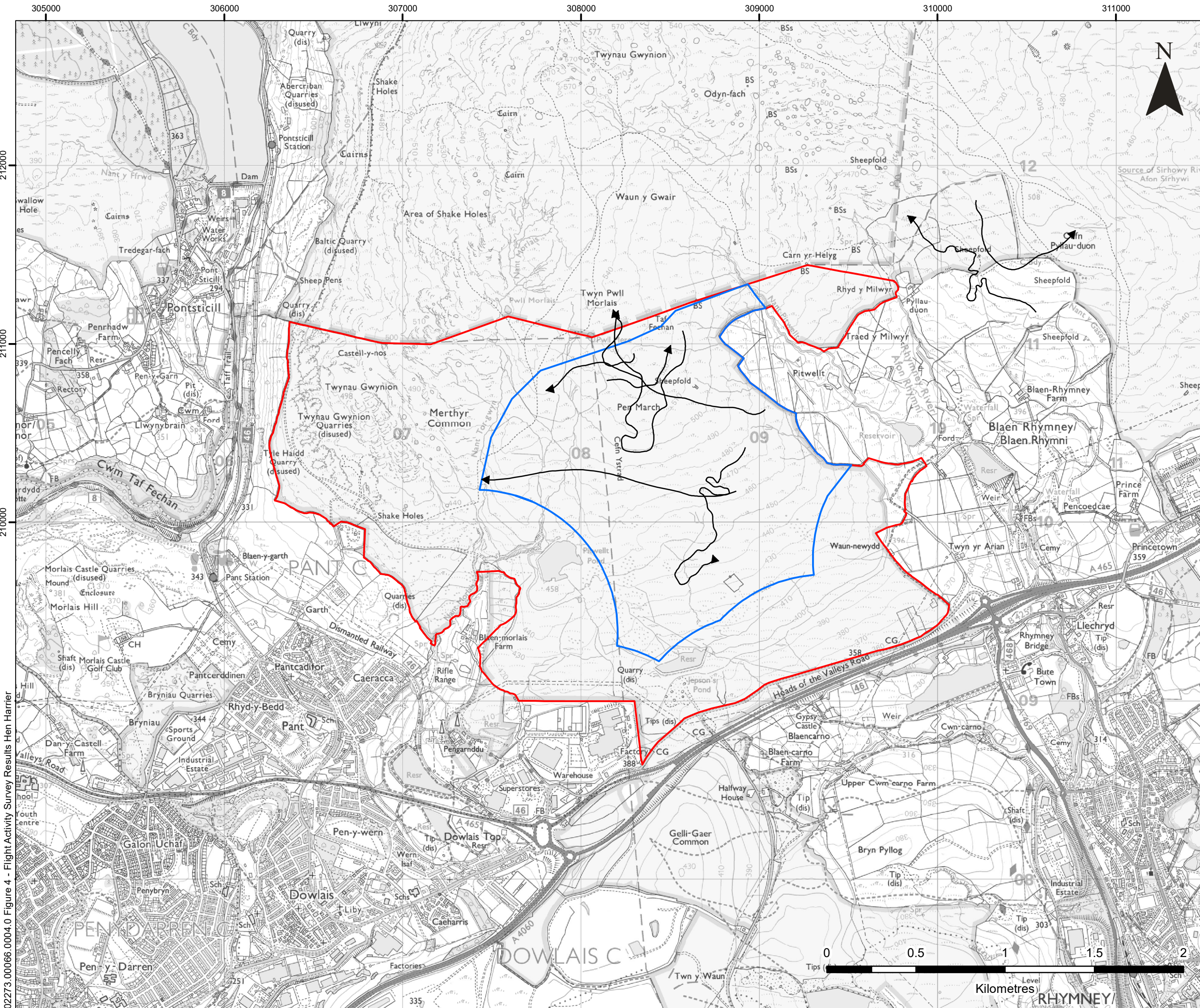
PEN MARCH WIND FARM

**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
RED KITE - FEBRUARY**

3f

Scale 1:20,000 @ A3 Date MAY 2021



LEGEND

- Site Boundary
- Developable Area
- Directional Flight Line

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

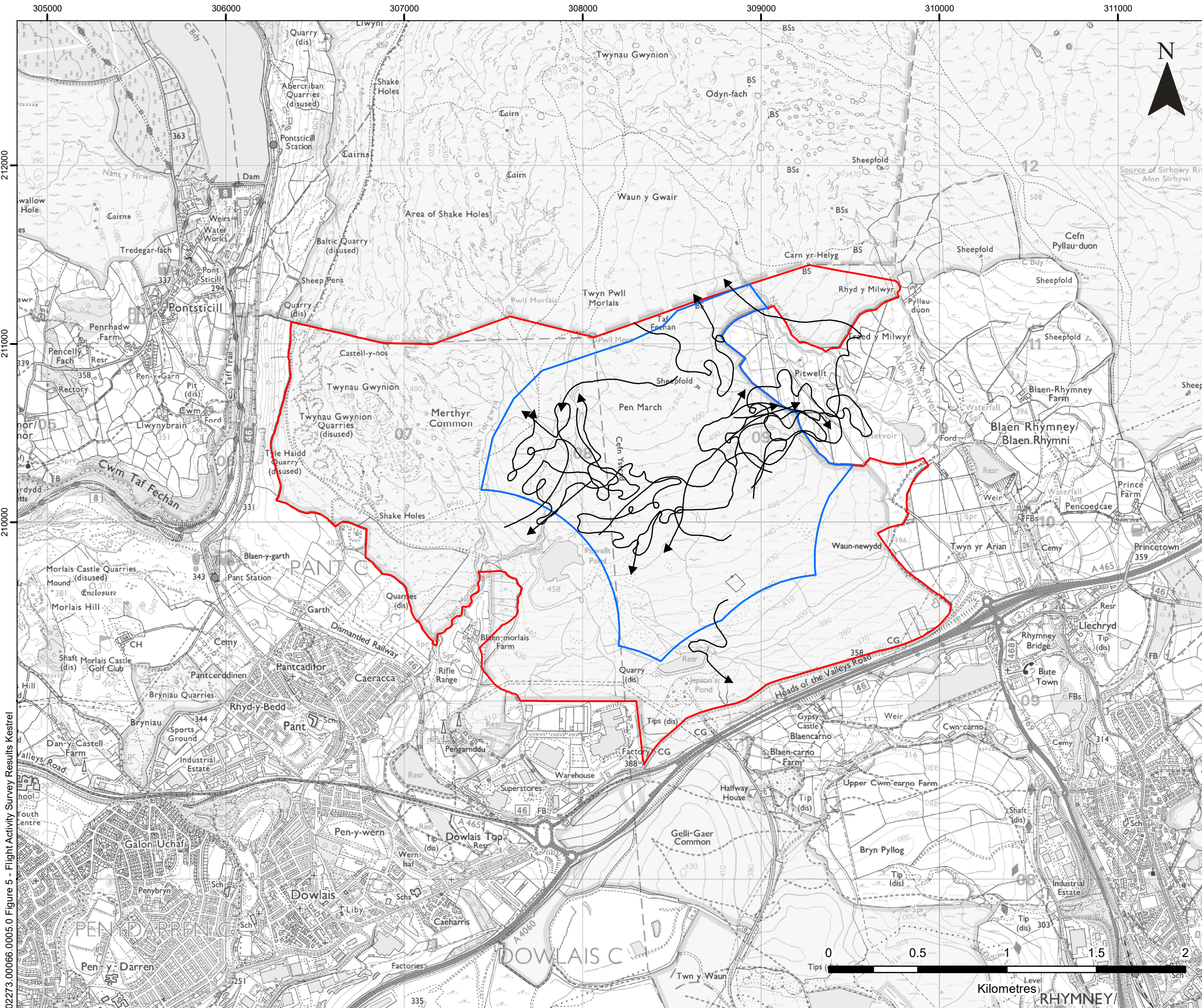
PEN MARCH WIND FARM

**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
HEN HARRIER**

4

Scale 1:20,000 @ A3 Date APRIL 2021



LEGEND

- Site Boundary
- Developable Area
- Directional Flight Line

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

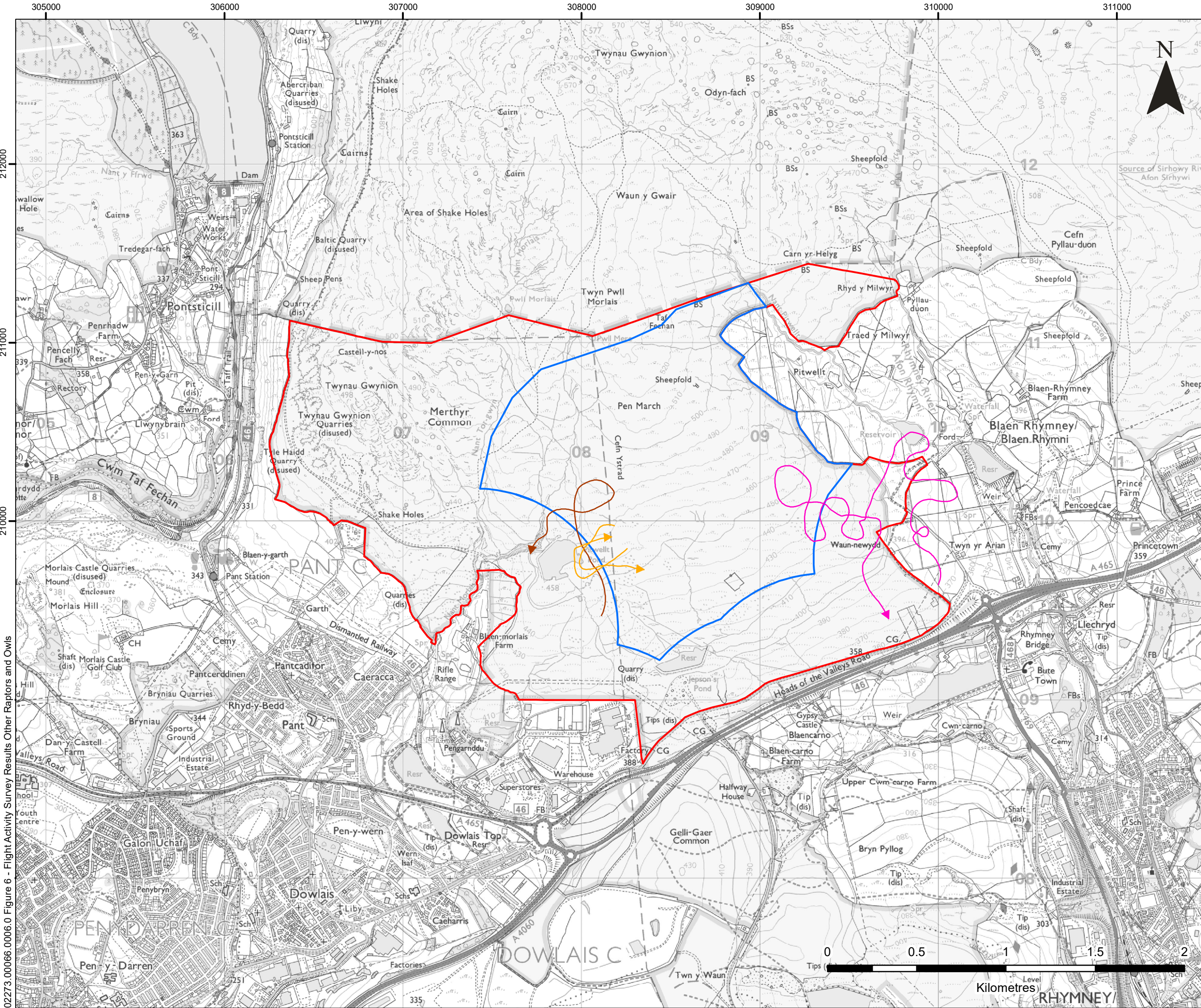
**NON-BREEDING SEASON
BIRD SURVEYS 2020-21**

**FLIGHT ACTIVITY SURVEY RESULTS
KESTREL**

5

Scale
1:20,000 @ A3

Date
APRIL 2021



LEGEND

Site Boundary

Developable

Species Name

Merlin

Peregrine

Short-Eared Owl

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

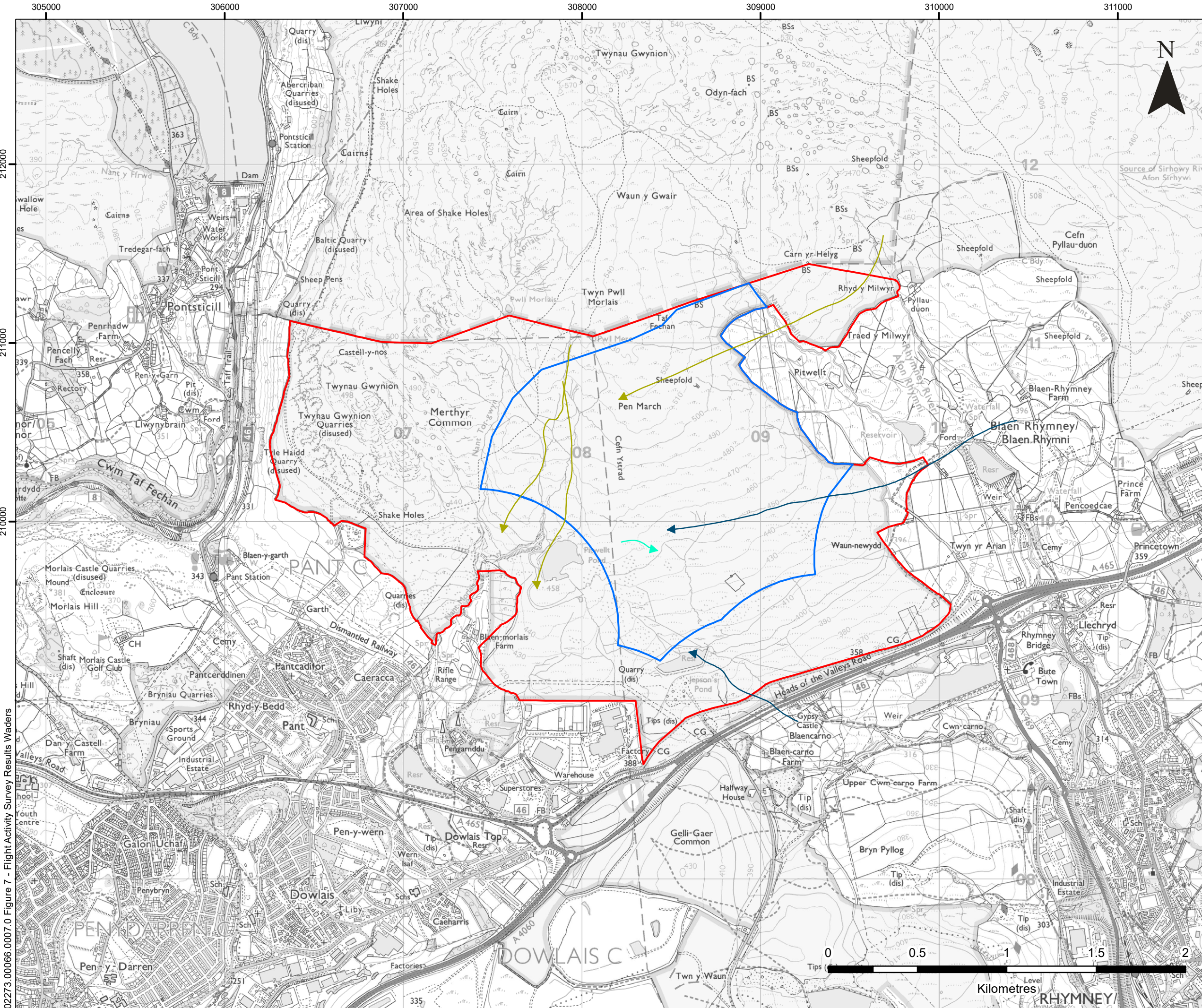
NON-BREEDING SEASON
BIRD SURVEYS 2020-21

FLIGHT ACTIVITY SURVEY RESULTS
OTHER RAPTORS AND OWLS

6

Scale 1:20,000 @ A3 Date APRIL 2021

02273.00066.0006.0 Figure 6 - Flight Activity Survey Results Other Raptors and Owls



LEGEND

Site Boundary

Developable

Species Name

Golden Plover

Lapwing

Snipe

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

PEN MARCH WIND FARM

NON-BREEDING SEASON
BIRD SURVEYS 2020-21

FLIGHT ACTIVITY SURVEY RESULTS
WADERS

7

Scale 1:20,000 @ A3

Date APRIL 2021

APPENDIX 01

Survey dates, times and observers

Table A1-1
Details of VP surveys undertaken from Vantage Point 1

Date	Start Time	End Time	No. Hours	Surveyor
08/09/2020	10:45	13:45	03:00	RM
08/09/2020	14:45	17:45	03:00	RM
14/10/2020	11:30	14:30	03:00	RM
14/10/2020	15:30	18:30	03:00	RM
26/11/2020	08:50	11:50	03:00	RM
26/11/2020	12:50	15:50	03:00	RM
10/12/2020	09:15	12:15	03:00	RM
10/12/2020	13:15	16:15	03:00	RM
29/01/2021	07:50	10:50	03:00	RM
29/01/2021	14:00	17:00	03:00	RM
12/03/2021	09:45	12:45	03:00	MO
12/03/2021	13:15	16:15	03:00	MO

Table A1-2
Details of VP surveys undertaken from Vantage Point 2

Date	Start Time	End Time	No. Hours	Surveyor
09/09/2020	10:00	13:00	03:00	RM
09/09/2020	14:00	17:00	03:00	RM
13/10/2020	07:40	10:40	03:00	RM
13/10/2020	11:40	14:40	03:00	RM
25/11/2020	08:40	11:40	03:00	RM
25/11/2020	12:40	15:40	03:00	RM
09/12/2020	09:15	12:15	03:00	RM
09/12/2020	13:15	16:15	03:00	RM
28/01/2021	07:55	10:55	03:00	RM
28/01/2021	14:10	17:10	03:00	RM

Date	Start Time	End Time	No. Hours	Surveyor
15/02/2021	10:05	13:05	03:00	MO
15/02/2021	13:35	16:35	03:00	MO

APPENDIX 02

Weather Data

Table A2-1
Weather data collected during flight activity surveys undertaken at VP1

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°c)
08/09/2020	10:45	13:45	1	3	WSW	0	8	1	1	0	0	16
08/09/2020	10:45	13:45	2	3	WSW	0	7	1	1	0	0	16
08/09/2020	10:45	13:45	3	3	WSW	0	8	1	1	0	0	17
08/09/2020	14:45	17:45	1	4	WSW	0	8	1	0	0	0	17
08/09/2020	14:45	17:45	2	4	WSW	0	8	1	1	0	0	17
08/09/2020	14:45	17:45	3	4	WSW	0	8	1	1	0	0	16
14/10/2020	11:30	14:30	1	2	NE	0	8	1	2	0	0	9
14/10/2020	11:30	14:30	2	2	NE	0	8	1	2	0	0	9
14/10/2020	11:30	14:30	3	3	NE	0	8	1	2	0	0	10
14/10/2020	15:30	18:30	1	3	NE	0	6	1	2	0	0	10
14/10/2020	15:30	18:30	2	3	NE	0	6	1	2	0	0	9
14/10/2020	15:30	18:30	3	3	NE	0	7	1	2	0	0	8
26/11/2020	08:50	11:50	1	1	NE	0	0		2	0	0	3
26/11/2020	08:50	11:50	2	1	NE	0	0		2	0	0	5
26/11/2020	08:50	11:50	3	1	NE	0	1	2	2	0	0	6
26/11/2020	12:50	15:50	1	1	NE	0	1	2	2	0	0	7
26/11/2020	12:50	15:50	2	1	NE	0	2	2	2	0	0	6
26/11/2020	12:50	15:50	3	1	NE	0	3	2	2	0	0	5

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°c)
10/12/2020	09:15	12:15	1	3	SE	1	8	1	1	0	0	6
10/12/2020	09:15	12:15	2	3	SE	0	8	1	1	0	0	6
10/12/2020	09:15	12:15	3	3	SE	0	8	1	1	0	0	6
10/12/2020	13:15	16:15	1	3	S	0	8	1	1	0	0	6
10/12/2020	13:15	16:15	2	3	S	1	8	1	1	0	0	5
10/12/2020	13:15	16:15	3	3	S	0	8	1	1	0	0	5
29/01/2021	07:50	10:50	1	5	NW	2	8	1	1	0	0	4
29/01/2021	07:50	10:50	2	5	NW	2	8	0	0	0	0	4
29/01/2021	07:50	10:50	3	5	NW	2	8	0	1	0	0	5
29/01/2021	14:00	17:00	1	5	NW	1	7	1	2	0	0	7
29/01/2021	14:00	17:00	2	5	NW	1	7	1	2	0	0	6
29/01/2021	14:00	17:00	3	5	WNW	1	8	1	2	0	0	6
12/03/2021	09:45	12:45	1	5	SW	1	8	2	2	0	0	8
12/03/2021	09:45	12:45	2	5	SW	1	8	2	2	0	0	9
12/03/2021	09:45	12:45	3	5	SW	0	8	2	2	0	0	9
12/03/2021	13:15	16:15	1	5	SW	1	7	2	2	0	0	9
12/03/2021	13:15	16:15	2	5	SW	0	7	2	2	0	0	8
12/03/2021	13:15	16:15	3	4	SW	0	8	2	2	0	0	8
Rain/ Precipitation		Cloud Cover			Visibility			Lying Snow			Frost	
None 0		Expressed in oktas (n/8)			Poor (<1km) 0			None 0			None 0	
Drizzle 1		Cloud Height			Moderate (1-3km) 1			On site 1			Ground 1	
Light showers/snow 2		Height of cloud above average height of viewshed			Good (>3km) 2			On higher ground 2			All day 2	

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°c)
Heavy showers/snow 3		<150m	0									
Heavy rain/snow 4		150-500m	1									
		>500m	2									

Table A2-2
Weather data from flight activity surveys undertaken at VP2

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°c)
09/09/2020	10:00	13:00	1	4	W	0	8	1	2	0	0	15
09/09/2020	10:00	13:00	2	3	W	2	8	1	2	0	0	14
09/09/2020	10:00	13:00	3	3	W	0	6	2	2	0	0	16
09/09/2020	14:00	17:00	1	2	W	0	4	2	2	0	0	17
09/09/2020	14:00	17:00	2	3	WNW	0	2	2	2	0	0	18
09/09/2020	14:00	17:00	3	2	WNW	0	1	2	2	0	0	
13/10/2020	07:40	10:40	1	1	NW	2	7	1	2	0	0	6
13/10/2020	07:40	10:40	2	3	NW	0	5	1	2	0	0	5
13/10/2020	07:40	10:40	3	3	NW	0	6	1	2	0	0	6

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°C)
13/10/2020	11:40	14:40	1	3	NW	0	7	1	2	0	0	7
13/10/2020	11:40	14:40	2	2	N	0	5	1	2	0	0	8
13/10/2020	11:40	14:40	3	3	N	0	6	1	2	0	0	8
25/11/2020	08:40	11:40	1	4	NW	0	7	2	2	0	0	5
25/11/2020	08:40	11:40	2	4	NW	0	5	2	2	0	0	5
25/11/2020	08:40	11:40	3	3	NW	0	3	2	2	0	0	6
25/11/2020	12:40	15:40	1	3	NW	0	4	2	2	0	0	6
25/11/2020	12:40	15:40	2	2	NW	0	5	2	2	0	0	7
25/11/2020	12:40	15:40	3	2	NNW	0	4	2	2	0	0	6
09/12/2020	09:15	12:15	1	0		0	8	2	2	0	0	4
09/12/2020	09:15	12:15	2	0		0	8	2	2	0	0	3
09/12/2020	09:15	12:15	3	1	SW	0	8	2	2	0	0	3
09/12/2020	13:15	16:15	1	2	S	0	8	2	2	0	0	3

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°C)
09/12/2020	13:15	16:15	2	2	S	0	8	2	2	0	0	3
09/12/2020	13:15	16:15	3	3	S	0	8	2	2	0	0	3
28/01/2021	07:55	10:55	1	4	W	2	8	1	1	0	0	6
28/01/2021	07:55	10:55	2	4	WSW	2	8	1	0	0	0	6
28/01/2021	07:55	10:55	3	4	WSW	2	8	1	1	0	0	7
28/01/2021	14:10	17:10	1	4	W	1	8	0	0	0	0	7
28/01/2021	14:10	17:10	2	4	W	1	8	0	1	0	0	6
28/01/2021	14:10	17:10	3	4	W	1	8	1	1	0	0	6
15/02/2021	10:05	13:05	1	4	SW	0	8	2	2	0	0	9
15/02/2021	10:05	13:05	2	4	SW	0	8	2	2	0	0	9
15/02/2021	10:05	13:05	3	3	SW	0	8	2	2	0	0	9
15/02/2021	13:35	16:35	1	3	SW	0	8	2	2	0	0	9
15/02/2021	13:35	16:35	2	4	SW	0	8	2	2	0	0	8

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°c)
15/02/2021	13:35	16:35	3	4	SW	0	8	2	2	0	0	8
Rain/ Precipitation None 0 Drizzle 1 Light showers/snow 2 Heavy showers/snow 3 Heavy rain/snow 4			Cloud Cover Expressed in oktas (n/8) Cloud Height Height of cloud above average height of viewshed <150m 0 150-500m 1 >500m 2		Visibility Poor (<1km) 0 Moderate (1-3km) 1 Good (>3km) 2			Lying Snow None 0 On site 1 On higher ground 2		Frost None 0 Ground 1 All day 2		

APPENDIX 03

Flight activity survey data

Date	VP_code	Surveyor	FlightID	Species	NumBirds	ObsTime	Time at risk height (s)
08/09/2020	1	RM	1.114.1.1	KT	1	10:56	12
08/09/2020	1	RM	1.114.2.1	KT	1	11:14	40
08/09/2020	1	RM	1.114.3.1	GP	1	12:21	10
08/09/2020	1	RM	1.114.4.1	KT	1	12:38	23
08/09/2020	1	RM	1.114.5.1	KT	1	13:11	79
08/09/2020	1	RM	1.115.1.1	KT	1	16:10	0
08/09/2020	1	RM	1.115.2.1	KT	1	16:48	19
14/10/2020	1	RM	1.120.1.1	KT	1	11:32	97
14/10/2020	1	RM	1.120.2.1	PE	1	11:38	210
14/10/2020	1	RM	1.120.3.1	K.	1	11:46	0
14/10/2020	1	RM	1.120.4.1	KT	1	11:51	130
14/10/2020	1	RM	1.120.5.1	K.	1	11:56	0
14/10/2020	1	RM	1.120.6.1	KT	1	12:51	125
14/10/2020	1	RM	1.120.7.1	KT	1	13:23	0
14/10/2020	1	RM	1.120.8.1	KT	1	13:41	0
14/10/2020	1	RM	1.121.1.1	KT	1	15:48	105

Date	VP_code	Surveyor	FlightID	Species	NumBirds	ObsTime	Time at risk height (s)
14/10/2020	1	RM	1.121.2.1	KT	1	16:38	150
26/11/2020	1	RM	1.124.1.1	KT	1	09:52	0
26/11/2020	1	RM	1.124.2.1	KT	1	10:11	0
26/11/2020	1	RM	1.125.1.1	KT	2	13:16	155
26/11/2020	1	RM	1.125.2.1	K.	1	14:21	0
10/12/2020	1	RM	1.128.1.1	K.	1	10:23	0
10/12/2020	1	RM	1.128.2.1	K.	1	10:49	0
10/12/2020	1	RM	1.128.3.1	KT	1	11:43	228
10/12/2020	1	RM	1.129.1.1	KT	1	13:27	152
10/12/2020	1	RM	1.129.2.1	KT	1	14:06	199
29/01/2021	1	RM	1.132.1.1	HH	1	08:46	0
29/01/2021	1	RM	1.132.2.1	KT	1	10:10	0
12/03/2021	1	MO	1.136.1.1	HH	1	10:12	0
12/03/2021	1	MO	1.136.2.1	L.	6		15
09/09/2020	2	RM	2.116.1.1	TU	2	11:30	0
09/09/2020	2	RM	2.116.2.1	HH	1	12:23	0
09/09/2020	2	RM	2.116.3.1	KT	1	12:26	220

Date	VP_code	Surveyor	FlightID	Species	NumBirds	ObsTime	Time at risk height (s)
09/09/2020	2	RM	2.116.4.1	K.	1	12:32	0
09/09/2020	2	RM	2.116.7.1	GP	4	12:51	80
09/09/2020	2	RM	2.116.8.1	KT	1	12:56	180
09/09/2020	2	RM	2.117.1.1	KT	1	14:30	0
09/09/2020	2	RM	2.117.2.1	KT	1	15:04	0
09/09/2020	2	RM	2.117.3.1	K.	2	15:24	0
09/09/2020	2	RM	2.117.4.1	K.	1	15:27	0
13/10/2020	2	RM	2.118.1.1	TU	14	07:56	0
13/10/2020	2	RM	2.118.2.1	KT	1	09:38	0
13/10/2020	2	RM	2.118.3.1	ML	1	10:32	0
13/10/2020	2	RM	2.119.1.1	KT	1	11:41	0
13/10/2020	2	RM	2.119.3.1	K.	1	12:58	0
13/10/2020	2	RM	2.119.4.1	SN	1	13:17	0
13/10/2020	2	RM	2.119.5.1	HH	1	13:21	0
13/10/2020	2	RM	2.119.6.1	K.	1	13:26	0
25/11/2020	2	RM	2.123.1.1	KT	1	13:25	0
25/11/2020	2	RM	2.123.2.1	KT	1	14:10	0

Date	VP_code	Surveyor	FlightID	Species	NumBirds	ObsTime	Time at risk height (s)
25/11/2020	2	RM	2.123.3.1	L.	30	14:26	60
25/11/2020	2	RM	2.123.5.1	GD	5	15:16	0
09/12/2020	2	RM	2.126.1.1	KT	1	10:11	0
09/12/2020	2	RM	2.126.2.1	KT	1	11:28	0
09/12/2020	2	RM	2.126.3.1	KT	1	11:51	138
09/12/2020	2	RM	2.126.4.1	K.	1	11:54	0
09/12/2020	2	RM	2.127.1.1	KT	1	13:57	72
09/12/2020	2	RM	2.127.2.1	K.	1	14:52	0
09/12/2020	2	RM	2.127.3.1	KT	1	15:01	0
09/12/2020	2	RM	2.127.4.1	GD	2	15:12	63
28/01/2021	2	RM	2.130.1.1	KT	1	09:48	45
28/01/2021	2	RM	2.131.1.1	KT	1	14:42	98
28/01/2021	2	RM	2.131.2.1	HH	1	15:03	0
28/01/2021	2	RM	2.131.3.1	GP	8	16:18	60
28/01/2021	2	RM	2.131.4.1	KT	1	16:24	65
15/02/2021	2	MO	2.134.1.1	K.	1	10:26	60
15/02/2021	2	MO	2.134.2.1	HH	1	10:39	0

Date	VP_code	Surveyor	FlightID	Species	NumBirds	ObsTime	Time at risk height (s)
15/02/2021	2	MO	2.134.3.1	HH	1	11:00	0
15/02/2021	2	MO	2.134.4.1	KT	1	11:14	0
15/02/2021	2	MO	2.134.5.1	KT	1	12:02	70
15/02/2021	2	MO	2.134.6.1	KT	1	12:09	155
15/02/2021	2	MO	2.135.1.1	KT	1	13:46	65
15/02/2021	2	MO	2.135.2.1	KT	1	14:10	123
15/02/2021	2	MO	2.135.3.1	KT	1	14:39	90
15/02/2021	2	MO	2.135.4.1	HH	1	14:46	0
15/02/2021	2	MO	2.135.5.1	KT	1	15:11	190
15/02/2021	2	MO	2.135.6.1	K.	1	16:01	0
15/02/2021	2	MO	2.135.7.1	SE	1	16:20	0
15/02/2021	2	MO	2.135.8.1	SE	1	16:24	0

EUROPEAN OFFICES

United Kingdom

AYLESBURY

T: +44 (0)1844 337380

BELFAST

belfast@slrconsulting.com

BRADFORD-ON-AVON

T: +44 (0)1225 309400

BRISTOL

T: +44 (0)117 906 4280

CARDIFF

T: +44 (0)29 2049 1010

CHELMSFORD

T: +44 (0)1245 392170

EDINBURGH

T: +44 (0)131 335 6830

EXETER

T: + 44 (0)1392 490152

GLASGOW

glasgow@slrconsulting.com

GUILDFORD

guildford@slrconsulting.com

LONDON

T: +44 (0)203 805 6418

MAIDSTONE

T: +44 (0)1622 609242

MANCHESTER (Denton)

T: +44 (0)161 549 8410

MANCHESTER (Media City)

T: +44 (0)161 872 7564

NEWCASTLE UPON TYNE

T: +44 (0)191 261 1966

NOTTINGHAM

T: +44 (0)115 964 7280

SHEFFIELD

T: +44 (0)114 245 5153

SHREWSBURY

T: +44 (0)1743 23 9250

STIRLING

T: +44 (0)1786 239900

WORCESTER

T: +44 (0)1905 751310

Ireland

DUBLIN

T: + 353 (0)1 296 4667

France

GRENOBLE

T: +33 (0)6 23 37 14 14