

PEN MARCH WIND FARM

Breeding Season Bird Surveys 2019

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1.0 Introduction

1.1 Background

SLR was commissioned by Innogy Renewables UK Ltd. in March 2019 to undertake baseline breeding season ornithology surveys at the proposed Pen March Wind Farm (the Site), during the period April to August 2019.

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 Rhymney town centre. 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 Scottish Natural Heritage (SNH) Guidance¹ (which is also applicable to Wales). The scope of survey work undertaken during the 2019 breeding season is provided in Table 1-1.

Table 1-1
Scope of Ornithological Survey Work, Breeding Season 2019

Survey Type	Summary Methodology (see Section 2 for further details)
VP surveys	Based on 36 hours of survey between March/April and August 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 plus appropriate buffer zones.
Breeding wader survey	Surveys were based on current SNH guidance which includes recommendations set out in Calladine <i>et al.</i> (2009) ² , requiring an adapted Brown & Shepherd ³ method with four survey visits, at least seven days apart, between mid-April and early July. Surveys covered all accessible suitable habitat for breeding waders within 500m of possible infrastructure locations (the developable area).

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

² Calladine, J., Garner, G., Wernham, C. & Thiel, A. (2009). *The influence of survey frequency on population estimates of moorland breeding birds*. Bird Study, 56: 3, 381-388.

³ Brown, A. F & Shepherd, K. B. (1993). *A method for censusing upland breeding waders*. Bird Study 40: 189-195.

Survey Type	Summary Methodology (see Section 2 for further details)
Breeding raptor survey	Methods followed Hardey <i>et al.</i> (2013) ⁴ . Four visits to all accessible suitable habitat (moorland and crags) were undertaken for hen harrier, merlin, peregrine and short-eared owl within 2km of the developable area between April and July. In addition, potentially suitable habitat (woodland and mature trees), where accessible, was surveyed for breeding red kite within 2km of the developable area between March and August.

1.4 Purpose of this Report

This report outlines the surveys undertaken and methods used. It goes on to summarise the raw field 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 and compensation 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 SNH Guidance¹ (also applicable to Wales).

1.5.1 Primary Target Species

All Annex I and/ or Schedule 1 raptor and owl species, including:

- Hen harrier *Circus cyaneus*
- Marsh harrier *Circus aeruginosus*
- Red kite *Milvus milvus*
- Merlin *Falco columbarius*
- Peregrine *Falco peregrinus*
- Kestrel *Falco tinnunculus*
- Short-eared owl *Asio flammeus*

All wildfowl species excluding feral geese and all wader species, including:

- Curlew *Numenius arquata*
- Snipe *Gallinago gallinago*

1.5.2 Secondary Target Species

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

- Buzzard *Buteo buteo*

⁴ Hardey, J., Crick, H.Q.P., Wernham, C., Riley, H., Etheridge, B., Thompson, D. (2013). Raptors: A field guide for surveys and monitoring (3rd Edition). The Stationery Office Edinburgh.

- Sparrowhawk *Accipiter nisus*
- Gulls *Larus* sp.

2.0 Survey Methodology

2.1 Survey Areas, Dates and Personnel

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

Details of survey dates, times and observers are provided in Appendix 01. The ornithology survey areas were as described in Table 1-1 and as shown on Figure 1.

2.2 Flight Activity Surveys

36 hours of standard flight activity surveys were conducted from both VP locations during the 2019 breeding season (April to August), as summarised in Table 2-1. The VP locations are shown on Figure 2 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 SNH guidance.

Table 2-1
VP Surveys undertaken at Pen March, Breeding Season 2019

VP Number	OS Grid Reference	Hours of Survey Completed					
		April	May	June	July	August	Total
1	SO 09017 11354	6	6	9	9	6	36
2	SO 07915 09699	6	6	6	12	6	36

2.3 Breeding Wader Surveys

Surveys for breeding waders were carried out within 500m of the developable area (Figure 1) as described in the Scope of Work (Table 1-1).

The four survey visits in 2019 were carried out on the following dates:

- Visit 1: 19th April
- Visit 2: 2nd May
- Visit 3: 1st June
- Visit 4: 10th July

Surveys specifically focused on wader species, although other non-wader species of conservation concern were also recorded as seen/heard. Registrations were marked onto 1:25,000 scale survey maps using standard British Trust for Ornithology (BTO) species and activity codes for use in post-survey analysis.

Birds were considered to be confirmed breeding if:

- They were observed displaying or singing on more than one visit;
- Nests, eggs, or young were located;
- Adults repeatedly alarm called;
- Distraction displays were seen; and/ or
- Territorial disputes were observed.

Birds were considered to be probably or possibly (i.e. unconfirmed) breeding if:

- They were observed displaying or singing on one visit (with the exception of obvious passage migrants in spring); or
- A pair of birds was observed in suitable habitat for nesting.

Other records were considered to be of non-breeding birds, failed breeders, birds loafing, feeding or on passage to other areas.

In addition to recording breeding waders, incidental records of other bird species of conservation concern were also collected during the course of the breeding wader surveys.

2.4 Breeding Raptor Surveys

Species-specific surveys were undertaken for all raptors likely to occur in the survey area, including red kite, peregrine and merlin, following methods as described in the Scope of Work (Table 1-1), within 2km of the developable area (Figure 1).

During the surveys all accessible, potentially suitable, raptor breeding habitat within the survey area, including open moorland and moorland/forest edge (merlin), rock crags and outcrops (peregrine) and woodland and mature trees (red kite) was covered. Data collected during VP surveys and breeding wader surveys were also used to define raptor territories within the relevant parts of the survey area.

Survey visits during the 2019 breeding season were carried out as follows:

- April: 16th and 30th;
- May: 1st, 7th, 10th, 11th, 13th and 14th;
- June: 11th, 24th and 26th; and
- July: 24th, 25th and 26th.

2.5 Survey Limitations

Not all of the third-party land within the buffer zones for the breeding wader and breeding raptor surveys was accessible for walkover surveys. At the start of the survey period access was limited to the area within the site boundary plus the area of open moorland in the eastern part of the 2km buffer. Access was subsequently granted to the area of open moorland to the north of the site boundary and an area of fields to the southeast of the site boundary in late June and these areas were subsequently included within the July wader and raptor surveys. Areas of land to which access was not possible were surveyed from public roads/footpaths and/or from vantage points located within the site boundary. Coverage of potentially suitable habitat for waders and raptors within the inaccessible parts of the buffer zone from accessible vantage points was generally good and the lack of access is not considered to represent a significant limitation. It is possible that a small number of wader and/or raptor territories may have been overlooked within inaccessible parts of the buffer zone however.

The breeding raptor survey start date of 16th April is slightly later than the first visit recommended by Hardey *et al.* (2013)⁴ for red kite and peregrine (March to early April for both species). However, this is not considered significant in terms of identifying breeding territories of either species during the 2019 season, as both species were active throughout the whole period and it is expected that any breeding activity within the survey area would have been recorded. Other surveys were all carried out within the parameters of current guidelines (both in terms of timings and weather conditions).

With regard to viewshed coverage, there is a small gap in the visibility apparent in the centre of the developable area, which was unavoidable given the nature of the terrain (Figure 2). Any birds entering or leaving this area would have been recorded however and therefore despite the small gap in the viewshed 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.

3.0 Survey Results

3.1 Flight Activity Surveys

Flight activity recorded from VP1 and VP2 by primary target species is summarised in Table 3-1 with more detailed data provided in Appendix 03. Primary target species flights from both VPs are shown on Figures 3A1 to 3A8 and 3B1 to 3B8.

Table 3-1
Number of Primary Target Species Flights from VP1 and VP2 Combined, April – August 2019

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
	April	May	June	July	August			
Mallard	1	0	0	1	0	2	0	3
Red kite	11	14	6	18	3	52	44	57
Marsh harrier	0	0	9	0	0	9	1	9
Hen harrier	0	0	2	0	0	2	0	2
Kestrel	1	1	0	1	0	3	3	3
Peregrine	2	0	0	1	1	4	4	4
Curlew	0	2	1	1	0	4	2	4
Snipe	0	0	2	0	0	2	2	2
* precautionary risk height assumed to be between 15m – 200m								

3.1.1 Species accounts

A total of 76 flights by primary target species were recorded between April and August 2019. A breakdown of flight activity by species is presented below:

Mallard

Two mallard *Anas platyrhynchos* flights were recorded outside of the developable area around the Blaen Rhymney Reservoir. Neither flight was at possible collision risk height.

Red kite

Red kite was the most frequently recorded species recorded during the flight activity surveys. Out of 52 recorded flights, 44 were at a height whereby they were potentially at risk of collision. Flights by red kites were recorded throughout the survey area, with individuals observed circling over and transiting through the developable area (Figures 3A.4 and 3B.4).

Marsh harrier

A total of nine marsh harrier flights were recorded during the flight activity surveys. All of these flights were observed from VP1 on 25th and 26th June 2019 (Figure 3A.6), and likely concerned a single individual as all recorded flights were undertaken by a juvenile bird. Almost all flights were observed at a level below possible collision risk height, although one minute of flight at possible collision risk height was recorded at 16:38 on 25th June 2019.

Hen harrier

Two hen harrier flights were recorded during the flight activity surveys, both concerning an adult male observed from VP2 on 24th June 2019. The bird flew through the proposed development area for 107 seconds before landing within the site for five minutes. The bird then flew away in an easterly direction. All flight time was recorded below possible collision risk height.

Kestrel

Three kestrel flights were recorded during the flight activity surveys, all concerning single adult males hunting across the site. Flights were observed from VP2 (on 18th April and 9th May) and VP1 (on 27th July). The total flight time by kestrel at possible collision risk height was 490 seconds.

Peregrine

Four peregrine flights were recorded during the flight activity surveys. Three flights were observed from VP1; on 30th April and 25th July 2019. One flight was observed from VP2 on 13th August 2019. All recorded flights were observed at least partially at a height considered to be potentially at risk of collision.

Curlew

Four curlew flights were recorded during the flight activity surveys. All flights were observed from VP1 (two on 11th May, one on 25th June and one on 25th July). Two flights were observed at a height considered to be potentially at risk of collision (for a total of 59 seconds).

Snipe

Two brief snipe flights were recorded during the flight activity surveys (both from VP1 on 25th June). These flights were of displaying birds, indicating a territory well outside of the developable area.

Secondary Species

- Buzzard was recorded frequently with a maximum of 4 birds at any one time.
- The next most frequently recorded secondary species was lesser black-backed gull, followed by herring gull. Small numbers of both these species were recorded commuting across the site.

3.2 Breeding Wader Surveys

The following species accounts provide summary details on breeding wader species encountered during the 2019 surveys.

3.2.1 Curlew

One confirmed and one unconfirmed curlew territory were identified within the 500m survey buffer during breeding wader surveys (approximate territory centres are shown on Figure 4). It is not known whether either territory was successful as no young or juveniles were seen. Neither of these territories are centred within the developable area. Further details for all curlew records are as follows:

- 19th April: One curlew displaying c.900m to the east of the developable area (east of the Rhymney River).
- 2nd May: Two curlews displaying:

- One c.100m south of the developable area near the Jepson's Pond Reservoir;
- One c.400m east of the developable area near the Blaen Rhymney Reservoir.
- 1st June: One curlew in flight c.600m east of the developable area near the Blaen Rhymney Reservoir.

On the basis of the above records it was considered that there was a confirmed territory centred to the east of the potential development boundary around Blaen Rhymney (with birds recorded here in April, May and June); and one unconfirmed territory to the south of the potential development area boundary near the Jepson's Pond Reservoir (with one bird recorded on one occasion in May).

3.2.2 Snipe

Although not recorded during the breeding wader surveys, a displaying snipe was noted c.860m to the east of the potential development area (adjacent to the Rhymney River) during a VP survey in late June, indicating that a territory was present in that location (as shown on Figure 4).

3.2.3 Incidental Records of Other Species of Conservation Concern

During the four survey visits the following incidental records were made of other (non-wader) species of conservation concern:

- Wildfowl: goosander *Mergus merganser* and mallard (in the waterbodies outside of the developable area);
- Raptors: red kite, buzzard, kestrel and peregrine (foraging in and around the developable area – no evidence of breeding activity was recorded);
- Gulls: herring gull *Larus argentatus* and lesser black-backed gull *Larus fuscus* (using the reservoirs outside of the developable area for roosting);
- Moorland passerines of conservation concern: skylark *Alauda arvensis* and meadow pipit *Anthus pratensis* (common across the developable area); wheatear *Oenanthe Oenanthe* and stonechat *Saxicola torquata* (small numbers breeding);
- Woodland/farmland passerines of conservation concern: redstart *Phoenicurus phoenicurus* (one territory outside of the developable area); linnet *Carduelis cannabina* (one record only); and
- Swallow *Hirundo rustica* and house martin *Delichon urbica*: small numbers foraging across the potential development area.

3.3 Breeding Raptor Surveys

The following species accounts provide summary details on the primary target raptor species encountered during the 2019 surveys (all surveys combined). The results of the breeding raptor surveys, including the location of the peregrine breeding site can be seen in Figure 5 (Confidential Appendix 04).

3.3.1 Red kite

Although activity was frequently recorded during the breeding raptor surveys, there was no evidence of breeding by red kite within 2km of the developable area in 2019.

3.3.2 Kestrel

Kestrel was occasionally recorded foraging over the site, but there was no evidence of breeding by this species within 2km of the developable area in 2019.

3.3.3 Peregrine

Breeding occurred within a disused quarry outside the survey area to the north. An adult male was also recorded in suitable nesting habitat within the site boundary (but outside the developable area) in early May, but there was no indication of breeding at this location and no further sightings here.

3.3.4 Short-eared owl

One short-eared owl was recorded over 1km west of the developable area on 16th April only, with no further records or indication of breeding within the survey area.

3.3.5 Secondary target species

Buzzard was present within 2km of the potential development area in 2019, but breeding was not confirmed.

4.0 Summary and Conclusions

A range of ornithology surveys were carried out at the site of the proposed Pen March Wind Farm during the 2019 breeding season. These were:

- Flight activity (VP) surveys;
- Breeding wader surveys; and
- Breeding raptor surveys.

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

- Mallard;
- Red kite;
- Marsh harrier;
- Hen harrier;
- Kestrel;
- Peregrine;
- Curlew; and
- Snipe

The most frequent flight activity was by red kite (52 flights recorded), with other target species activity much less frequent. The next most frequently recorded species was marsh harrier (9 flights recorded), relating to the presence of a wandering young bird noted on two days in late June. All other primary target species were recorded four times or less.

Breeding wader surveys recorded one target species with one additional species recorded during other surveys:

- Curlew: one confirmed territory and one unconfirmed territory, both outside of the developable area; and
- Snipe was also recorded during flight activity surveys, with one unconfirmed territory outside of the developable area.

Breeding raptor surveys recorded the following primary target species and one secondary species:

- Red kite: non-breeding;
- Kestrel: non-breeding;
- Peregrine: breeding more than 2km from the potential development area, with one bird also present in potentially suitable habitat within the developable area but on a single date only;
- Short-eared owl: non-breeding;
- Buzzard: frequently recorded with no evidence of breeding.

Incidental records of other species of conservation concern included:

- Wildfowl: goosander;
- Gulls: herring gull and lesser black-backed gull;
- Moorland passerines of conservation concern: skylark, meadow pipit, wheatear and stonechat;
- Woodland/ farmland passerines of conservation concern: redstart and linnet; and

- Swallow and house martin.

4.1 Legal and Conservation Status of Target Species Recorded

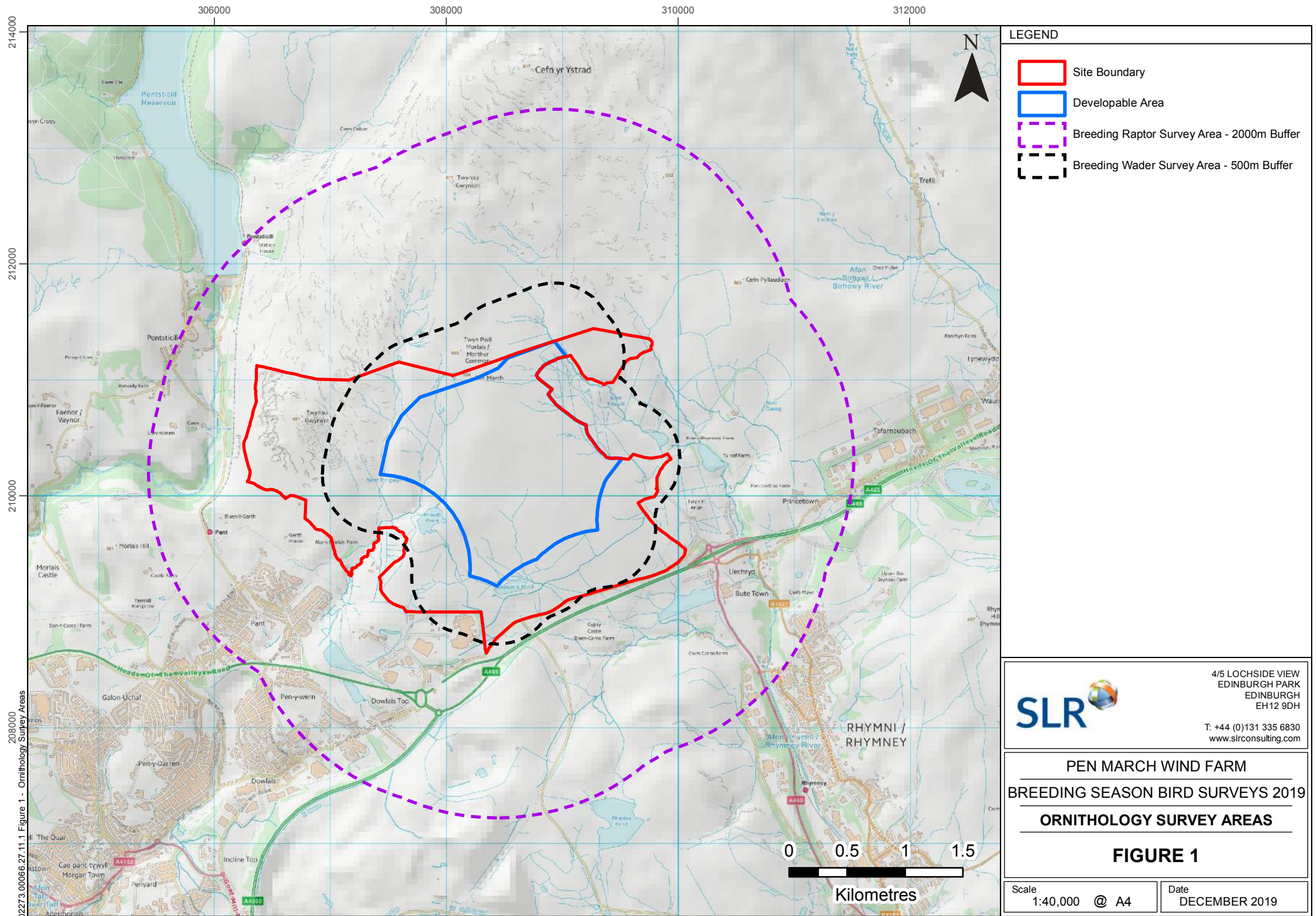
Table 4-1 summarises the legal and conservation status of the primary target species recorded during the surveys.

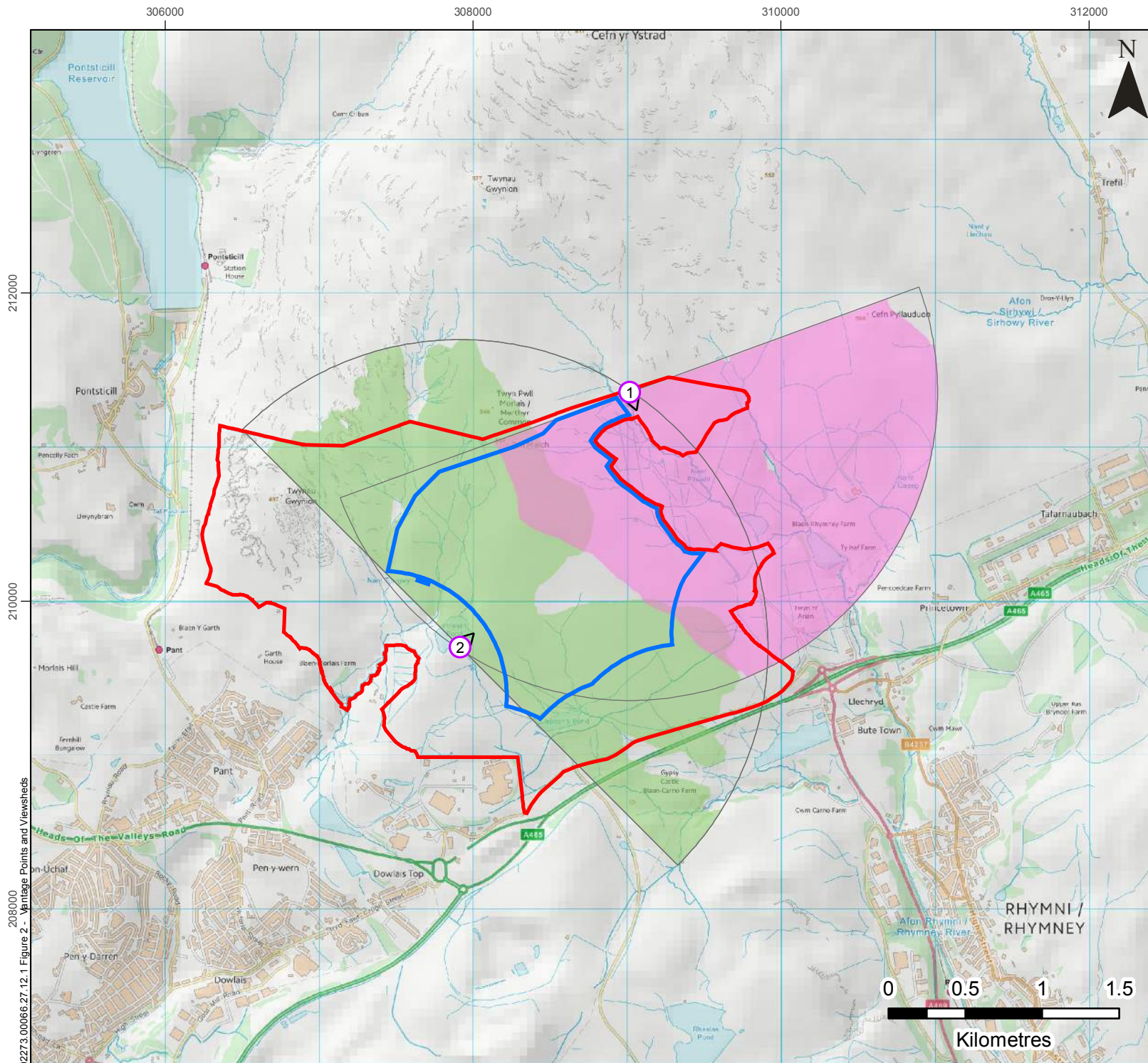
Table 4-1
Legal and Conservation Status of Primary Target Species Recorded

Species	Legal & Conservation Status in Wales
Mallard	General WCA; BoCC4 Amber
Red kite	Schedule 1 & 1A; Annex 1; BoCC4 Amber
Marsh harrier	Schedule 1; Annex 1; BoCC4 Amber
Hen harrier	Schedule 1 & 1A; Annex 1; BoCC4 Red; Sec7
Kestrel	General WCA; BoCC4 Amber, Sec7
Peregrine	Schedule 1; Annex 1; BoCC4 Green
Short-eared owl	Annex 1; BoCC4 Red
Curlew	General WCA; BoCC4 Red; Sec7
Snipe	General WCA; BoCC4 Amber
Key	• 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); • Annex 1 – the species is listed in Annex 1 of the EC Birds Directive; • BoCC4 status (green, amber or red) – indicates the current Birds of Conservation Concern status category⁵; and • Sec7: Section 7 of the Environment (Wales) Act 2016 (species of principal importance for conserving biodiversity in Wales).

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.

FIGURES





LEGEND	
	Site Boundary
	Developable Area
	Area Visible from VP01
	Area Visible from VP02
	Area Visible from both VP01 and VP02
	Vantage Point

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
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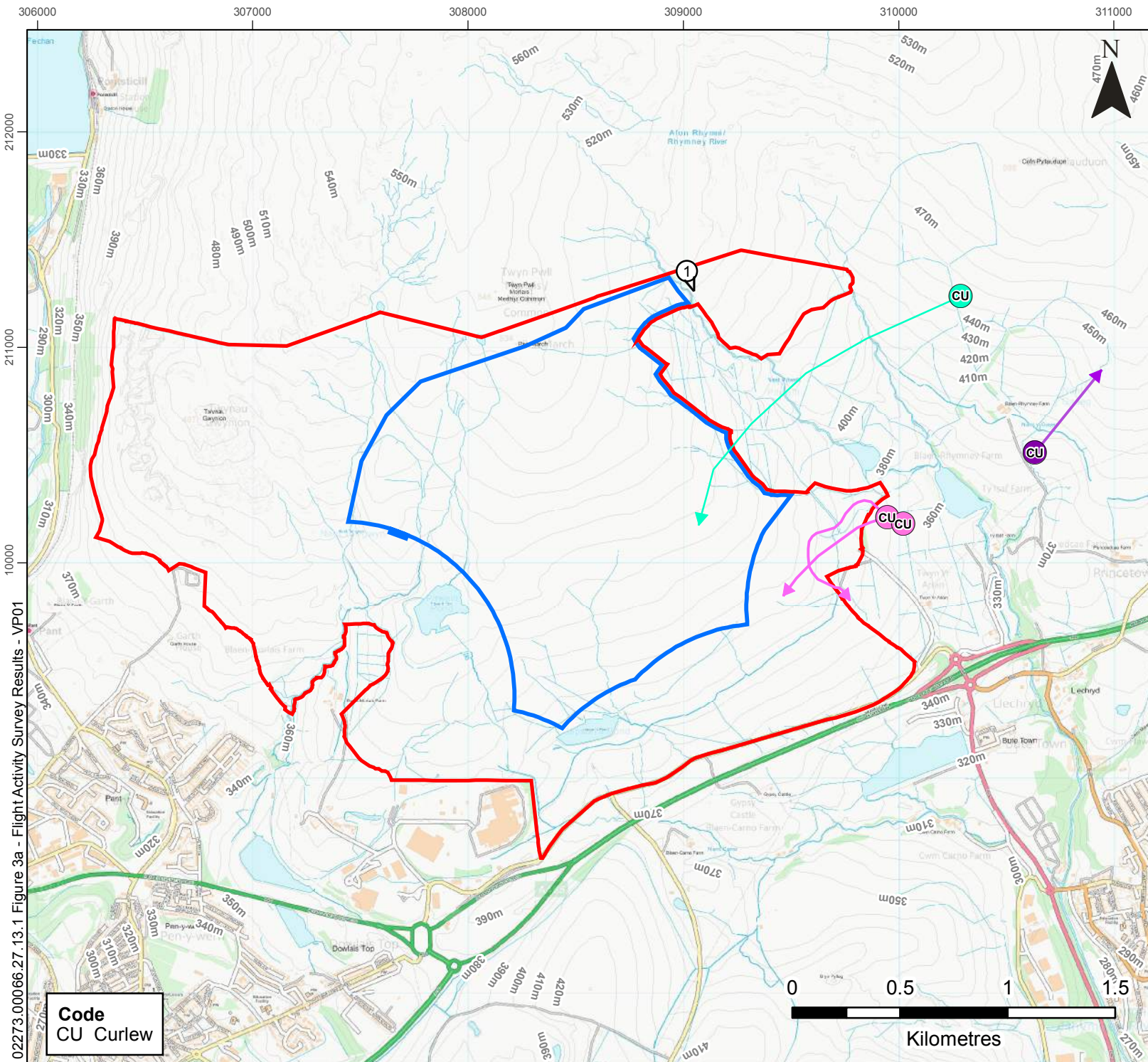
PEN MARCH WIND FARM

BREEDING SEASON BIRD SURVEYS 2019

VANTAGE POINTS AND VIEWSHEDS

FIGURE 2

Scale 1:35,000 @ A4	Date DECEMBER 2019
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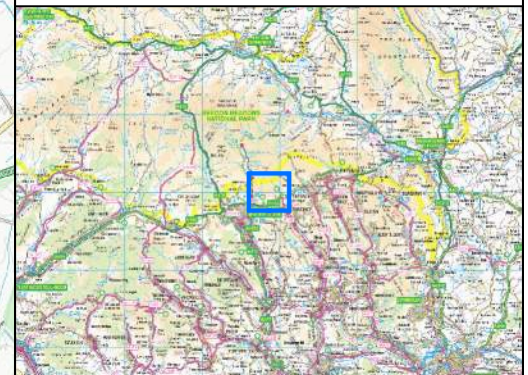


LEGEND

- Site Boundary
- Developable Area
- Vantage Point

Visit

- 11/05/2019
- 25/06/2019
- 25/07/2019



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
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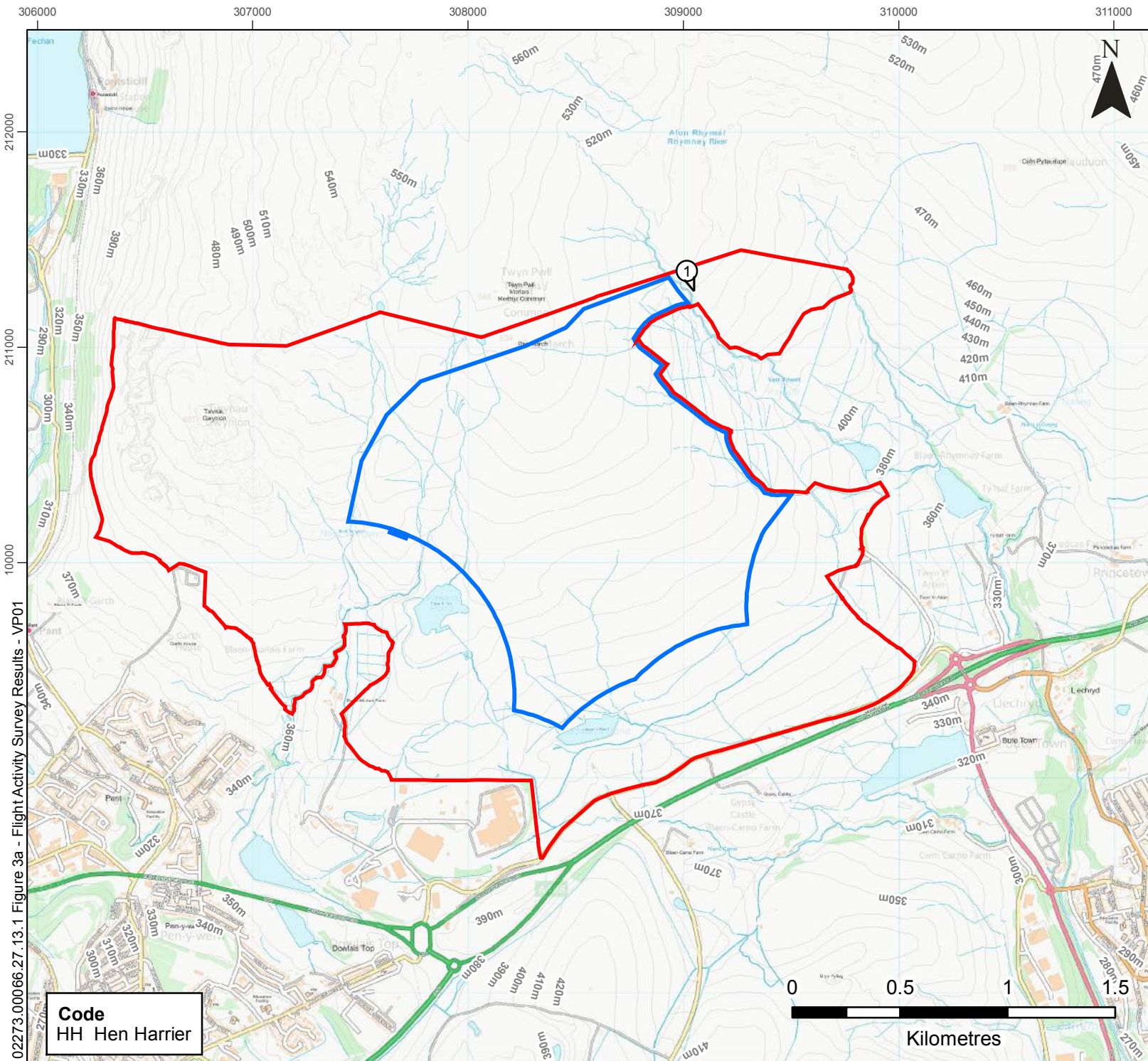
PEN MARCH WIND FARM
BREEDING SEASON BIRD SURVEYS 2019

CURLEW
FLIGHT ACTIVITY SURVEY RESULTS

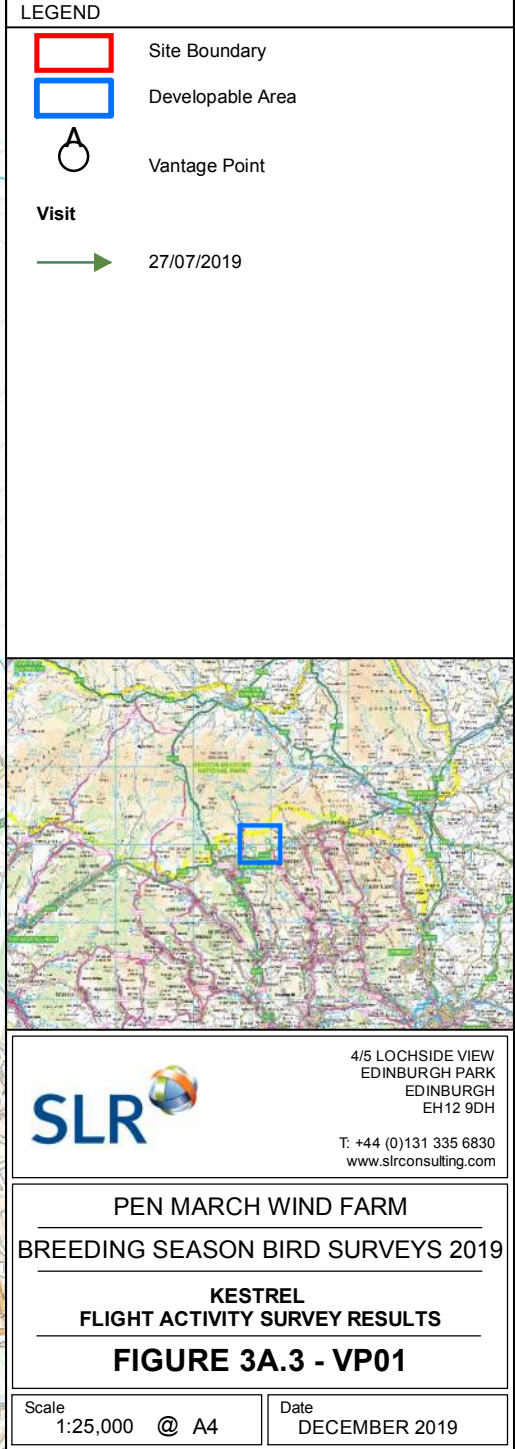
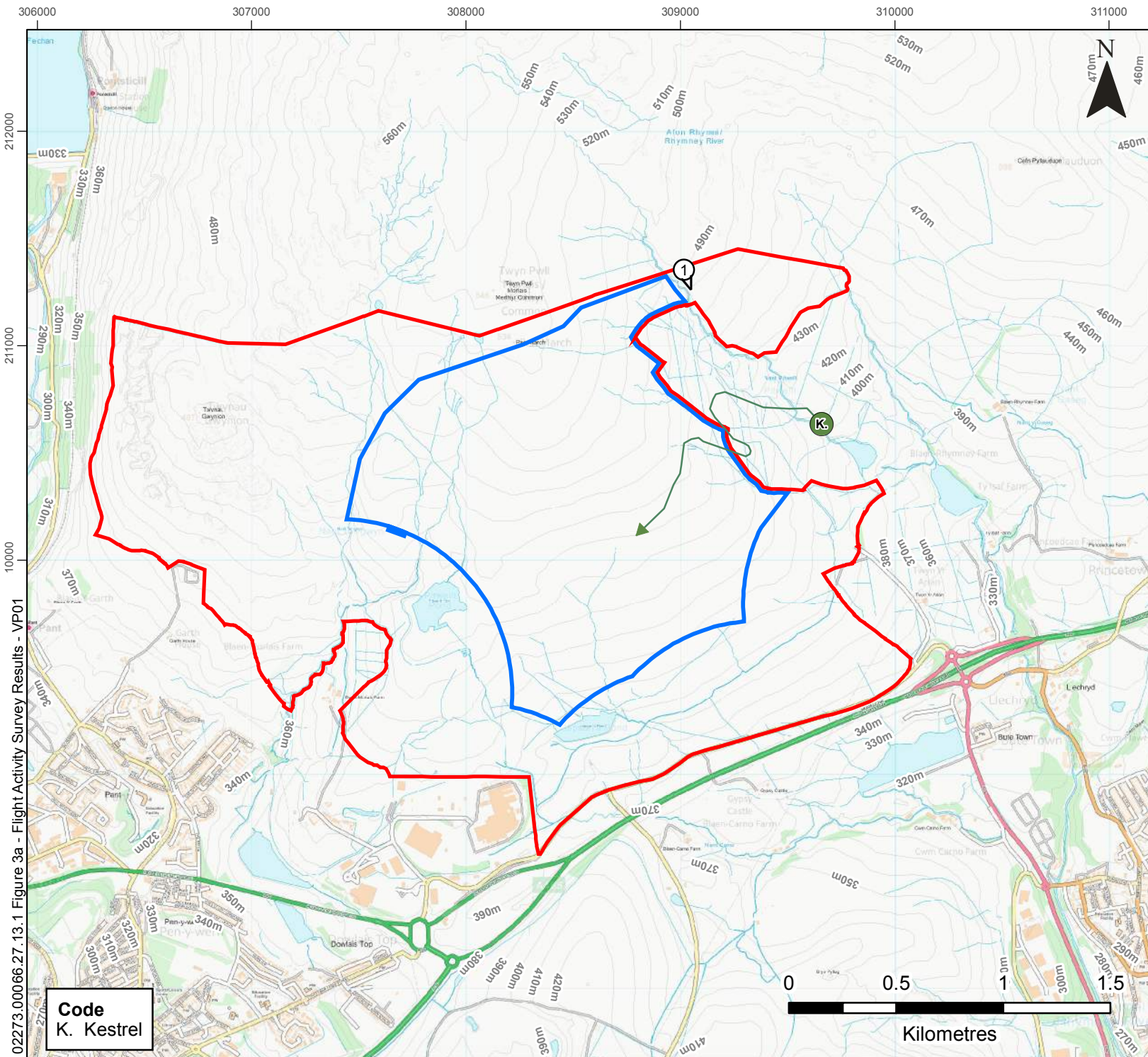
FIGURE 3A.1 - VP01

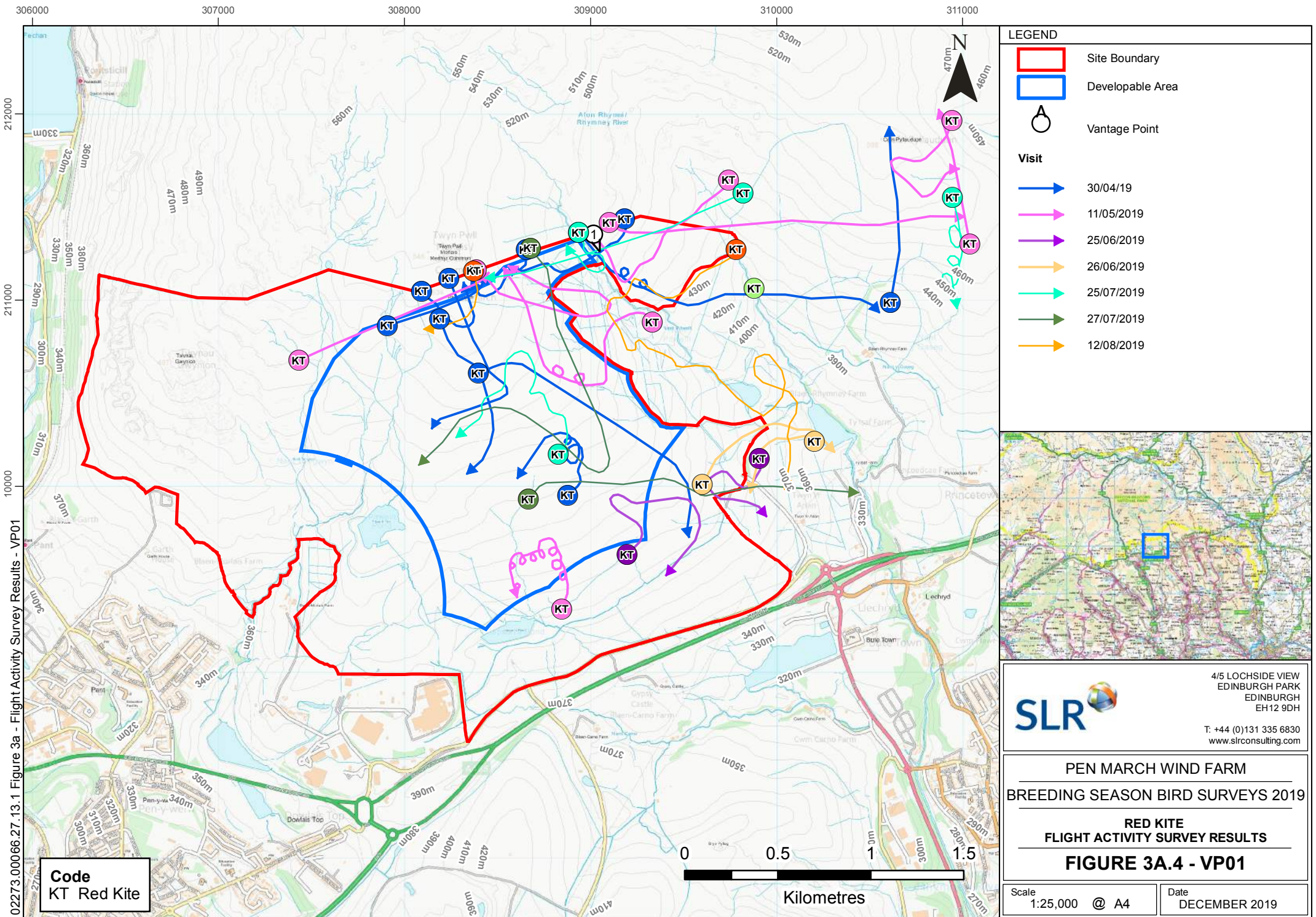
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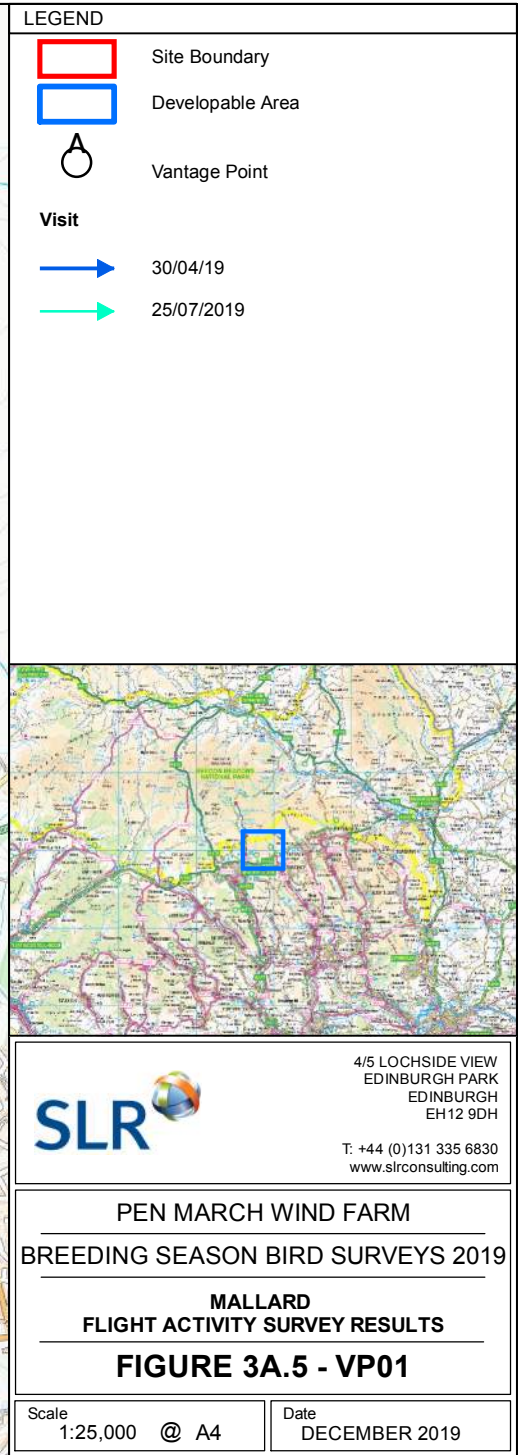
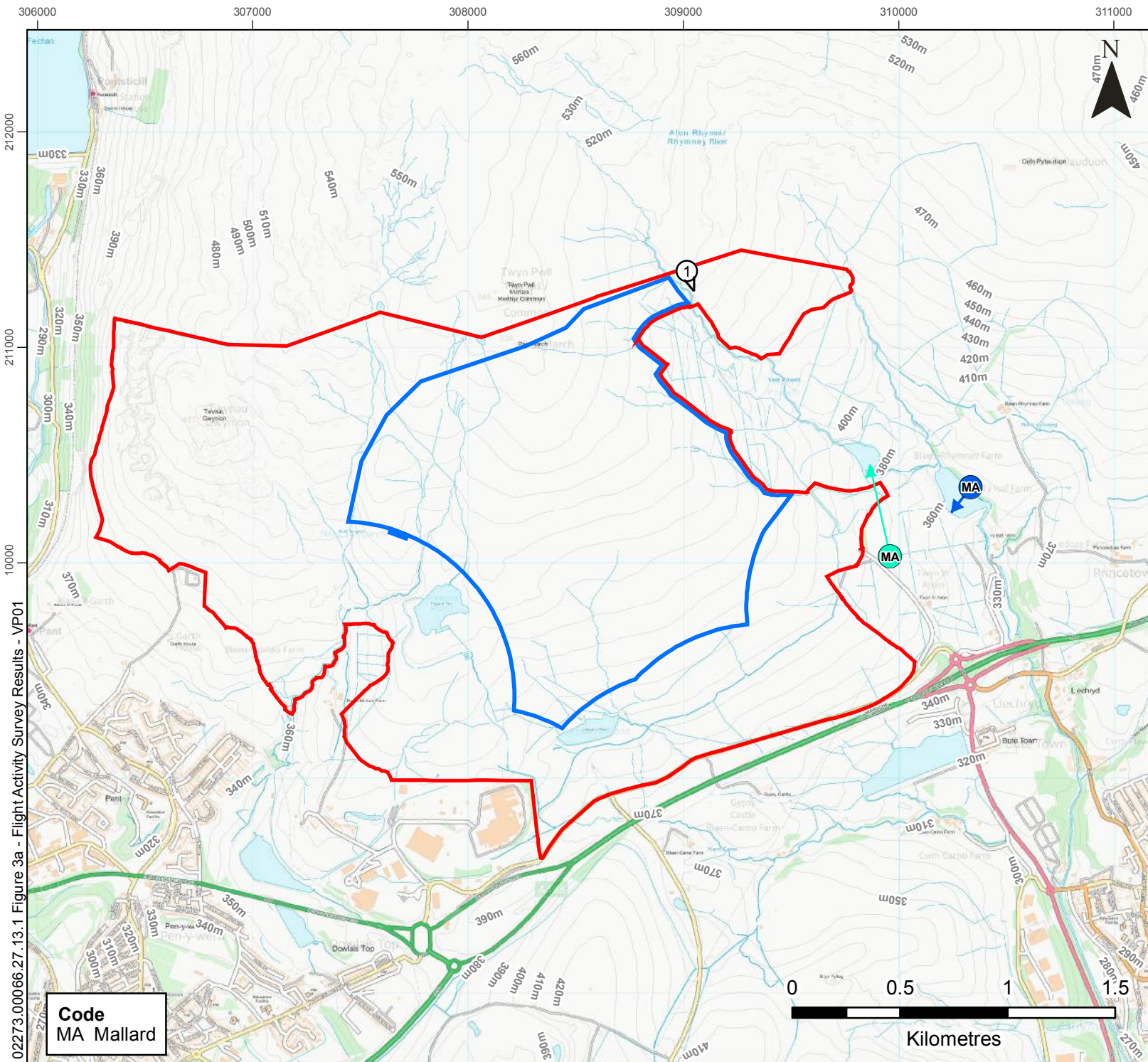
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DECEMBER 2019

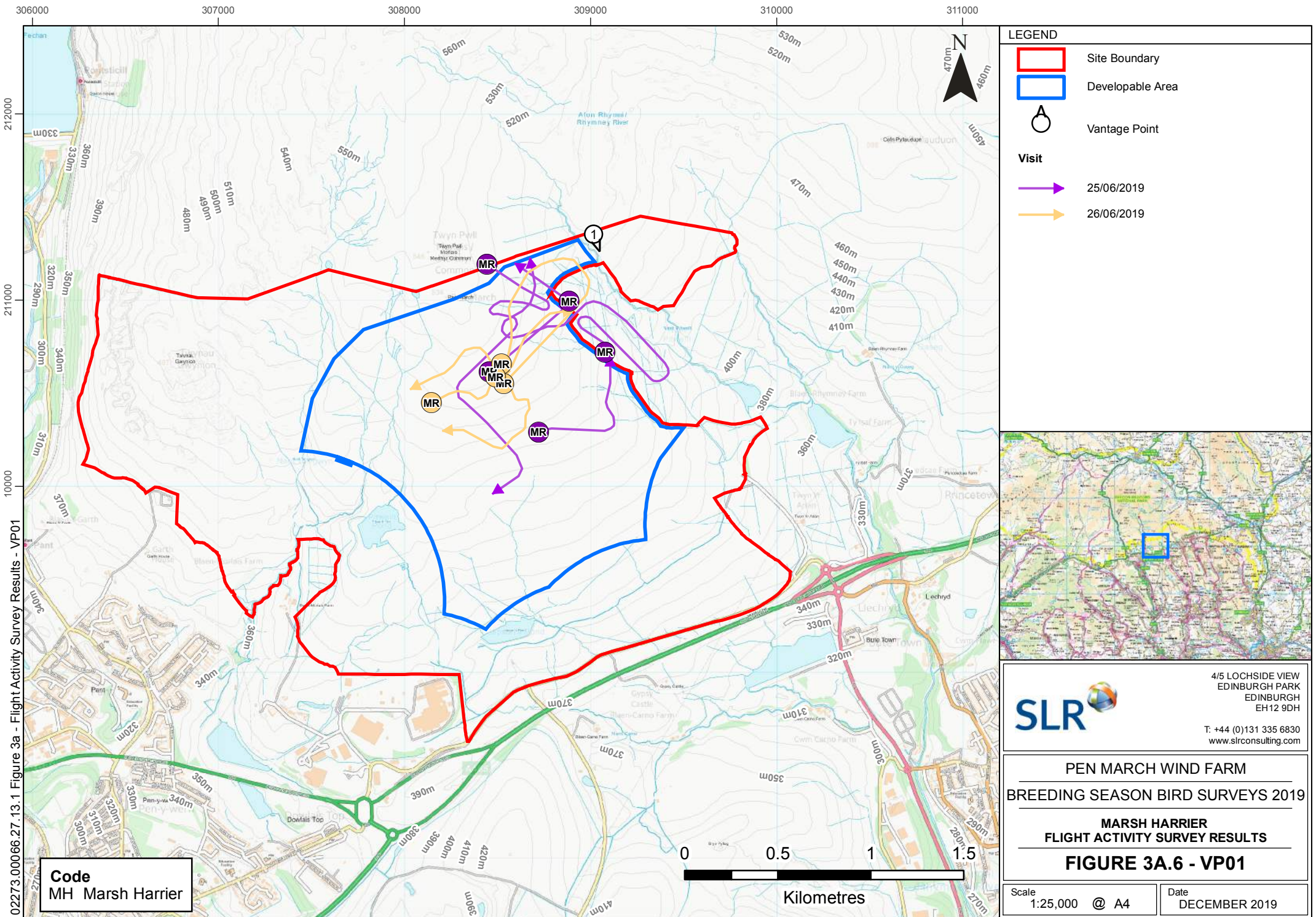


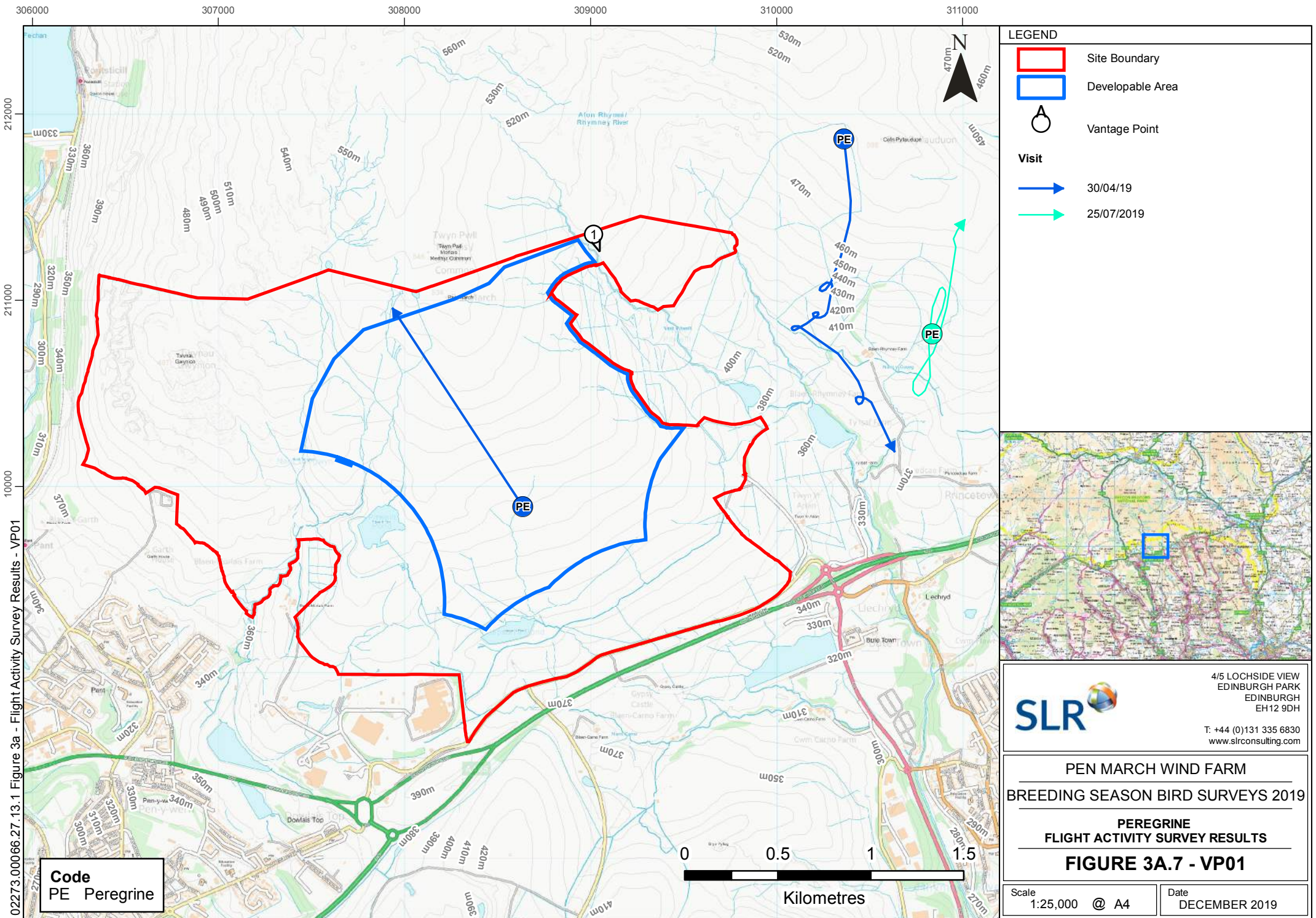
LEGEND	
	Site Boundary
	Developable Area
	Vantage Point
No Hen Harrier data recorded from VP01	
4/5 LOCHSIDE VIEW EDINBURGH PARK EDINBURGH EH12 9DH T: +44 (0)131 335 6830 www.slrconsulting.com	
PEN MARCH WIND FARM BREEDING SEASON BIRD SURVEYS 2019 HEN HARRIER FLIGHT ACTIVITY SURVEY RESULTS FIGURE 3A.2 - VP01	
Scale 1:25,000 @ A4	Date DECEMBER 2019

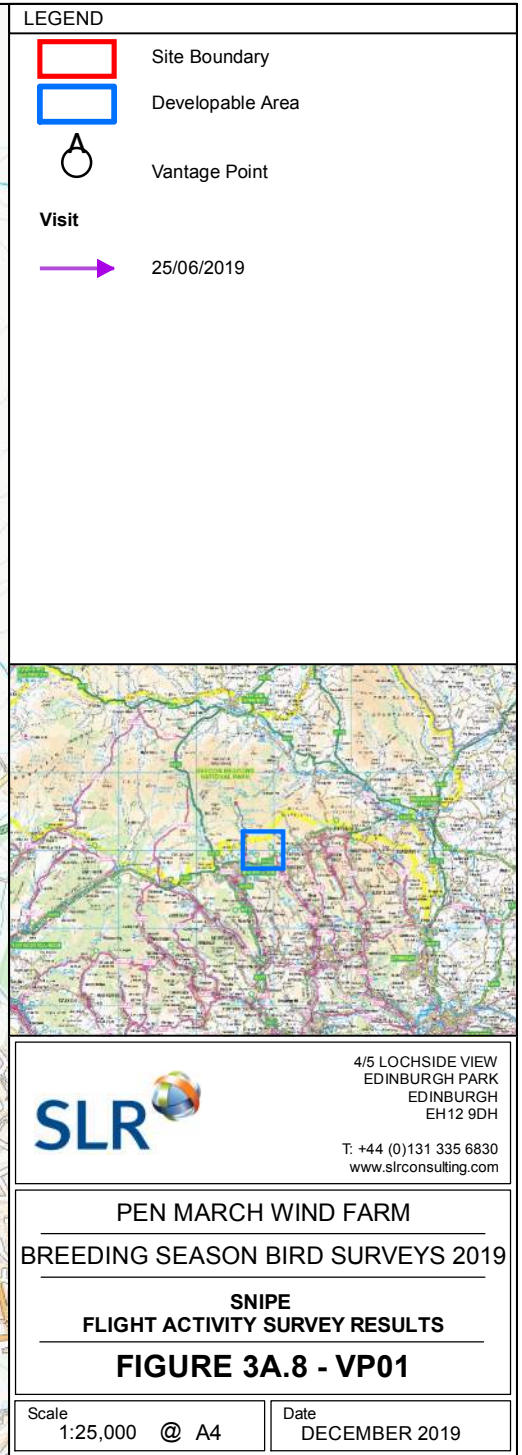
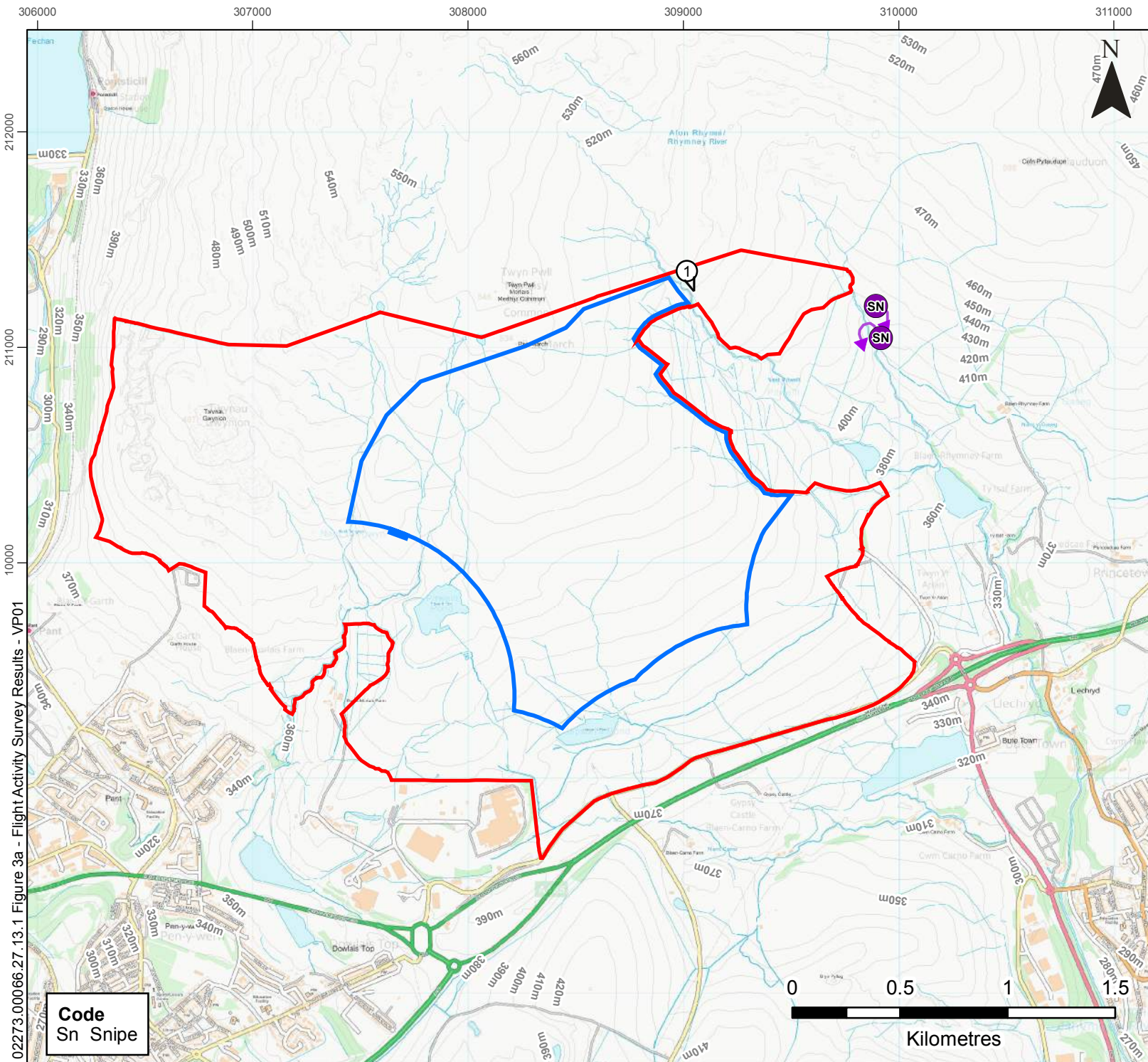


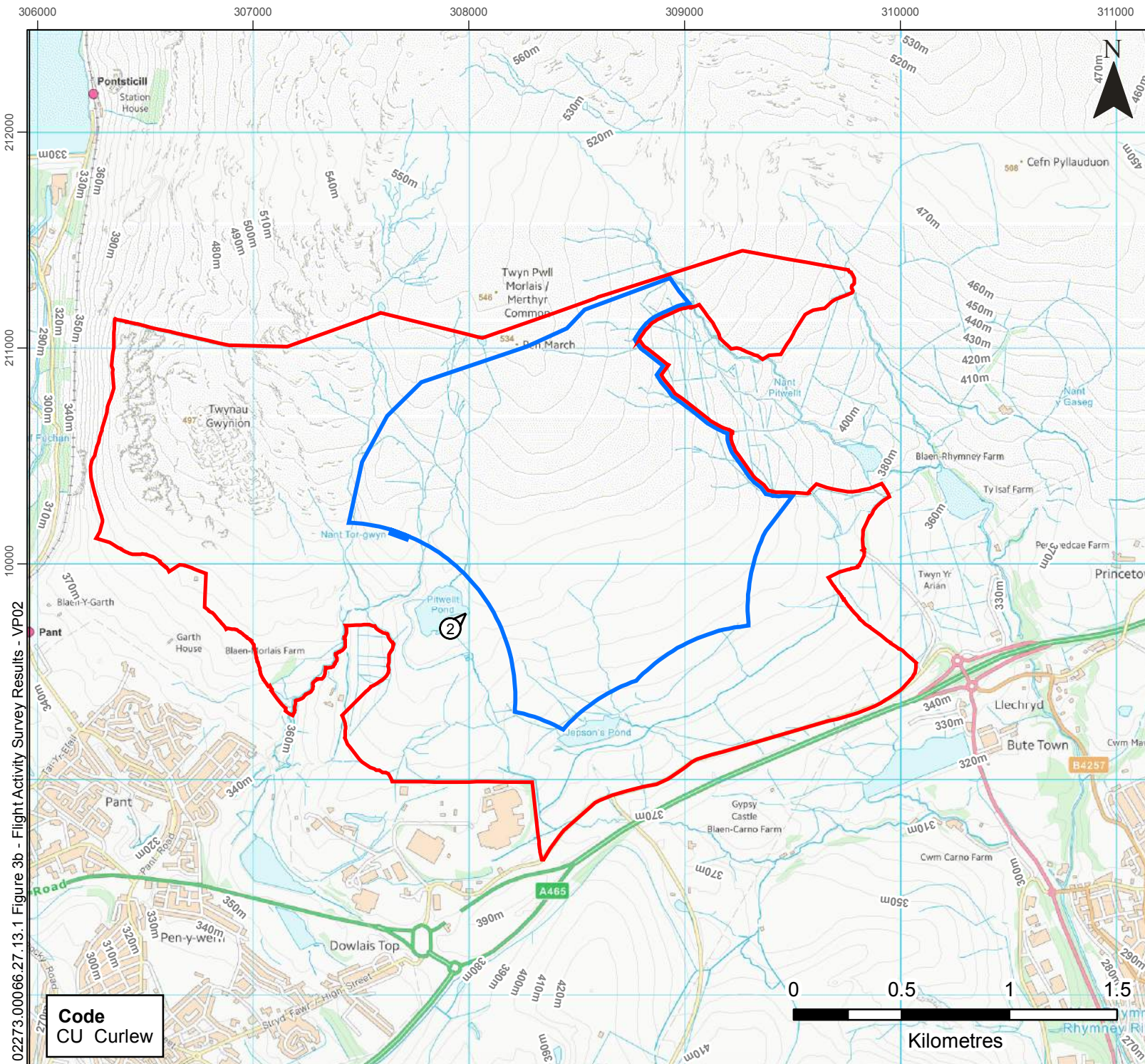












LEGEND

- Site Boundary
- Developable Area
- Vantage Point

No Curlew data recorded from VP02

SLR

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EDINBURGH
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PEN MARCH WIND FARM

BREEDING SEASON BIRD SURVEYS 2019

CURLEW

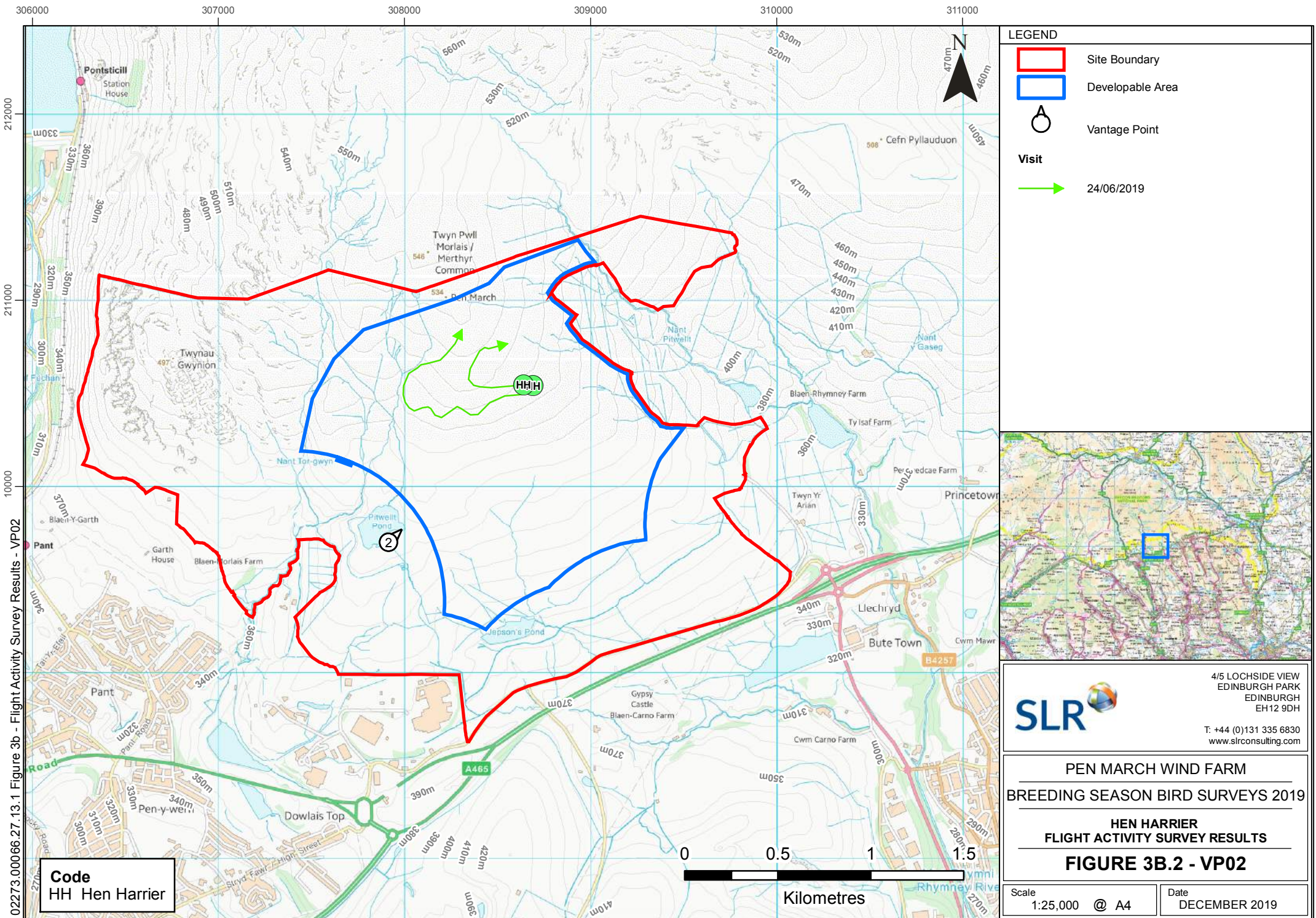
FLIGHT ACTIVITY SURVEY RESULTS

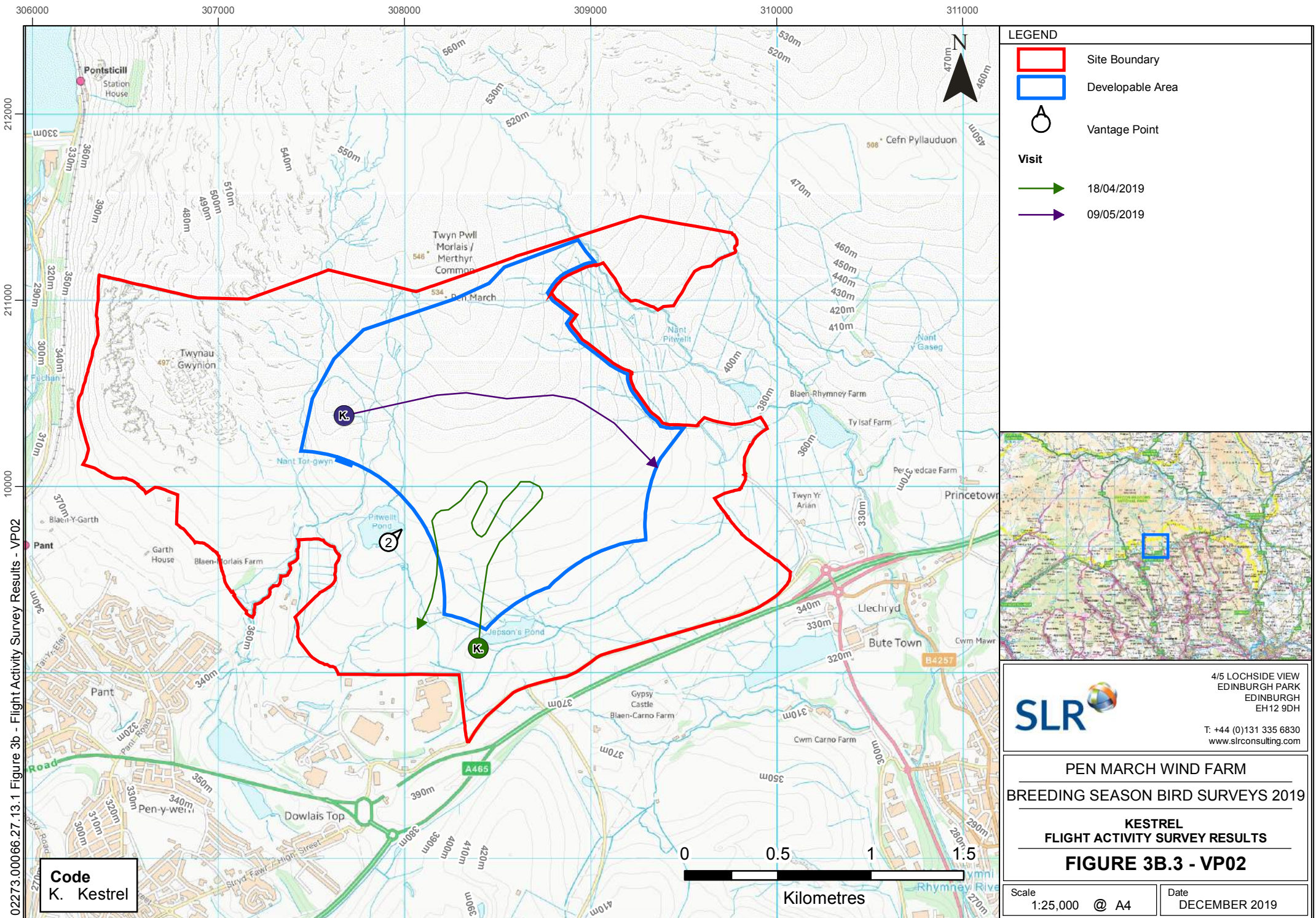
FIGURE 3B.1 - VP02

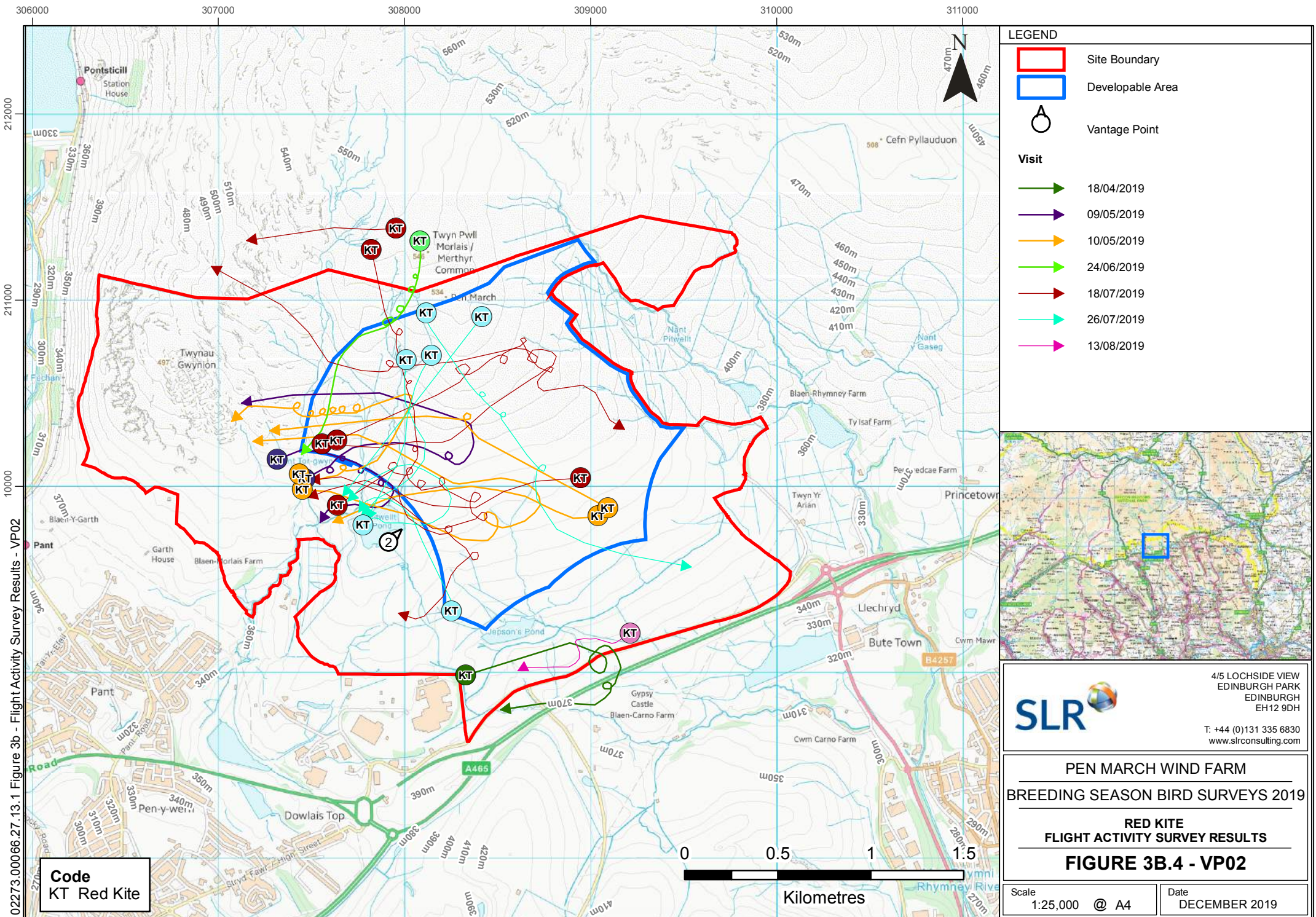
Scale 1:25,000 @ A4

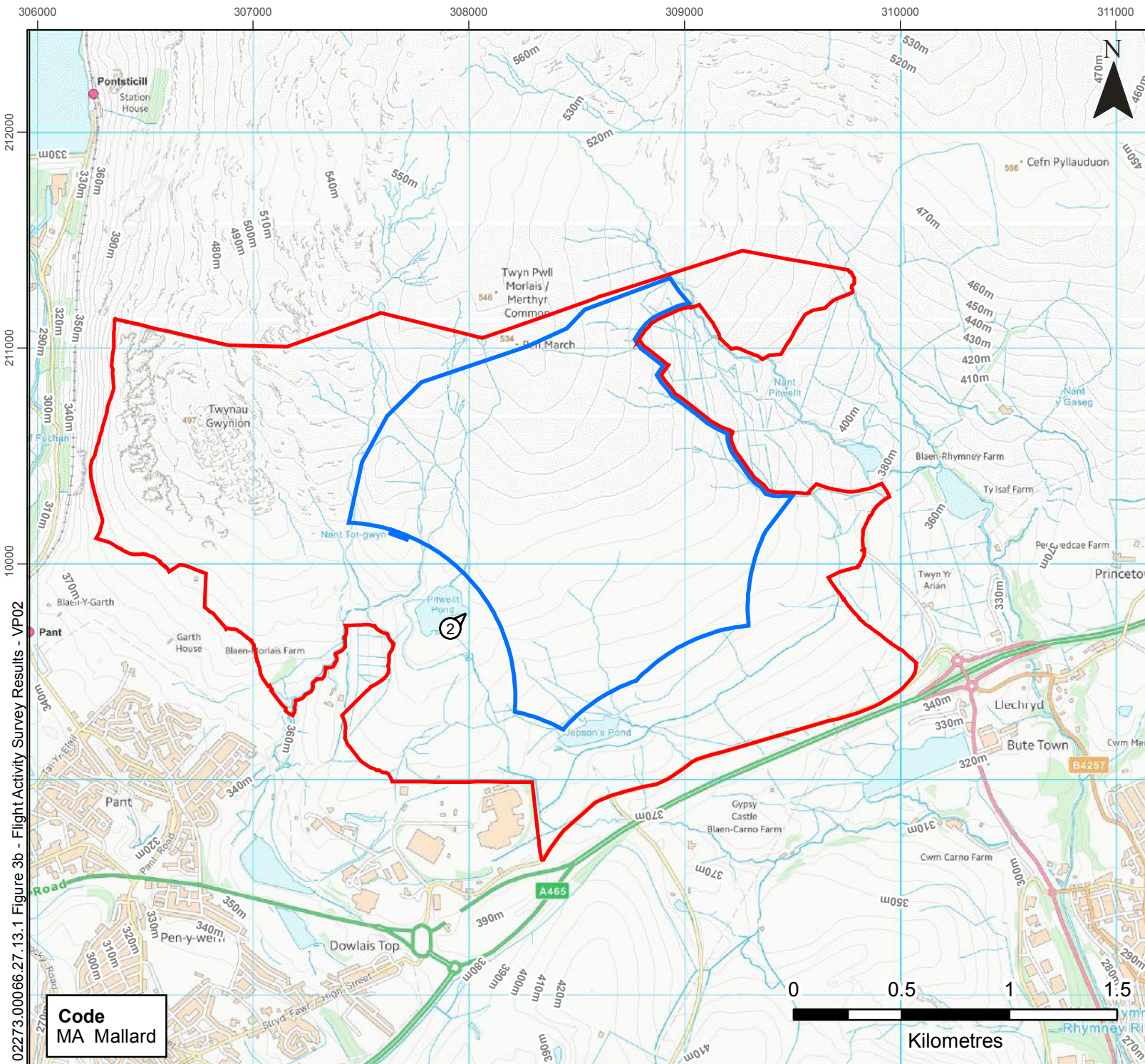
Date DECEMBER 2019

02273.00066.27.13.1 Figure 3b - Flight Activity Survey Results - VP02





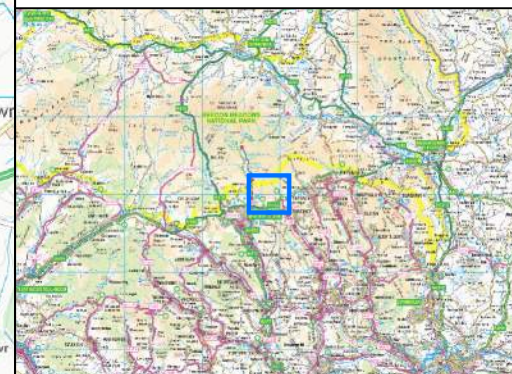




LEGEND

- Site Boundary
- Developable Area
- Vantage Point

No Mallard data recorded from VP02





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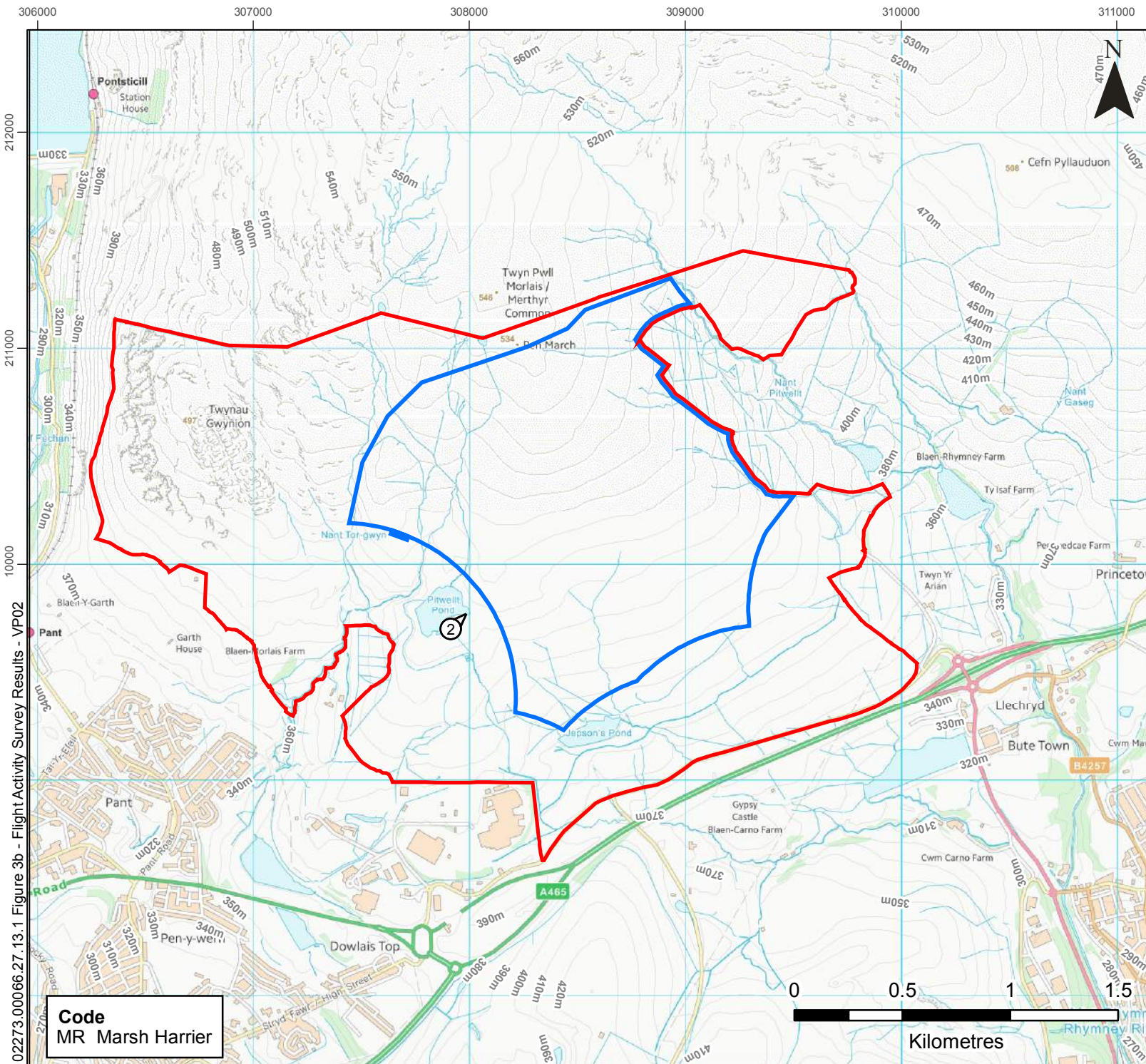
PEN MARCH WIND FARM
BREEDING SEASON BIRD SURVEYS 2019

MALLARD
FLIGHT ACTIVITY SURVEY RESULTS

FIGURE 3B.5 - VP02

Scale 1:25,000 @ A4	Date DECEMBER 2019
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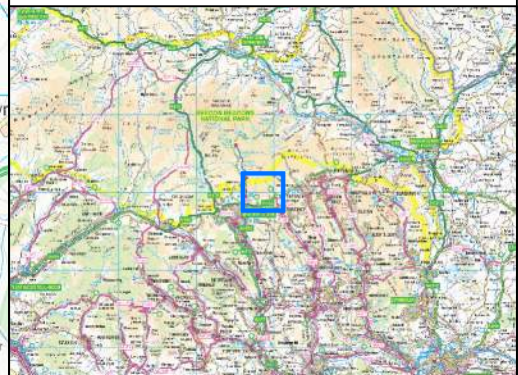
Code
MA Mallard



LEGEND

- Site Boundary
- Developable Area
- Vantage Point

No Marsh Harrier data recorded from VP02





SLR

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PEN MARCH WIND FARM

BREEDING SEASON BIRD SURVEYS 2019

**MARSH HARRIER
FLIGHT ACTIVITY SURVEY RESULTS**

FIGURE 3B.6 - VP02

Scale

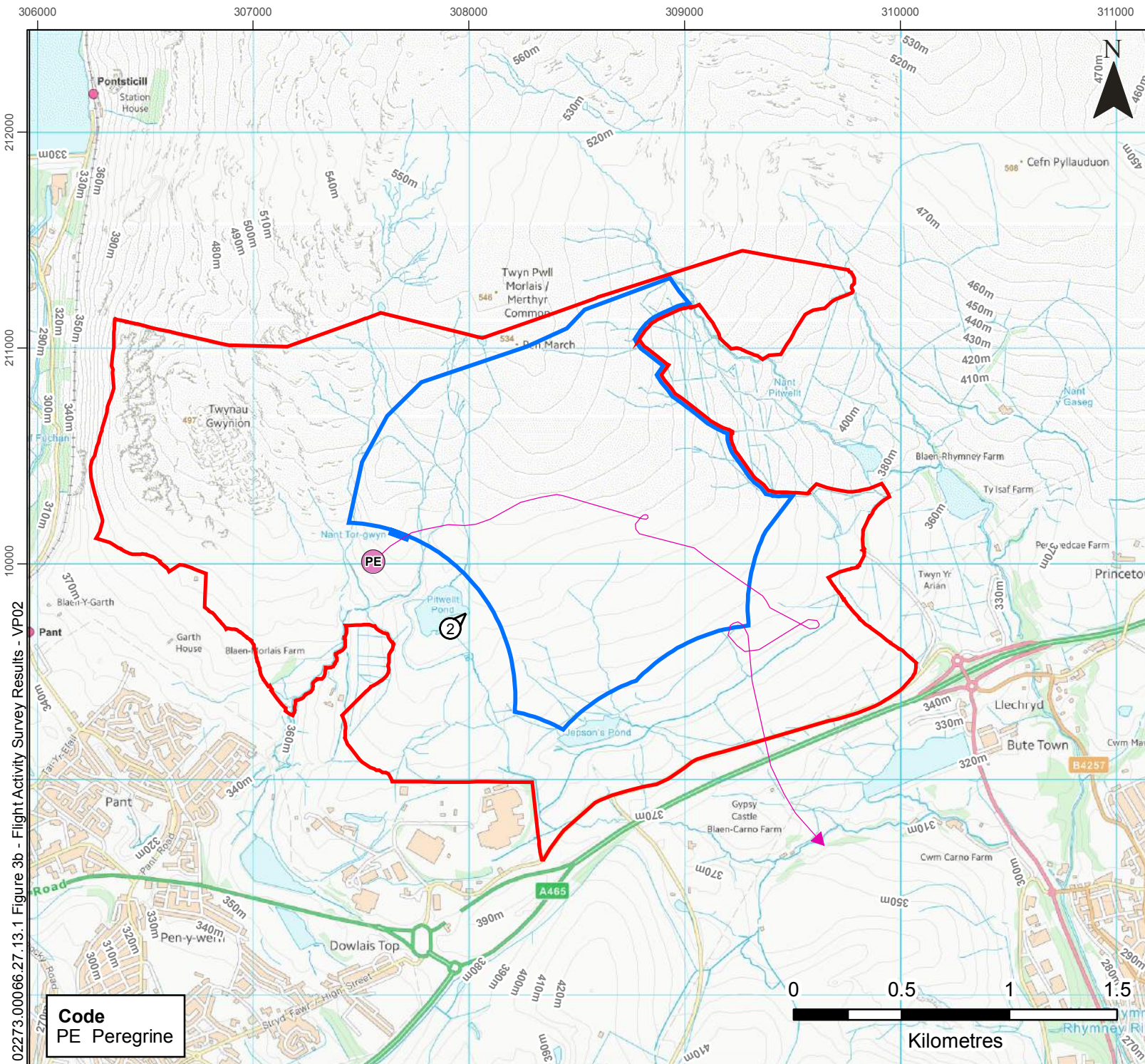
1:25,000 @ A4

Date

DECEMBER 2019

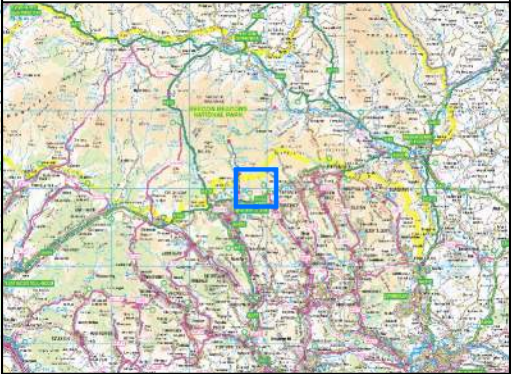
Code
MR Marsh Harrier

02273.00066.27.13.1 Figure 3b - Flight Activity Survey Results - VP02



LEGEND

- Site Boundary
- Developable Area
-  Vantage Point
- Visit**
→ 13/08/2019



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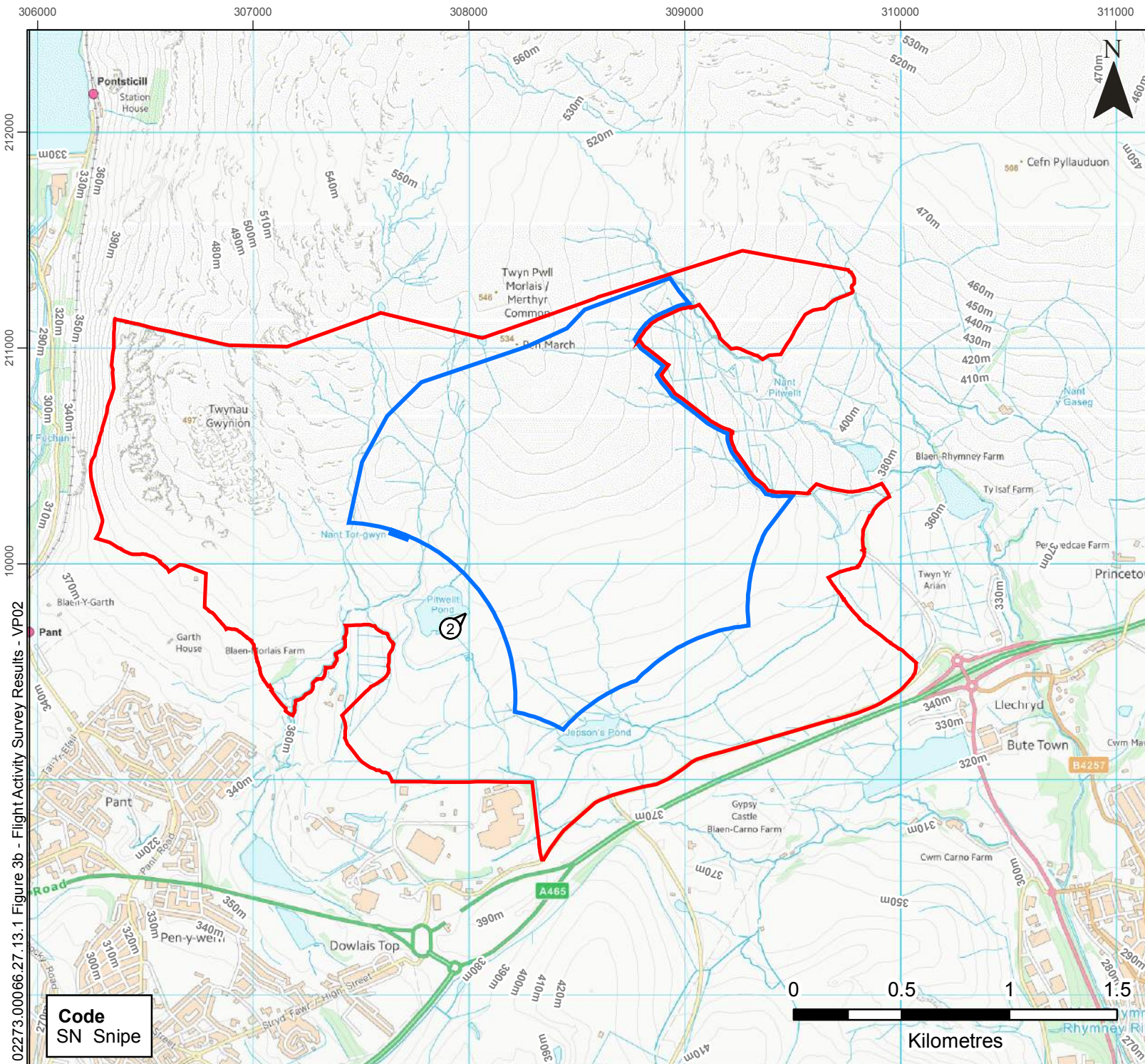
PEN MARCH WIND FARM

BREEDING SEASON BIRD SURVEYS 2019

PEREGRINE

FLIGHT ACTIVITY SURVEY RESULTS

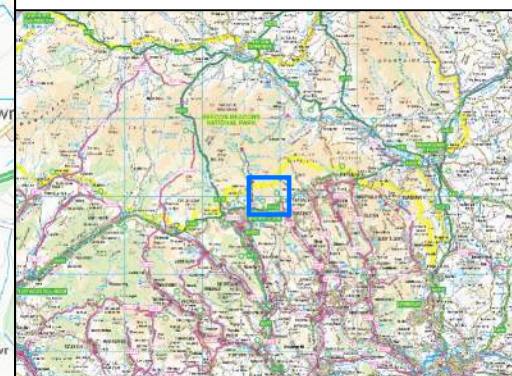
FIGURE 3B.7 - VP02



LEGEND

- Site Boundary
- Developable Area
- Vantage Point

No Snipe data recorded from VP02



SLR

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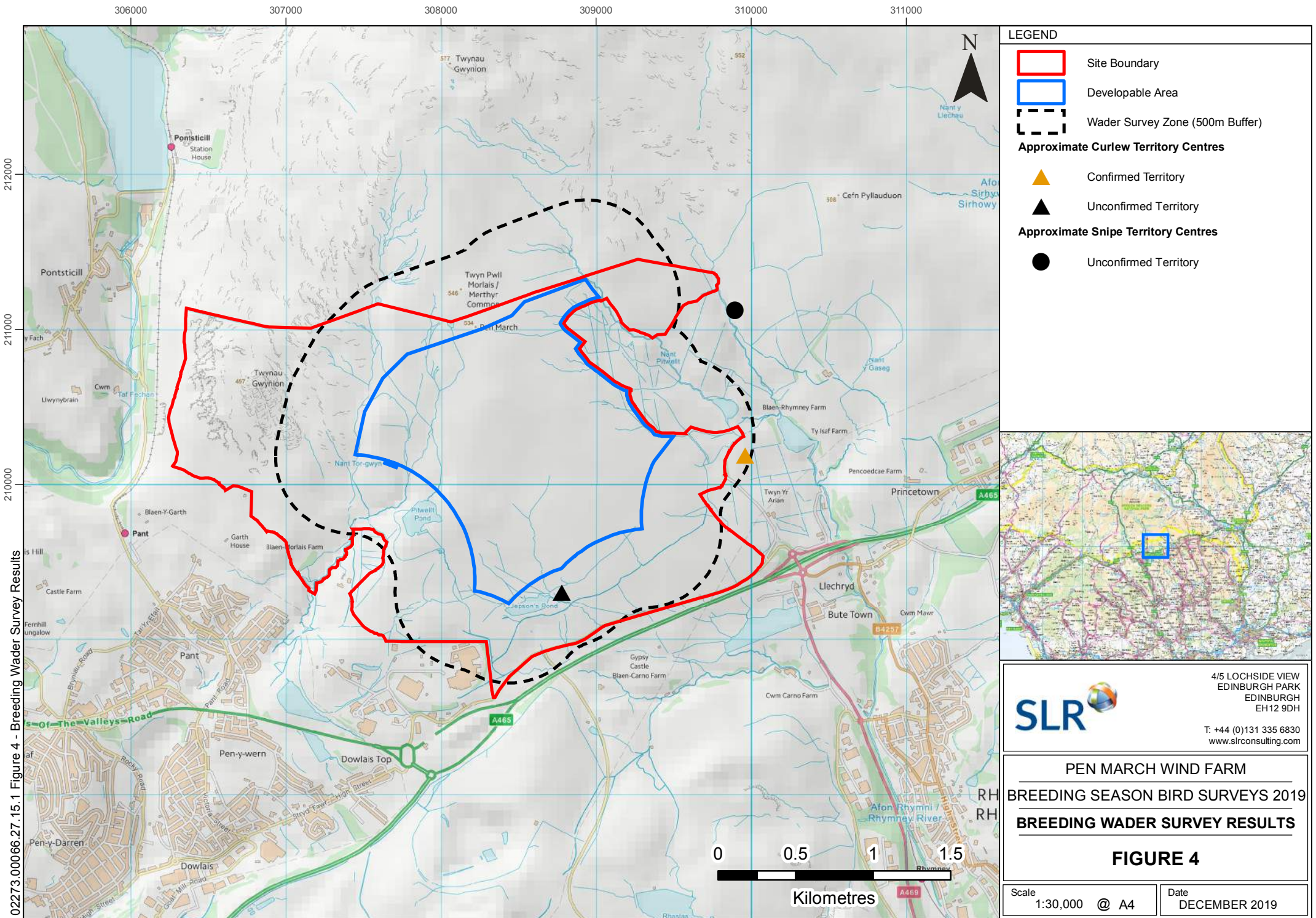
PEN MARCH WIND FARM
BREEDING SEASON BIRD SURVEYS 2019

SNIFE
FLIGHT ACTIVITY SURVEY RESULTS

FIGURE 3B.8 - VP02

Scale 1:25,000 @ A4	Date DECEMBER 2019
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Code
SN Snipe



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 (s)
30/04/19	11:10	14:10	3	MO
30/04/19	15:10	18:10	3	MO
11/05/19	12:05	15:05	3	MO
11/05/19	16:05	19:05	3	MO
06/06/19	05:00	08:00	3	ST
25/06/19	16:00	19:00	3	MO
26/06/19	12:15	15:15	3	MO
25/07/19	11:00	14:00	3	MO
25/07/19	15:00	18:00	3	MO
27/07/19	08:10	11:10	3	MO
12/08/19	11:35	14:35	3	MO
12/08/19	17:45	20:45	3	MO
TOTAL HOURS			36	

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

Date	Start Time	End Time	No. hours	Surveyor (s)
10/04/19	17:30	20:30	3	MO
18/04/19	17:15	20:15	3	ST
09/05/19	13:35	16:35	3	ST
10/05/19	12:30	15:30	3	ST
24/06/19	13:10	16:10	3	MO
24/06/19	17:10	20:10	3	MO
18/07/19	09:00	12:00	3	ST
18/07/19	12:30	15:30	3	ST
26/07/19	05:30	08:30	3	MO
26/07/19	10:30	13:30	3	MO
13/08/19	14:15	17:15	3	MO
13/08/19	10:15	13:15	3	MO

Date	Start Time	End Time	No. hours	Surveyor (s)
TOTAL HOURS			36	

Table A1-3: Details of breeding raptor surveys

Date	Start Time	End Time	No. hours	Surveyor (s)
16/04/19	08:45	14:00	5.25	ST
30/04/19	07:30	10:30	3	MO
01/05/19	07:30	16:00	8.5	MO
07/05/19	08:00	10:00	2	MO
07/05/19	08:30	16:45	8.25	ST
10/05/19	12:30	15:30	3	MO
11/05/19	07:55	10:55	3	MO
13/05/19	07:45	15:00	7.25	MO
14/05/19	07:40	12:10	3.5	MO
11/06/19	14:00	17:00	3	ST
24/06/19	07:15	10:15	3	MO
26/06/19	16:15	17:15	1	MO
27/06/19	07:00	10:15	3.25	MO
24/07/19	07:05	15:30	8.5	MO
25/07/19	06:20	09:20	3	ST
26/07/19	06:00	09:00	3	MO
TOTAL HOURS			68.5	

Table A1-4: Details of breeding wader surveys

Date	Start Time	End Time	No. hours	Surveyor (s)
19/04/19	08:00	15:00	7	ST
02/05/19	06:30	11:30	5	MO
01/06/19	06:05	11:45	5.67	ST
10/07/19	05:50	12:10	6.33	ST
TOTAL HOURS			24	

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)
30/04/19	11:10	14:10	1	1	SE	0	4	2	2	0	0	12
30/04/19	11:10	14:10	2	1	SE	0	3	2	2	0	0	13
30/04/19	11:10	14:10	3	1	SE	0	4	2	2	0	0	15
30/04/19	15:10	18:10	1	1	SE	0	2	2	2	0	0	16
30/04/19	15:10	18:10	2	1	SE	0	1	2	2	0	0	14
30/04/19	15:10	18:10	3	1	SE	0	3	2	2	0	0	13
11/05/19	16:05	19:05	1	1	S	0	5	2	2	0	0	12
11/05/19	16:05	19:05	2	2	S	0	6	2	2	0	0	11
11/05/19	16:05	19:05	3	2	S	0	7	2	2	0	0	11
11/05/19	12:05	15:05	1	2	S	0	5	2	2	0	0	10
11/05/19	12:05	15:05	2	1	S	0	6	2	2	0	0	11
11/05/19	12:05	15:05	3	1	S	0	7	2	2	0	0	11
06/06/19	05:00	08:00	1	1	SW	0	5	2	2	0	0	7
06/06/19	05:00	08:00	2	1	SW	0	5	2	2	0	0	7
06/06/19	05:00	08:00	3	1-2	SW	0	6	2	2	0	0	8
25/06/19	16:00	19:00	1	1	N	1	8	2	2	0	0	16
25/06/19	16:00	19:00	2	1	N	2	8	1	1	0	0	16
25/06/19	16:00	19:00	3	1	N	0	7	2	2	0	0	17
25/06/19	12:15	15:15	1	0	N	1	8	1	1	0	0	16
25/06/19	12:15	15:15	2	1	N	1	8	2	2	0	0	16
25/06/19	12:15	15:15	3	1	N	2	8	2	2	0	0	16
25/07/19	11:00	14:00	1	2	SE	0	2	2	2	0	0	22
25/07/19	11:00	14:00	2	2	SE	0	2	2	2	0	0	24
25/07/19	11:00	14:00	3	2	SE	0	3	2	2	0	0	28
25/07/19	15:00	18:00	1	3	SW	0	6	2	2	0	0	26
25/07/19	15:00	18:00	2	3	SW	0	4	2	2	0	0	27
25/07/19	15:00	18:00	3	3	SW	0	4	2	2	0	0	27

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visibility	Snow	Frost	Temp (°C)
26/07/19	10:30	13:30	1	2	SW	0	7	2	2	0	0	19
26/07/19	10:30	13:30	2	2	SW	0	6	2	2	0	0	20
26/07/19	10:30	13:30	3	3	SW	0	5	2	2	0	0	19
27/07/19	08:10	11:10	1	1	NW	0	6	2	2	0	0	13
27/07/19	08:10	11:10	2	1	NW	0	6	2	2	0	0	15
27/07/19	08:10	11:10	3	2	NW	0	6	2	2	0	0	16
12/08/19	17:45	20:45	1	2	W	0	5	2	2	0	0	14
12/08/19	17:45	20:45	2	2	W	0	6	2	2	0	0	12
12/08/19	17:45	20:45	3	2	W	0	6	2	2	0	0	15

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)
10/04/19	17:30	20:30	1	1	NE	0	1	2	2	0	0	11
10/04/19	17:30	20:30	2	1	NE	0	0	2	2	0	0	10
10/04/19	17:30	20:30	3	0	NA	0	0	2	2	0	0	8
18/04/19	17:15	20:15	1	1	SE	0	5	2	2	0	0	15
18/04/19	17:15	20:15	2	2	SE	0	6	2	2	0	0	14
18/04/19	17:15	20:15	3	2	SE	0	6	2	2	0	0	13
09/05/19	13:35	16:35	1	3	NW	2	8	2	2	0	0	9
09/05/19	13:35	16:35	2	3	NW	2	7	2	2	0	0	10
09/05/19	13:35	16:35	3	2	NW	2	7	2	2	0	0	11
10/05/19	12:30	15:30	1	1	SW	0	6	2	2	0	0	10
10/05/19	12:30	15:30	2	1	SW	0	5	2	2	0	0	11
10/05/19	12:30	15:30	3	2	W	0	6	2	2	0	0	11
24/06/19	13:10	16:10	1	2	SW	0	3	2	2	0	0	18
24/06/19	13:10	16:10	2	3	SW	0	4	2	2	0	0	17
24/06/19	13:10	16:10	3	3	SW	0	4	2	2	0	0	18

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visibility	Snow	Frost	Temp (°C)
24/06/19	17:10	20:10	1	3	SW	0	7	2	2	0	0	16
24/06/19	17:10	20:10	2	2	W	0	6	2	2	0	0	17
24/06/19	17:10	20:10	3	2	W	0	5	2	2	0	0	17
18/07/19	12:30	16:30	1	2	NW	0	6	2	2	0	0	19
18/07/19	12:30	16:30	2	3	NW	0	6	2	2	0	0	20
18/07/19	12:30	16:30	3	2	NW	0	6	2	2	0	0	20
18/07/19	09:00	12:00	1	2	NW	0	8	2	2	0	0	15
18/07/19	09:00	12:00	2	3	NW	0	6	2	2	0	0	16
18/07/19	09:00	12:00	3	3	NW	0	6	2	2	0	0	17
26/07/19	05:30	08:30	1	3	S	1	8	2	2	0	0	16
26/07/19	05:30	08:30	2	2	S	0	8	2	2	0	0	16
26/07/19	05:30	08:30	3	3	S	1	8	2	2	0	0	15
13/08/19	14:15	17:15	1	2	W	0	4	2	2	0	0	17
13/08/19	14:15	17:15	2	2	W	0	5	2	2	0	0	16
13/08/19	14:15	17:15	3	2	W	0	4	2	2	0	0	16
13/08/19	10:15	13:15	1	2	W	0	4	2	2	0	0	16
13/08/19	10:15	13:15	2	2	W	0	3	2	2	0	0	17
13/08/19	10:15	13:15	3	3	W	0	4	2	2	0	0	17

Table A2-3: Weather data for breeding wader and raptor surveys

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visib ility	Snow	Frost	Temp (°C)
16/04/19	08:45	14:00	1	2	E	1	8	1	2	0	0	10
16/04/19	08:45	14:00	2	2	E	1	8	1	2	0	0	11
16/04/19	08:45	14:00	3	2	SE	0	8	2	2	0	0	13
16/04/19	08:45	14:00	4	1	SE	0	8	2	2	0	0	14
16/04/19	08:45	14:00	5	1	SE	0	8	2	2	0	0	15
19/04/19	08:00	15:00	1	1	SE	0	3	2	2	0	0	12
19/04/19	08:00	15:00	2	2	SE	0	3	2	2	0	0	14

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visib ility	Snow	Frost	Temp (°C)
19/04/19	08:00	15:00	3	2	SE	0	4	2	2	0	0	15
19/04/19	08:00	15:00	4	2	SE	0	4	2	2	0	0	17
19/04/19	08:00	15:00	5	2	SE	0	4	2	2	0	0	17
19/04/19	08:00	15:00	6	2	SE	0	3	2	2	0	0	18
30/04/19	07:30	10:30	1	2	SE	0	2	2	2	0	0	10
30/04/19	07:30	10:30	2	1	SE	0	1	2	2	0	0	11
30/04/19	07:30	10:30	3	2	SE	0	3	2	2	0	0	13
01/05/19	07:30	16:00	1	1	SW	0	7	2	2	0	0	10
01/05/19	07:30	16:00	2	1	SW	1	8	2	2	0	0	11
01/05/19	07:30	16:00	3	1	SW	0	7	2	2	0	0	12
01/05/19	07:30	16:00	4	1	SW	0	8	2	2	0	0	12
01/05/19	07:30	16:00	5	1	SW	0	8	2	2	0	0	12
01/05/19	07:30	16:00	6	1	SW	0	7	2	2	0	0	14
01/05/19	07:30	16:00	7	1	SW	0	6	2	2	0	0	14
01/05/19	07:30	16:00	8	1	SW	0	6	2	2	0	0	14
01/05/19	07:30	16:00	9	1	SW	0	6	2	2	0	0	14
02/05/19	06:30	11:30	1	1		0	6	2	2	0	0	8
02/05/19	06:30	11:30	2	1		0	7	2	2	0	0	8
02/05/19	06:30	11:30	3	0		0	5	2	2	0	0	9
02/05/19	06:30	11:30	4	1		0	5	2	2	0	0	9
02/05/19	06:30	11:30	5	1		0	7	2	2	0	0	9
02/05/19	06:30	11:30	6	1		0	8	2	2	0	0	10
07/05/19	09:00	16:45	1	1	SW	0	3	2	2	0	0	14
07/05/19	09:00	16:45	2	1	SW	0	3	2	2	0	0	15
07/05/19	09:00	16:45	3	1	SW	0	3	2	2	0	0	16
07/05/19	09:00	16:45	4	1	SW	0	4	2	2	0	0	17
07/05/19	09:00	16:45	5	1	SW	0	5	2	2	0	0	18
07/05/19	09:00	16:45	6	1	SW	0	5	2	2	0	0	18
07/05/19	09:00	16:45	7	1	SW	0	6	2	2	0	0	18

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visib ility	Snow	Frost	Temp (°C)
07/05/19	08:00	10:00	1	1	N	1	8	2	2	0	0	15
07/05/19	08:00	10:00	2	2	N	0	8	2	2	0	0	16
07/05/19	08:00	10:00	3	1	N	0	8	2	2	0	0	16
11/05/19	07:55	10:55	1	1	S	0	3	2	2	0	0	7
11/05/19	07:55	10:55	2	1	S	0	4	2	2	0	0	8
11/05/19	07:55	10:55	3	1	S	0	4	2	2	0	0	10
11/05/19	07:55	10:55	4	2	S	0	5	2	2	0	0	11
01/06/19	06:05	11:45	1	0	S	0	6	2	2	0	0	9
01/06/19	06:05	11:45	2	1	S	0	7	2	2	0	0	11
01/06/19	06:05	11:45	3	1	S	0	6	2	2	0	0	13
01/06/19	06:05	11:45	4	1	SE	0	5	2	2	0	0	13
01/06/19	06:05	11:45	5	0	SE	0	5	2	2	0	0	14
01/06/19	06:05	11:45	6	0	SE	0	4	2	2	0	0	15
10/07/19	05:50	12:10	1	2	W	0	6	2	2	0	0	15
10/07/19	05:50	12:10	2	1	W	0	8	2	2	0	0	16
10/07/19	05:50	12:10	3	2	W	0	7	2	2	0	0	18
10/07/19	05:50	12:10	4	2	W	0	7	2	2	0	0	18
10/07/19	05:50	12:10	5	2	W	0	6	2	2	0	0	19
10/07/19	05:50	12:10	6	2	W	0	4	2	2	0	0	19
10/07/19	05:50	12:10	7	2	W	0	4	2	2	0	0	19
10/07/19	05:50	12:10	8	2	W	0	3	2	2	0	0	19
24/07/19	07:05	15:30	1	2	SW	0	5	2	2	0	0	18
24/07/19	07:05	15:30	2	1	SW	1	4	2	2	0	0	18
24/07/19	07:05	15:30	3	2	SW	2	2	2	2	0	0	20
24/07/19	07:05	15:30	4	2	SW	3	4	2	2	0	0	23
24/07/19	07:05	15:30	5	1	SW	4	4	2	2	0	0	24
24/07/19	07:05	15:30	6	2	SW	5	5	2	2	0	0	25
25/07/19	06:20	09:20	1	2	SW	0	6	2	2	0	0	18
25/07/19	06:20	09:20	2	2	SW	0	5	2	2	0	0	18

Date	Survey start	Survey end	Hour	Wind Speed	Wind Direction	Rain	Cloud cover	Cloud height	Visib ility	Snow	Frost	Temp (°C)
25/07/19	06:20	09:20	3	1	SW	0	5	2	2	0	0	19
25/07/19	06:20	09:20	4	2	SW	0	3	2	2	0	0	20
26/07/19	06:00	09:00	1	1	S	0	6	2	2	0	0	16
26/07/19	06:00	09:00	2	2	S	0	7	2	2	0	0	16
26/07/19	06:00	09:00	3	2	S	0	7	2	2	0	0	16
26/07/19	06:00	09:00	4	2	S	0	8	2	2	0	0	17

APPENDIX 03

Flight activity survey data

Date	VP code	Surveyor	FlightID	Species	Num Birds	Obs Time	Flight (s)	time	Time at risk height (s)	comments
18/04/2019	2	ST	1	Kestrel	1	17:42	200		200	Hunting
18/04/2019	2	ST	2	Red kite	1	18:37	105		105	interaction
30/04/2019	1	MO	3	Red kite	1	11:28	65		65	Transit (Hazy)
30/04/2019	1	MO	4	Mallard	2	11:35	3		0	Transit
30/04/2019	1	MO	5	Red kite	1	11:52	32		32	Transit
30/04/2019	1	MO	6	Red kite	1	11:59	71		71	
30/04/2019	1	MO	7	Red kite	1	12:29	10		0	
30/04/2019	1	MO	8	Red kite	1	12:44	8		0	
30/04/2019	1	MO	9	Red kite	2	12:53	39		39	
30/04/2019	1	MO	10	Peregrine	1	13:55	76		76	
30/04/2019	1	MO	11	Red kite	1	15:23	80		75	Transit
30/04/2019	1	MO	12	Red kite	1	15:52	28		28	Transit
30/04/2019	1	MO	13	Red kite	1	16:25	32		0	Transit
30/04/2019	1	MO	14	Red kite	1	16:43	42		30	
30/04/2019	1	MO	15	Peregrine	1	17:17	19		19	
09/05/2019	2	ST	16	Red kite	1	13:47	169		169	
09/05/2019	2	ST	17	Kestrel	1	14:00	209		209	Hovering
09/05/2019	2	ST	18	Red kite	1	16:01	73		73	

Date	VP code	Surveyor	FlightID	Species	Num Birds	Obs Time	Flight (s)	time	Time at risk height (s)	comments
10/05/2019	2	ST	19	Red kite	2	12:37	177		177	
10/05/2019	2	ST	20	Red kite	1	13:10	182		182	
10/05/2019	2	ST	21	Red kite	1	14:40	150		150	Flew together then split
10/05/2019	2	ST	22	Red kite	1	14:40	163		163	Flew together then split
11/05/2019	1	MO	23	Curlew	1	12:14	21		0	
11/05/2019	1	MO	24	Red kite	1	12:46	38		38	
11/05/2019	1	MO	25	Red kite	2	12:52	258		75	Mutual Circling
11/05/2019	1	MO	26	Red kite	1	13:00	50		50	
11/05/2019	1	MO	27	Red kite	1	13:01	44		44	Different bird to above
11/05/2019	1	MO	28	Red kite	1	13:10	32		32	
11/05/2019	1	MO	29	Red kite	1	14:05	55		55	
11/05/2019	1	MO	30	Red kite	1	16:32	42		42	
11/05/2019	1	MO	31	Red kite	1	17:05	19		19	
11/05/2019	1	MO	32	Curlew	1	18:45	7		0	Brief song then flew. Likely territory.
06/06/2019	1	ST	33	Red kite	1	07:28	190		190	
24/06/2019	2	MO	34	Red kite	1	14:08	96		30	

Date	VP code	Surveyor	FlightID	Species	Num Birds	Obs Time	Flight (s)	time	Time at risk height (s)	comments
24/06/2019	2	MO	35	Hen harrier	1	17:07	107		0	Landed
24/06/2019	2	MO	36	Hen harrier	1	17:14	15		0	
25/06/2019	1	MO	37	Snipe	1	16:09	6		6	Drumming
25/06/2019	1	MO	38	Marsh harrier	1	16:32	38		0	Onto post
25/06/2019	1	MO	39	Marsh harrier	1	16:38	110		60	
25/06/2019	1	MO	40	Marsh harrier	1	17:11	8		0	Onto Post
25/06/2019	1	MO	41	Curlew	1	17:24	17		17	Singing Briefly
25/06/2019	1	MO	42	Marsh harrier	1	17:36	8		0	Out of view
25/06/2019	1	MO	43	Snipe	1	17:45	5		5	Drumming
25/06/2019	1	MO	44	Red kite	1	18:20	81		81	
25/06/2019	1	MO	45	Marsh harrier	1	18:37	152		0	
25/06/2019	1	MO	46	Red kite	1	18:50	33		33	
26/06/2019	1	MO	47	Red kite	1	12:26	11		0	
26/06/2019	1	MO	48	Red kite	1	12:39	24		24	

Date	VP code	Surveyor	FlightID	Species	Num Birds	Obs Time	Flight (s)	time	Time at risk height (s)	comments
26/06/2019	1	MO	49	Marsh harrier	1	13:02	62		0	
26/06/2019	1	MO	50	Marsh harrier	1	13:21	17		0	
26/06/2019	1	MO	51	Marsh harrier	1	13:24	16		0	Onto post
26/06/2019	1	MO	52	Marsh harrier	1	13:25	8		0	
18/07/2019	2	ST	53	Red kite	1	09:52	199		139	Circling
18/07/2019	2	ST	54	Red kite	1	10:07	221		221	Same as above, missing P2 L wing
18/07/2019	2	ST	55	Red kite	1	11:56	127		112	
18/07/2019	2	ST	56	Red kite	2	12:43	215		215	
18/07/2019	2	ST	57	Red kite	1	13:47	340		295	Hunting / Foraging
18/07/2019	2	ST	58	Red kite	1	14:15	60		60	
18/07/2019			59							
25/07/2019	1	MO	60	Red kite	1	11:15	32		32	heavily moulting
25/07/2019	1	MO	61	Peregrine	1	11:36	70		70	Distantly
25/07/2019	1	MO	62	Mallard	1	11:59	8		0	
25/07/2019	1	MO	63	Red kite	1	13:02	90		45	
25/07/2019	1	MO	64	Red kite	1	15:26	165		165	

Date	VP code	Surveyor	FlightID	Species	Num Birds	Obs Time	Flight (s)	time	Time at risk height (s)	comments
25/07/2019	1	MO	65	Red kite	2	15:59	48		30	
25/07/2019	1	MO	66	Curlew	1	16:34	42		42	calling
26/07/2019	2	MO	67	Red kite	1	06:26	40		0	
26/07/2019	2	MO	68	Red kite	1	07:20	68		68	
26/07/2019	2	MO	69	Red kite	1	10:57	42		0	
26/07/2019	2	MO	70	Red kite	1	10:58	48		0	
26/07/2019	2	MO	71	Red kite	1	11:11	121		121	
26/07/2019	2	MO	72	Red kite	1	11:49	98		98	
27/07/2019	1	MO	73	Kestrel	1	08:21	96		81	
27/07/2019	1	MO	74	Red kite	1	08:40	195		195	heavily moulting
27/07/2019	1	MO	75	Red kite	1	08:54	111		81	
12/08/2019	1	MO	76	Red kite	1	13:00	14		0	
12/08/2019	1	MO	77	Red kite	1	13:14	750		60	
13/08/2019	2	MO	78	Red kite	1	11:04	100		100	
13/08/2019	2	MO	79	Peregrine	1	15:47	40		40	

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