



CARRICK WINDFARM

APPENDIX 8.1

YEAR 1 BASELINE ORNITHOLOGY REPORT 2018-19

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ABBREVIATIONS

BoCC:	Birds of Conservation Concern
BOU:	British Ornithologists' Union
FAS:	Flight Activity Surveys
NBN:	National Biodiversity Network
SBL:	Scottish Biodiversity List
SPA:	Special Protection Area
SSSI:	Site of Special Scientific Interest
VP:	Vantage Point

1 INTRODUCTION

1.1 Background

Arcus Consultancy Services Ltd (Arcus) was commissioned by ScottishPower Renewables (hereafter referred to as 'the Applicant') to evaluate the ornithological interest at the proposed Carrick Windfarm (hereafter referred to as 'the Site'). The Site is located approximately 6km south of Straiton in South Ayrshire; the central co-ordinates of the Site are 237186, 598381. The Site Boundary is shown in Figure 1, Appendix 1.

Baseline Ornithology Surveys of the Site and surrounding area commenced in September 2018 and continued until August 2020. This report details the survey methods and results of the Year 1 baseline ornithology surveys (September 2018 to August 2019 inclusive). This document is supported by a Confidential Annex, which includes details of sensitive species.

Species names used in this report follow the British List¹, which is maintained by the British Ornithologists' Union (BOU), with all species referred to by their British (English) vernacular name. A list of scientific names, as well as details of relevant legislation and conservation status, of all bird species referred to in this report is provided in Table A2.1, Appendix 2.

1.2 Description of Site and Surrounding Area

The Site is largely comprised of coniferous plantation forestry, which is connected to larger extents of forestry to the south east and south west. A substantial area of open ground is present to the north and north east of the Site.

The wider area comprises a similar mosaic of plantation forestry and open ground, with numerous waterbodies of varying sizes.

1.3 Survey Area

The Site Boundary at the time of survey was considerably larger in area than the final Site Boundary (the red line boundary) as described above.

1.4 In light of the above, any further reference to the 'Site' within this appendix relates to the 'Site Boundary at the time of Survey' as presented as a green line boundary in Figure 1, in Appendix 8.1 Sites Designated for Ornithological Features.

1.4.1 Statutory Sites

A desk-study was undertaken for the following statutory designated sites:

- Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) within 10km of the Site, and;
- Special Protection Areas (SPAs) and Ramsar sites within 20km of the Site

Two statutory designated sites for ornithological features have been identified within 10km of the Site, both of which are SSSIs; details are summarised in Table 1. No SPAs or Ramsar sites designated for ornithological features are present within 20km.

Table 1 Summary of Statutory Sites Designated for Ornithological Interest, Listed in Order of Proximity

Site name	Designation	Approximate distance and direction from the Site*	Qualifying ornithological interests
Merrick Kells	SSSI	7.0km to south east	Breeding bird assemblage.

¹ British Ornithologists' Union. (2017). The British List: A Checklist of Birds of Britain (9th edition). *Ibis* 160: 190-240.

Bogton Loch	SSSI	8.75km to north east	Breeding bird assemblage.
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*From closest point

1.4.2 Non-statutory Sites

The Site is located within the Galloway Forest Park Important Bird Area (IBA), which is described in the factsheet (BirdLife International, 2020) as *"A very large area of forest, including lochs, rivers and moorland, that stretches from Newton Stewart in Dumfries and Galloway into the Strathclyde region. The IBA supports a range of breeding waders and waterbirds, in addition to species of forest and moorland."* The factsheet also lists three "trigger species", namely black grouse, peregrine and short-eared owl (BirdLife International, 2020). Although IBAs are considered to be sites of international significance for bird conservation, they are not statutory sites.

In addition, as detailed in Chapter 7: Ecology and Biodiversity of the EIAR, River Stinchar (Milton to Black Hill) Provisional Wildlife Site (WS), which is located in the south west of the Site, is noted for its breeding bird interest.

1.5 Consultation with NatureScot

A consultation letter was sent by Arcus to NatureScot² on 04 February 2019, in part to discuss ornithological sensitivities at the Site and the proposed survey scope.

In their response to this letter, NatureScot confirmed (via email dated 22 February 2019) that the proposed survey methods appeared appropriate, and provided additional comments relating to the ornithology surveys, to which Arcus responded via email dated 28 June 2019). Further clarifications were provided by NatureScot via email dated 23 July 2019. All relevant comments are detailed in Table 2 below.

Table 2 NatureScot Comments in Response to Ornithological Consultation, and Arcus responses

Topic	NatureScot comments (and date)	Arcus response to NatureScot (and date issued)
Nightjar	<i>"We are also inclined to specifically mention nightjar. We do not know if they are present within the site itself but they are believed to be spreading slowly within other forests to the south which are going through felling operations."</i> (22 February 2019)	<i>"As felling operations are taking place on Site, the potential for suitable habitat to be present does exist. Therefore, despite the Site not being in Dumfries and Galloway (where you mention Nightjar being present in forests going through felling operations) a precautionary desktop assessment was carried out when developing the survey scope.</i> <i>The desktop assessment confirmed that the Site lies over 25km north west of the closest probable (but unconfirmed) nightjar breeding location (The Bird Atlas³), and 15km east of the closest publicly available record (NBN⁴). Further discussions with our surveyor following Site visits reflected this understanding of the species with regards to the Site. However, as a precaution our surveyor carried out an evening</i>

² Formerly known as Scottish Natural Heritage (SNH).

³ Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. and Fuller, R.J., 2013. Bird Atlas 2007-11: *the breeding and wintering birds of Britain and Ireland*. Thetford: BTO.

⁴ This refers to the online National Biodiversity Network (NBN) Atlas: <https://nbnatlas.org/>

Topic	NatureScot comments (and date)	Arcus response to NatureScot (and date issued)
		<p>survey visit on the 20 June 2019 to scope for the species within any suitable habitats, with the intention to drop any further surveys if the species is not recorded during this visit. No nightjar were seen or heard during this survey. Therefore, we consider it unlikely that nightjar is present, and thus specific survey for them have not been included in the scope of works.</p> <p>We would be keen to know if NatureScot are in agreement with our assessment of the requirement of nightjar survey, or if they have any further information that would suggest otherwise?" (28 June 2019).</p>
	<p>"Nightjar survey methods are set out in Gilbert et al and require at least two survey visits from June into mid-July. A single visit in June does not meet this basic requirement and so it is not clear why the accepted survey protocol was not followed. Given this we cannot be certain that nightjar do not exist on the site or are not likely to. It would be preferable for this work to be repeated using appropriate survey methods as set out in Gilbert et al. As we are now past mid-July this survey work will now need to be undertaken in 2020." (23 July 2019)</p>	<p>Targeted nightjar surveys are planned for Year 2.</p>
Vantage Points (VPs)	<p>"Much of the area is currently used for commercial forestry, with the proposed vantage points either within forestry or very close to it. The information provided does not indicate at which height the view-sheds have been calculated at. Can you clarify this, please, and confirm that all areas within the viewshed are actually visible?" (22 February 2019)</p>	<p>"Viewshed are calculated at the topographic height of the VP location, plus one metre.</p> <p>The forestry on the Site is actively managed so shows a variety of stand heights, as well as large areas of clear fell, particular in the south.</p> <p>All VPs locations were chosen via a pre-survey recce, these were run through the viewshed model on GIS, and then 'ground-truthed', before VP surveys commenced. During this process, further VPs were added to ensure sufficient coverage (from 4 VPs to the existing 5 VPs).</p> <p>Surveys have confirmed that visibility is good for these locations, with no issues with forestry recorded." (28 June 2019).</p>
	<p>"View-sheds identified by GIS do not factor in the presence of trees. Depending on how far any VP is from the nearest stand of trees, visibility will be restricted at various heights depending on distance from the vantage point.</p>	<p>Yes, all viewsheds are visible from all VP locations. This has been ground-truthed by surveyors after being analysed using Geographic Information Systems (GIS).</p>

Topic	NatureScot comments (and date)	Arcus response to NatureScot (and date issued)
	<i>The statement that "Surveys have confirmed that visibility is good for these locations, with no issues of forestry recorded" does not fully explain how tree heights have been factored in? Can you confirm that the view sheds (down to 30m) are visible from all vantage points?" (23 July 2019).</i>	
Brown & Shepherd (Breeding Bird) Survey	<i>"The Brown & Shepherd method was designed for open ground habitats. We are assuming that you will adapt it, if need be, to arrive at a survey method that is suitable to the very mixed habitats at this site." (22 February 2019)</i>	<i>"Yes, the approach will be a modified Brown and Shepherd Method⁵, carried out in accordance with NatureScot guidance." (28 June 2019).</i>
Winter Surveys	<i>"The hen harrier flights suggest the possibility of a nearby roost so further survey work to clarify this should be considered. It would also be beneficial for you to contact the relevant raptor study group who may have information on nearby winter roosts." (23 July 2019)</i>	Winter Walkover Surveys undertaken during 2019/20 would aim to identify any hen harrier roosts within the Survey Area.

2 METHODS

Based on the habitats present within and around the Site, the ornithological sensitivities known to occur in the area and professional judgement, the 2018-19 baseline ornithology survey programme comprised the following:

- Flight Activity Surveys (FAS) (September 2018 to August 2019);
- Black Grouse Survey (March to May 2019);
- Breeding Raptor Survey (March to July 2019);
- Breeding Bird Survey (BBS) (April to July 2019); and
- Winter Walkover Survey (October 2018 to March 2019).

Full details of the methods followed for each of these surveys are provided below. Survey methods were based on current NatureScot guidance⁶, except where other methods are specified. Ornithological survey areas for the different surveys are presented in Figure 2, Appendix 1 and defined in further detail within the sections below.

2.1 Flight Activity Surveys

FAS were carried out between September 2018 and August 2019 (inclusive) using a series of watches from VPs overlooking the Site (Figure 3, Appendix 1) to record flight activity of target bird species. Target species included the following:

- all wild swan, goose and duck species (excluding mallard and Canada goose);

⁵ Brown, A.F. and Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study* 40: 189-195.

⁶ NatureScot (2017) *Recommended bird survey methods to inform impact assessment of onshore wind farms*, (version 2, March 2017). NatureScot.

- all raptors and owls listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)³ and/or Annex I of the Birds Directive⁷;
- all wader species; and
- black grouse.

The flight lines of all target species were recorded on large scale maps with the flight height of target species recorded at 15 second intervals. Based on the proposed wind turbine specifications, the three height bands used were:

- <30 m;
- 30-175 m; and
- >175 m.

In addition to recording target species flights, the number and activity of 'secondary' species was summarised every five-minutes during each Flight Activity Survey. Secondary species included the following: cormorant, all other raptors, all gulls, raven, and selected passerines in noteworthy numbers.

2.1.1 Vantage Point Locations

Five VP locations were identified to cover the area within the Site Boundary and an additional 500 m buffer (Figure 3, Appendix 1). All VPs locations were chosen via a pre-survey recce, these were run through the viewshed model on GIS, and then 'ground-truthed', before VP surveys commenced (see Table 2 for consultation with NatureScot).

It is acknowledged that VP 4 lies within the Site Boundary; surveyors working onsite concurrently were in regular contact with one another to ensure that there was no disturbance to any FAS from VP 4, thus avoiding the risk of disturbance affecting results of surveys from this VP.

With active forestry operations taking place widely across parts of the Site, it is expected that nesting birds in the area would already have developed a certain level of tolerance to background disturbance.

2.1.2 Survey Effort

Surveys were stratified to cover all times of day including dawn and dusk periods. Each watch lasted three hours with a 30-minute break in between watches. A breakdown of monthly survey effort is shown in Table 3. Full details of survey dates, times and hourly weather conditions are presented in Table A3.1, Appendix 3.

Table 3: Breakdown of Monthly FAS effort Completed between September 2018 and August 2019

Month and year	Number of survey hours				
	VP 1	VP 2	VP 3	VP 4	VP 5
Non-breeding season					
September 2018	6	6	6	6	6
October 2018	6	6	6	6	6
November 2018	6	6	6	6	6
December 2018	6	6	6	6	6
January 2019	6	6	6	6	6
February 2019	6	6	6	6	6

⁷ Directive 2009/147/EC on the conservation of wild birds: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

Month and year	Number of survey hours				
	VP 1	VP 2	VP 3	VP 4	VP 5
Total non-breeding season hours	36	36	36	36	36
Breeding Season					
March 2019	6	6	6	6	6
April 2019	6	6	6	6	6
May 2019	6	6	6	6	6
June 2019	6	6	6	6	6
July 2019	6	6	6	6	6
August 2019	6	6	6	6	6
Total breeding season hours	36	36	36	36	36

2.2 Black Grouse Surveys

Black Grouse Surveys were completed between mid-April and mid-May 2019, based on methods detailed in Gilbert *et al.* (1998)⁸. Surveys covered all potentially suitable lekking habitat within the Site Boundary and a surrounding 1.5km buffer of the Site Boundary. The Survey Area is shown in Figure 2, Appendix 1.

Survey visits included an initial assessment of suitable black grouse lekking habitats, and to further inform the requirements for further survey visits (April and May 2019), which sought to locate black grouse leks, and count the number of males present at each lek if necessary.

A third survey visit to determine the number of lekking males was not required, as no black grouse were recorded during Visit 2 in May 2019. Survey details are provided in Table 4. Full details of survey dates, times and hourly weather conditions are presented in Table A3.2, Appendix 3.

Table 4: Details of the 2019 Black Grouse Surveys

Survey month	Surveyor	Date	Sunrise time	Survey start time	Survey end time
April – Visit 1	Colin Nisbet	18/04/2019	05:58	06:00	08:00
	Iain Clark	18/04/2019	05:58	06:00	08:30
	Colin Nisbet	19/04/2019	05:56	06:00	08:30
	Iain Clark	19/04/2019	05:56	06:00	08:30
May – Visit 2	Colin Nisbet	13/05/2019	05:03	05:10	07:10
	Iain Clark	13/05/2019	05:03	05:10	07:10
	Colin Nisbet	17/05/2019	04:55	05:10	07:15
	Iain Clark	17/05/2019	04:55	05:10	07:15

2.3 Breeding Raptor Surveys

In line with NatureScot guidance⁶, walkover surveys and additional watches of suitable areas of breeding habitat were undertaken to detect the presence of target raptors and

⁸ Gilbert, G., Gibbons, D. W. and Evans, E. (2012) *Bird Monitoring Methods: A Manual of Techniques for Key UK Species*. Pelagic Publishing. ISBN 1-901930-03-3.

owls within 2km of the Site Boundary (1km for barn owl), following methods detailed in with Hardey *et al.* (2013)⁹.

Target raptor species included those associated with the habitats present within the Site; such as, osprey, goshawk, hen harrier, short-eared owl, and merlin as well as all other Annex I (EU Birds Directive) and Schedule 1 (Wildlife and Countryside Act) raptors.

The Survey Area is shown in Figure 2, Appendix 1 and survey details are presented in Table 5. Full details of survey dates, times and hourly weather conditions are presented in Table A3.3, Appendix 3.

Table 5 Details of the 2019 Breeding Raptor Surveys

Survey month	Surveyor	Date	Survey start time	Survey end time
April	Colin Nisbet and Iain Clark	08/04/2019	11:00	17:00
	Colin Nisbet and Iain Clark	11/04/2019	09:00	14:45
May	Iain Clark	16/05/2019	10:30	17:00
	Colin Nisbet and Iain Clark	23/05/2019	11:15	17:30
June	Colin Nisbet and Iain Clark	17/06/2019	09:00	15:00
	Colin Nisbet and Iain Clark	18/06/2019	09:00	15:00
July	Colin Nisbet and Iain Clark	25/07/2019	08:45	14:25
	Colin Nisbet and Iain Clark	26/07/2019	09:30	14:50

2.4 Breeding Bird Survey

A BBS was undertaken between April and July 2019 to map breeding birds, targeted within open moorland in the Survey Area. In line with NatureScot guidance⁵, the survey followed an adapted Brown and Shepherd (1993) method (designed to census upland breeding waders), with four survey visits undertaken to map territories of moorland birds of conservation concern as per NatureScot survey guidelines. The Survey Area is shown in Figure 2, Appendix 1 and survey details are presented in Table 6. Full details of survey dates, times and hourly weather conditions are presented in Table A3.4, Appendix 3.

Table 6 Details of the 2019 Breeding Bird Survey Visits

Visit	Surveyor	Date	Survey start time	Survey end time
1	Colin Nisbet and Iain Clark	18/04/2019	08:30	13:40
	Colin Nisbet and Iain Clark	19/04/2019	08:30	11:30
2	Colin Nisbet and Iain Clark	13/05/2019	07:30	12:15
	Colin Nisbet and Iain Clark	17/05/2019	07:15	14:00
3	Colin Nisbet and Iain Clark	20/06/2019	08:30	14:00
	Colin Nisbet and Iain Clark	21/06/2019	08:30	15:10
4	Colin Nisbet and Iain Clark	08/07/2019	08:30	14:00
	Colin Nisbet and Iain Clark	09/07/2019	08:45	14:30

⁹ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide to survey and monitoring, 3rd edition. NatureScot, Inverness

2.4.1 Breeding Territory Analysis

Upon completion of all four BBS visits, an analysis was completed to determine the number and approximate location of breeding territories of species of conservation concern, which are defined as species listed on one or more of the following:

- Annex I of the Birds Directive¹⁰;
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)¹¹;
- UK Birds of Conservation Concern (BoCC) Red or Amber list¹²; and
- birds listed on the Scottish Biodiversity List (SBL)¹³.

All registrations of species of conservation concern recorded on the field maps were transferred to produce 'species summary maps' from which the number and distribution of likely territories for each species could be determined. The method was based on that described by Bibby (2000)¹⁴, with an element of professional judgement.

A precautionary approach was followed with a bird deemed to be holding a territory if breeding behaviour (e.g. singing, alarm-calling, adults carrying food) was observed, or if pairs of birds were observed in suitable habitat, during just one of the four BBS visits. For certain species (e.g. common sandpiper and house sparrow), where a single bird was observed in the same area of suitable breeding habitat during multiple survey visits and it was considered likely that the species would be breeding, these registrations were also considered to represent a breeding territory.

2.5 Winter Walkover Survey

Walkover surveys of the Site and a 500m buffer of the Site Boundary was carried out twice between November 2018 and January 2019 to record wintering birds. The Survey Area is shown in Figure 2, Appendix 1. Full details of survey dates, times and hourly weather conditions are presented in Table A3.5, Appendix 3.

Table 7 Details of the 2018-19 Winter Walkover Surveys

Visit	Surveyor	Date	Survey start time	Survey end time
1	Frazer McFarlane	20/11/2018	09:05	16:10
2	Frazer McFarlane	29/01/2019	09:10	16:50

2.6 Survey Limitations

The majority of surveys were carried out in optimal weather conditions, with good visibility during diurnal surveys. However, the extensive survey programme meant that it was not always possible to avoid sub-optimal weather, especially when conditions varied from those forecast. This included periods of rain, mist and reduced visibility. It is considered that undertaking surveys in a range of conditions is more likely to capture bird activity that is representative of the Site and surrounding area. As such, weather conditions are not considered to represent a significant limitation to the robustness of the baseline data obtained.

¹⁰ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

¹¹ <http://www.legislation.gov.uk/ukpga/1981/69>

¹² Eaton, M.A., Aebischer, N.J., Brown, A., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A., and Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* 108, 708-746.

¹³ <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list>

¹⁴ Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000) Bird Census Techniques (2nd Edition)

3 RESULTS

3.1 Flight Activity Surveys

3.1.1 Target Species Flights

A total of 24 flights by seven identified target species were recorded during the FAS. Details of additional flights by three sensitive species are presented in the Confidential Annex. Of the target species summarised below, hen harrier was recorded most frequently (eleven flights (all during the non-breeding season)). Five pink-footed geese flights were recorded, all within the Site Boundary. All other species were recorded infrequently. A summary of all target species flights, broken down by species and season, is provided in Table 8. With the exception of sensitive species, full details of each target species flight are presented in Table A4.1, Appendix 4 and flight lines are shown in Figures 4 and 5, Appendix 1.

Table 8 Summary of target species flights recorded during the 2018-19 FAS

Species*	Flights in breeding season (Mar-Aug 2019)	Flights in non-breeding season (Sep 2018 - Feb 2019)	Total no. of flights	No. of birds per flight	Schedule 1/ Annex I listings	Conservation listing(s) ***	Corresponding figure no.
Pink-footed Goose	5	0	5	65-360		Amber	4
Black Grouse	0	2	2	4-5		Red; SBL	4
Grey Heron	0	1	1	1			4
Hen Harrier	0	11	11	1	Sch1.1 & 1A; Ann1	Red; SBL	5
Woodcock	0	2	2	1		Red; SBL	4
Snipe	0	1	1	1		Amber	4
Merlin	1	1	2	1	Sch1.1; Ann1	Red; SBL	5
Total no. of flights	6	18	24				

3.1.2 Secondary Species Registrations

Seven secondary species were recorded during the FAS, with buzzard and raven recorded most frequently. There were also regular registrations of kestrel and sparrowhawk, and occasional registrations of mallard, herring gull and black-headed gull. Secondary species were generally recorded in low numbers, with the majority of flights comprising single birds, and at most five individuals.

3.1.3 Incidental Records

A pair of goldeneye was recorded on Linfern Loch during a FAS visit in April 2019.

3.2 Black Grouse Survey

3.2.1 *Black Grouse Survey Results*

Suitable habitat for lekking black grouse was present within 1.5km of the Site Boundary, including areas of immature coniferous forestry and clearings, moorland and open rough grazing.

During targeted surveys to record lekking males, no black grouse were recorded. As no black grouse were recorded, only two survey visits were necessary in accordance with the method.

3.2.2 *Incidental Records*

Black grouse was recorded during Winter Walkover Surveys, with four adults in flight to the west of Knockcronal, along the woodland edge during Visit 1. During Visit 2, two males were recorded at the same location.

Black grouse was also recorded incidentally during a Breeding Raptor Survey, with one male observed at the Site Boundary at Black Row during Visit 3 in July 2019.

3.3 Breeding Raptor Surveys

3.3.1 *Target Raptor Species*

Details of sensitive breeding species are provided in the Confidential Annex. In addition, the following target raptor species was recorded during the 2019 Breeding Raptor Survey:

- Merlin: Occasional flights of both male and female individuals were recorded within the north west of the Survey Area. No evidence of breeding was recorded; however, there is suitable habitat for this species within the Survey Area.

3.3.2 *Secondary Species*

Three secondary species were observed during the surveys: buzzard, sparrowhawk and kestrel. Registrations of each species are briefly summarised below.

- Buzzard: frequently recorded, and several pairs were breeding within the Breeding Raptor Survey Area;
- Sparrowhawk: there were occasional registrations and the species was a confirmed to be breeding within the Breeding Raptor Survey Area; and
- Kestrel: there were regular registrations, and several pairs were breeding within the Breeding Raptor Survey Area.

3.4 Breeding Bird Survey

3.4.1 *Species of Conservation Concern*

Of the total 49 species recorded, 29 were of conservation concern, as defined in Section 2.4.1, including 15 species assessed as breeding¹⁵. Territories of these species are shown in Figures 6-8, Appendix 1. There were large numbers of breeding skylark and meadow pipit (45 and 35 territories respectively), while other species were recorded at low density. Notably, five crossbill territories were recorded, with further details provided in the Confidential Annex. No other breeding Schedule 1 species were recorded during the BBS. Numbers of territories of each of these species are provided in Table 9.

¹⁵ Defined as all birds that were potentially breeding (identified as described in Section 2.4.1), including birds that were defending or holding a territory (even if this was not subsequently occupied by any nesting birds) and regardless of the outcome (i.e. including birds that may have been unsuccessful in their breeding attempts).

No evidence of breeding was observed for the remaining thirteen species of conservation concern, which were as follows: goldeneye, golden plover, black-headed gull, great black-backed gull, herring gull, lesser black-backed gull, cuckoo, swift, house martin, spotted flycatcher, dipper, grey wagtail and pied wagtail. Registrations of these species are likely to include non-breeding birds, and birds from the local area which were breeding outside the BBS Area, although it is possible that small numbers of some of these species (e.g. spotted flycatcher, dipper, grey wagtail and pied wagtail) were breeding undetected within the BBS Area.

Notable registrations of non-breeding birds of conservation concern included approximately 115 golden plover during Visit 1, indicating that waders may use the Site for feeding/staging. Additionally, a group of goldeneye were recorded on Linfern Loch, which were recorded during Visit 1 prior to migrating to their breeding grounds.

Table 9 Summary of Species of Conservation Concern Assessed as Breeding During the 2019 BBS

Species*	Number of territories in BBS Area			Relevant legislation/conservation listings**	Corresponding Figure no.
	Within Site Boundary	In 500m buffer	Total		
Mallard	0	3	3	Amber	8
Teal	0	2	2	Amber	8
Snipe	0	2	2	Amber	8
Common Sandpiper	0	1	1	Amber	8
Skylark	3	42	45	Red; SBL	6
Willow Warbler	0	1	1	Amber	8
Grasshopper Warbler	0	1	1	Red; SBL	8
Mistle Thrush	1	2	3	Red	8
House Sparrow	0	2	2	Red; SBL	8
Meadow Pipit	3	32	35	Amber	7
Tree Pipit	0	6	6	Red; SBL	8
Lesser Redpoll	0	6	6	Red; SBL	8
Crossbill	3	2	5	Sch1.1	Confidential Annex
Siskin	1	1	2	SBL	8
Reed Bunting	0	1	1	Amber; SBL	8

Species*	Number of territories in BBS Area			Relevant legislation/ conservation listings**	Corresponding Figure no.
	Within Site Boundary	In 500m buffer	Total		
<p>*Species names and order follow the British List maintained by the BOU¹.</p> <p>** Sch1.1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)¹¹</p> <p>Red = UK Red-listed BoCC¹²; Amber = UK Amber-listed BoCC¹²; SBL = listed on the Scottish Biodiversity List¹³</p>					

3.4.2 Other Species

The remaining 20 species, which are generally common and widespread¹⁶, were as follows: Canada goose, tufted duck, pheasant, buzzard, woodpigeon, jackdaw, carrion crow, raven, coal tit, blue tit, sand martin, swallow, whitethroat, goldcrest, wren, robin, stonechat, wheatear, chaffinch and goldfinch. The majority of these species were confirmed or likely to have bred within the Survey Area.

Any common raptor species which are probable breeders within the Raptor Survey Area are discussed in Section 3.3.

3.5 Winter Walkover Survey

A total of 51 species were recorded during the Winter Walkover Survey. This included 26 species of conservation concern (as defined in Section 2.4.1), as summarised in Table 10 below. Species recorded were generally in low numbers, with lesser redpoll the most frequently recorded species (19 registrations). Key findings are summarised below:

- one hen harrier flight was recorded, with a single female hunting within the Survey Area;
- Goldeneye were recorded wintering on Linfern Loch; and,
- small numbers of fieldfare and redwing were recorded wintering within the Survey Area.

The remaining 25 species are common and widespread and considered to be of low conservation interest: goosander, red-breasted merganser, pheasant, grey heron, cormorant, sparrowhawk, buzzard, moorhen, coot, woodpigeon, great spotted woodpecker, jay, magpie, carrion crow, raven, coal tit, blue tit, great tit, long-tailed tit, goldcrest, wren, blackbird, robin, chaffinch and goldfinch.

Table 10 Species of conservation concern recorded during the 2018-19 Winter Walkover Surveys

Species*	Annex I / Schedule 1 listings	Conservation listings**	Maximum no. of birds observed***		Total***
			Visit 1 (Nov 2018)	Visit 2 (Jan 2019)	
Mallard		Amber	1	6	7
Goldeneye	Sch1.2	Amber	2	1	3
Snipe		Amber	3	1	4
Black Grouse		Red; SBL	4	2	6
Red Grouse		Amber; SBL	6	3	9

¹⁶ UK BoCC Green-listed species that are not afforded special protection under Annex I of the Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

Species*	Annex I/ Schedule 1 listings	Conservation listings**	Maximum no. of birds observed***		Total***
			Visit 1 (Nov 2018)	Visit 2 (Jan 2019)	
Hen Harrier	Sch1.1 & 1A; Ann1	Red; SBL	1	0	1
Woodcock		Red; SBL	1	2	3
Black-headed Gull		Amber; SBL	4	7	11
Great Black-backed Gull		Amber	6	4	10
Herring Gull		Red; SBL	2	8	10
Tawny Owl		Amber	1	1	2
Kestrel		Amber; SBL	1	2	3
Skylark		Red; SBL	1	0	1
Fieldfare	Sch1.1	Red	3	3	6
Redwing	Sch1.1	Red; SBL	3	5	8
Song Thrush		Red; SBL	1	0	1
Mistle Thrush		Red	2	0	2
Dipper		Amber	1	1	2
Dunnock		Amber; SBL	1	1	2
Grey Wagtail		Red	1	3	4
Pied Wagtail****		Amber	1	3	4
Bullfinch		Amber; SBL	2	5	7
Linnet		Red; SBL	4	0	4
Lesser Redpoll		Red; SBL	13	6	19
Siskin		SBL	6	5	11
Reed Bunting		Amber; SBL	2	4	6
<p>*Species names and order follow the British List maintained by the BOU¹.</p> <p>** Sch1.1 and Sch1A = Schedule 1 and 1A of the Wildlife and Countryside Act 1981 (as amended)¹¹</p> <p>Red = UK Red-listed BoCC¹²; Amber = UK Amber-listed BoCC¹²; SBL = listed on the Scottish Biodiversity List¹³</p> <p>***As there could be multiple registrations of the same individuals in different parts of the Survey Area, these numbers represent the maximum numbers of individuals observed</p> <p>****Two subspecies of pied wagtail occur in the UK: nominate <i>alba</i>, which is a passage migrant, and <i>yarrelli</i>, which breeds in the UK. Only the <i>yarrelli</i> subspecies is Amber-listed</p>					

4 SUMMARY OF KEY FINDINGS

4.1 Flight Activity by Target Species

A total of 37 flights by ten identified target species were recorded during the FAS (Figures 4 and 5, Appendix 1), with hen harrier the most frequently recorded species (11 flights), and five or fewer flights for each remaining species.

Hen harrier was recorded within the Site Boundary during the non-breeding season, with areas of open ground and forest edge regularly used by individuals for hunting; however, there was no evidence of any winter roosting.

Other notable registrations included five pink-footed goose flights during winter FAS, with flocks ranging in size from 65 birds to a peak of 360 individuals. All flight lines were recorded within the Site Boundary, with flocks flying northward.

4.2 Black Grouse Survey

There were no records of black grouse during targeted surveys for this species. However, black grouse was recorded incidentally during FAS, raptor surveys and WWO and there is suitable habitat for this species both within the Site Boundary and within 1.5km of the Site Boundary.

4.3 Breeding Raptor Surveys

Merlin was recorded during breeding raptor surveys, however there was no evidence that this species was breeding. In addition, several secondary raptor species were recorded, and are either confirmed or likely to be breeding within the Breeding Raptor Survey Area.

Information relating to additional Schedule 1 species is provided in the Confidential Annex.

4.4 Breeding Bird Surveys

The breeding bird community within the Site and surrounding 500m Buffer Area was typical of the Site location and habitats present. The only breeding wader species recorded were snipe (two territories) and common sandpiper (a single territory). Other breeding species of conservation concern included high numbers of skylark and meadow pipit territories (45 and 35 respectively) and small numbers of a range of other passerine and wildfowl species (Figures 6-8, Appendix 1). Details of breeding crossbill, which is a Schedule 1 species, are presented in the Confidential Annex.

4.5 Winter Walkover Survey

The wintering bird population was typical of the Site location and habitats present, and included small numbers of target species. No Schedule 1 raptor roosts or foraging wildfowl flocks were identified within the Survey Area (although as noted in Section 4.1, five pink-footed goose flights were recorded during the FAS).

APPENDIX 1 - FIGURES

Figure 1: Site Boundary

Figure 2: Ornithological Survey Areas

Figure 3: Vantage Point Locations and Viewsheds

Figure 4: Target Species Flights: Waders, Wildfowl and Black Grouse

Figure 5: Target Species Flights: Merlin and Hen Harrier

Figure 6: Breeding Bird Territories – Skylark

Figure 7: Breeding Bird Territories – Meadow Pipit

Figure 8: Breeding Bird Territories – Wildfowl, Waders and Passerines

APPENDIX 2 - BIRD SPECIES NAMES AND CONSERVATION DESIGNATIONS

Table A2.1 provides English vernacular and scientific names for all bird species named in this report. Taxonomic order and nomenclature is based on the BOU 'British List'¹.

Table A2.1 List of English Vernacular and Scientific Names of Bird Species Mentioned in this Report

Species*		Schedule 1/Annex I listings	Conservation listings**
English (British) vernacular name	Scientific name		
Canada Goose	<i>Branta canadensis</i>		
Pink-footed Goose	<i>Anser brachyrhynchus</i>		Amber
Mallard	<i>Anas platyrhynchos</i>		Amber
Teal	<i>Anas crecca</i>		Amber
Tufted Duck	<i>Aythya fuligula</i>		
Goosander	<i>Mergus merganser</i>		
Goldeneye	<i>Bucephala clangula</i>		Amber
Red-breasted Merganser	<i>Mergus serrator</i>		
Black Grouse	<i>Lyrurus tetrix</i>		Red; SBL
Red Grouse	<i>Lagopus</i>		Amber; SBL
Pheasant	<i>Phasianus colchicus</i>		
Grey Heron	<i>Ardea cinerea</i>		
Cormorant	<i>Phalacrocorax carbo</i>		
Osprey	<i>Pandion haliaetus</i>	Sch1.1; Ann1	Amber; SBL
Sparrowhawk	<i>Accipiter nisus</i>		
Hen Harrier	<i>Circus cyaneus</i>	Sch1.1 & 1A; Ann1	Red; SBL
Buzzard	<i>Buteo buteo</i>		
Moorhen	<i>Gallinula chloropus</i>		
Coot	<i>Fulica atra</i>		
Golden Plover	<i>Pluvialis apricaria</i>	Ann1	SBL
Woodcock	<i>Scolopax rusticola</i>		Red; SBL
Snipe	<i>Gallinago gallinago</i>		Amber
Common Sandpiper	<i>Actitis hypoleucos</i>		Amber
Black-headed Gull	<i>Chroicocephalus ridibundus</i>		Amber; SBL

Species*		Schedule 1/Annex I listings	Conservation listings**
English (British) vernacular name	Scientific name		
Great Black-backed Gull	<i>Larus marinus</i>		Amber
Herring Gull	<i>Larus argentatus</i>		Red; SBL
Lesser Black-backed Gull	<i>Larus fuscus</i>		Amber
Cuckoo	<i>Cuculus canorus</i>		Red; SBL
Tawny Owl	<i>Strix aluco</i>		Amber
Short-eared Owl	<i>Asio flammeus</i>	Ann1	Amber; SBL
Nightjar	<i>Caprimulgus europaeus</i>		
Swift	<i>Apus apus</i>		Amber; SBL
Great Spotted Woodpecker	<i>Dendrocopos major</i>		
Woodpigeon	<i>Columba palumbus</i>		
Kestrel	<i>Falco tinnunculus</i>		Amber; SBL
Merlin	<i>Falco columbarius</i>	Sch1.1; Ann1	Red; SBL
Jay	<i>Garrulus glandarius</i>		
Magpie	<i>Pica pica</i>		
Jackdaw	<i>Coloeus monedula</i>		
Carrion Crow	<i>Corvus corone</i>		
Raven	<i>Corvus corax</i>		
Coal Tit	<i>Parus ater</i>		
Blue Tit	<i>Cyanistes caeruleus</i>		
Great Tit	<i>Parus major</i>		
Skylark	<i>Alauda arvensis</i>		Red; SBL
Sand Martin	<i>Riparia riparia</i>		
Swallow	<i>Hirundo rustica</i>		
House Martin	<i>Delichon urbicum</i>		
Long-tailed Tit	<i>Aegithalos caudatus</i>		
Willow Warbler	<i>Phylloscopus trochilus</i>		Amber
Grasshopper Warbler	<i>Locustella naevia</i>		Red; SBL

Species*		Schedule 1/Annex I listings	Conservation listings**
English (British) vernacular name	Scientific name		
Whitethroat	<i>Sylvia communis</i>		
Goldcrest	<i>Regulus regulus</i>		
Wren	<i>Troglodytes troglodytes</i>		
Blackbird	<i>Turdus merula</i>		
Fieldfare	<i>Turdus pilaris</i>	Sch1.1	Red
Redwing	<i>Turdus iliacus</i>	Sch1.1	Red; SBL
Song Thrush	<i>Turdus philomelos</i>		Red; SBL
Mistle Thrush	<i>Turdus viscivorus</i>		Red
Spotted Flycatcher	<i>Muscicapa striata</i>		Red; SBL
Robin	<i>Erithacus rubecula</i>		
Stonechat	<i>Saxicola rubicola</i>		
Wheatear	<i>Oenanthe oenanthe</i>		
Dipper	<i>Cinclus cinclus</i>		Amber
House Sparrow	<i>Passer domesticus</i>		Red; SBL
Dunnock	<i>Prunella modularis</i>		Amber; SBL
Grey Wagtail	<i>Motacilla cinerea</i>		Red
Pied Wagtail	<i>Motacilla alba ssp. yarellii</i>		Amber***
Meadow Pipit	<i>Anthus pratensis</i>		Amber
Tree Pipit	<i>Anthus trivialis</i>		Red; SBL
Chaffinch	<i>Fringilla coelebs</i>		
Bullfinch	<i>Pyrrhula pyrrhula</i>		Amber; SBL
Linnet	<i>Linaria cannabina</i>		Red; SBL
Lesser Redpoll	<i>Acanthis cabaret</i>		Red; SBL
Crossbill	<i>Loxia curvirostra</i>	Sch1.1	
Goldfinch	<i>Carduelis carduelis</i>		
Siskin	<i>Spinus spinus</i>		SBL
Reed Bunting	<i>Emberiza schoeniclus</i>		Amber; SBL

Species*		Schedule 1/Annex I listings	Conservation listings**
English (British) vernacular name	Scientific name		
<p>*Species names and order follow the British List maintained by the BOU¹</p> <p>** Sch1.1 and Sch1A = Schedule 1 and 1A of the Wildlife and Countryside Act 1981 (as amended)¹¹, Ann1 = Annex I of the Birds Directive¹⁰, Red = UK BoCC Red list; Amber = UK BoCC Amber list, SBL = Scottish Biodiversity List¹³</p> <p>***Two subspecies of pied wagtail occur in the UK: nominate <i>alba</i>, which is a passage migrant, and <i>yarrelli</i>, which breeds in the UK. Only the <i>yarrelli</i> subspecies is Amber-listed.</p>			

APPENDIX 3 - ORNITHOLOGICAL SURVEY TIMES AND WEATHER CONDITIONS

Full details of the 2018-19 Ornithology Surveys, including hourly weather conditions, are presented below in Tables A3.1 to A3.5.

Table A3.1 Survey Times and Hourly Weather Conditions During the 2018-19 FAS

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
27/09/2018	VP 1	FMacF	13:35	17:35	1	3	SW	0	8	2	2	0	0	
27/09/2018	VP 1	FMacF	13:35	17:35	2	2	SW	0	8	2	2	0	0	
27/09/2018	VP 1	FMacF	13:35	17:35	3	2	SW	0	8	2	2	0	0	
29/09/2018	VP 1	FMacF	09:25	12:25	1	2	NW	0	8	2	2	0	0	
29/09/2018	VP 1	FMacF	09:25	12:25	2	3	NW	0	6	2	2	0	0	
29/09/2018	VP 1	FMacF	09:25	12:25	3	4	NW	0	4	2	2	0	0	
21/10/2018	VP 1	TD	08:00	11:00	1	2	WSW	1	8	0	0	0	0	mist + drizzle
21/10/2018	VP 1	TD	08:00	11:00	2	2	WSW	1	8	0	0	0	0	mist + drizzle
21/10/2018	VP 1	TD	08:00	11:00	3	2	WSW	1	8	1	1	0	0	clearing
21/10/2018	VP 1	TD	11:30	14:30	1	2	WSW	Not recorded						
21/10/2018	VP 1	TD	11:30	14:30	2	2	WSW							
21/10/2018	VP 1	TD	11:30	14:30	3	2	WSW							
12/11/2018	VP 1	TD	09:45	12:45	1	3	S	2	8	1	1	0	0	light rain
12/11/2018	VP 1	TD	09:45	12:45	2	3	S	2	8	1	1	0	0	light rain
12/11/2018	VP 1	TD	09:45	12:45	3	3	S	4	8	1	1	0	0	heavy rain
12/11/2018	VP 1	TD	13:15	16:15	1	3	S	5	8	1	1	0	0	heavy rain
12/11/2018	VP 1	TD	13:15	16:15	2	3	S	5	8	1	1	0	0	heavy rain
12/11/2018	VP 1	TD	13:15	16:15	3	3	S	4	8	1	1	0	0	light rain
10/12/2018	VP 1	TD	08:35	11:35	1	1	S	0	3	2	1	1	0	touch of ground frost

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
10/12/2018	VP 1	TD	08:35	11:35	2	1	S	0	3	2	2	1	0	touch of ground frost
10/12/2018	VP 1	TD	08:35	11:35	3	1	S	0	4	2	2	1	0	touch of ground frost
10/12/2018	VP 1	TD	12:05	15:05	1	1	S	0	8	6	2	1	0	
10/12/2018	VP 1	TD	12:05	15:05	2	1	S	0	8	7	2	0	0	
10/12/2018	VP 1	TD	12:05	15:05	3	1	S	0	8	8	2	0	0	
14/01/2019	VP 1	TD	09:50	12:50	1	2	SW	0	4	2	2	0	0	
14/01/2019	VP 1	TD	09:50	12:50	2	2	SW	0	6	2	2	0	0	
14/01/2019	VP 1	TD	09:50	12:50	3	2	SW	0	8	2	2	0	0	
14/01/2019	VP 1	TD	13:20	16:20	1	2	SW	0	8	2	2	0	0	
14/01/2019	VP 1	TD	13:20	16:20	2	2	SW	2	8	2	2	0	0	
14/01/2019	VP 1	TD	13:20	16:20	3	2	SW	2	8	2	2	0	0	
11/02/2019	VP 1	TD	07:55	10:55	1	2	S	0	3	2	1	0	0	
11/02/2019	VP 1	TD	07:55	10:55	2	2	S	0	2	2	2	0	0	
11/02/2019	VP 1	TD	07:55	10:55	3	2	S	0	2	2	2	0	0	
11/02/2019	VP 1	TD	11:25	14:25	1	2	S	0	4	2	2	0	0	
11/02/2019	VP 1	TD	11:25	14:25	2	2	S	0	5	2	2	0	0	
11/02/2019	VP 1	TD	11:25	14:25	3	2	S	0	5	2	2	0	0	
18/03/2019	VP 1	TD	12:00	15:00	1	2	SW	2	8	1	1	0	0	showers/mist over hills
18/03/2019	VP 1	TD	12:00	15:00	2	1	SW	2	8	1	1	0	0	showers/mist over hills
18/03/2019	VP 1	TD	12:00	15:00	3	1	SW	2	8	1	1	0	0	showers/mist over hills
18/03/2019	VP 1	TD	15:30	18:30	1	1	SW	2	8	1	1	0	0	drizzle
18/03/2019	VP 1	TD	15:30	18:30	2	1	SW	2	8	1	1	0	0	drizzle
18/03/2019	VP 1	TD	15:30	18:30	3	1	SW	2	8	2	1	0	0	drizzle

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
08/04/2019	VP 1	TD	13:35	16:35	1	4	NE	0	1	2	2	0	0	
08/04/2019	VP 1	TD	13:35	16:35	2	4	NE	0	1	2	2	0	0	
08/04/2019	VP 1	TD	13:35	16:35	3	3	NE	0	2	2	2	0	0	
08/04/2019	VP 1	TD	17:05	20:05	1	3	NE	0	2	2	2	0	0	
08/04/2019	VP 1	TD	17:05	20:05	2	3	NE	0	3	2	2	0	0	
08/04/2019	VP 1	TD	17:05	20:05	3	3	NE	0	3	2	2	0	0	
20/05/2019	VP 1	TD	05:05	08:05	1	2	NW	0	8	2	2	0	0	
20/05/2019	VP 1	TD	05:05	08:05	2	2	NW	0	8	2	2	0	0	
20/05/2019	VP 1	TD	05:05	08:05	3	2	NW	0	8	2	2	0	0	
20/05/2019	VP 1	TD	08:35	11:35	1	2	NW	0	8	2	2	0	0	
20/05/2019	VP 1	TD	08:35	11:35	2	3	NW	1	8	2	2	0	0	light shower
20/05/2019	VP 1	TD	08:35	11:35	3	3	NW	0	8	2	2	0	0	
17/06/2019	VP 1	TD	04:35	07:35	1	4	SSW	0	8	2	2	0	0	
17/06/2019	VP 1	TD	04:35	07:35	2	4	SSW	1	8	2	2	0	0	
17/06/2019	VP 1	TD	04:35	07:35	3	4	SSW	0	8	2	2	0	0	
17/06/2019	VP 1	TD	08:05	11:05	1	4	SSW	0	7	2	0	0	0	
17/06/2019	VP 1	TD	08:05	11:05	2	4	SSW	0	8	2	0	0	0	
17/06/2019	VP 1	TD	08:05	11:05	3	5	SSW	1	8	2	0	0	0	
15/07/2019	VP 1	TD	10:40	13:40	1	2	SSW	0	4	2	2	0	0	19 degrees
15/07/2019	VP 1	TD	10:40	13:40	2	2	SSW	0	3	2	2	0	0	19 degrees
15/07/2019	VP 1	TD	10:40	13:40	3	2	SSW	0	5	2	2	0	0	22 degrees
15/07/2019	VP 1	TD	14:10	17:10	1	1	SSW	0	3	2	2	0	0	23 degrees
15/07/2019	VP 1	TD	14:10	17:10	2	2	SSW	0	4	2	2	0	0	

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
15/07/2019	VP 1	TD	14:10	17:10	3	1	SSW	0	4	2	2	0	0	23 degrees
26/08/2019	VP 1	TD	06:10	09:10	1	2	SSW	0	3	2	2	0	0	
26/08/2019	VP 1	TD	06:10	09:10	2	2	SSW	0	3	2	2	0	0	
26/08/2019	VP 1	TD	06:10	09:10	3	2	SSW	0	2	2	2	0	0	
26/08/2019	VP 1	TD	09:50	12:50	1	2	SW	0	4	2	2	0	0	
26/08/2019	VP 1	TD	09:50	12:50	2	2	SW	0	4	2	2	0	0	
26/08/2019	VP 1	TD	09:50	12:50	3	3	SW	0	4	2	2	0	0	21 degrees
20/09/2018	VP 2	TD	12:45	15:45	1	2	SW	0	8	2	2	0	0	
20/09/2018	VP 2	TD	12:45	15:45	2	2	SW	0	8	2	2	0	0	
20/09/2018	VP 2	TD	12:45	15:45	3	2	SW	0	8	2	2	0	0	
20/09/2018	VP 2	TD	16:15	19:15	1	2	SW	0	8	2	2	0	0	
20/09/2018	VP 2	TD	16:15	19:15	2	2	SW	0	8	2	2	0	0	
20/09/2018	VP 2	TD	16:15	19:15	3	2	SW	0	8	2	1	0	0	
06/10/2018	VP 2	TD	07:30	10:30	1	1	SW	0	2	2	2	0	0	
06/10/2018	VP 2	TD	07:30	10:30	2	1	SW	0	2	2	2	0	0	
06/10/2018	VP 2	TD	07:30	10:30	3	1	SW	0	2	2	2	0	0	
06/10/2018	VP 2	TD	11:00	14:00	1	2	SW	0	3	2	2	0	0	
06/10/2018	VP 2	TD	11:00	14:00	2	2	SW	0	4	2	2	0	0	
06/10/2018	VP 2	TD	11:00	14:00	3	2	SW	0	4	2	2	0	0	
13/11/2018	VP 2	TD	09:45	12:45	1	2	SW	0	8	1	2	0	0	
13/11/2018	VP 2	TD	09:45	12:45	2	2	SW	0	8	1	3	0	0	
13/11/2018	VP 2	TD	09:45	12:45	3	2	SW	0	7	2	3	0	0	
13/11/2018	VP 2	TD	13:15	16:15	1	2	SW	0	5	2	3	0	0	

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
13/11/2018	VP 2	TD	13:15	16:15	2	2	SW	0	4	2	3	0	0	
13/11/2018	VP 2	TD	13:15	16:15	3	2	SW	0	4	2	3	0	0	
11/12/2018	VP 2	TD	08:35	11:35	1	2	ESE	1	8	1	0	0	0	misty/wet
11/12/2018	VP 2	TD	08:35	11:35	2	2	ESE	1	8	1	0	0	0	misty/wet
11/12/2018	VP 2	TD	08:35	11:35	3	2	ESE	1	8	1	1	0	0	misty/wet
11/12/2018	VP 2	TD	12:05	15:05	1	2	SSE	1	8	1	1	0	0	mist/rain
11/12/2018	VP 2	TD	12:05	15:05	2	2	SSE	0	8	2	1	0	0	
11/12/2018	VP 2	TD	12:05	15:05	3	2	SSE	0	8	2	1	0	0	
15/01/2019	VP 2	TD	09:50	12:50	1	4	SW	0	8	2	2	0	0	
15/01/2019	VP 2	TD	09:50	12:50	2	4	SW	0	8	2	2	0	0	
15/01/2019	VP 2	TD	09:50	12:50	3	4	SW	0	8	2	2	0	0	
15/01/2019	VP 2	TD	13:20	16:20	1	4	SW	0	8	2	2	0	0	
15/01/2019	VP 2	TD	13:20	16:20	2	4	SW	1	8	1	1	0	0	
15/01/2019	VP 2	TD	13:20	16:20	3	4	SW	1	8	1	0	0	0	
12/02/2019	VP 2	TD	07:50	10:50	1	4	SSW	2	8	1	1	0	0	
12/02/2019	VP 2	TD	07:50	10:50	2	4	SSW	0	7	2	2	0	0	
12/02/2019	VP 2	TD	07:50	10:50	3	4	SSW	0	7	2	2	0	0	
12/02/2019	VP 2	TD	11:20	14:20	1	4	SSW	0	8	2	2	0	0	
12/02/2019	VP 2	TD	11:20	14:20	2	4	SSW	0	5	2	2	0	0	
12/02/2019	VP 2	TD	11:20	14:20	3	4	SSW	0	5	2	2	0	0	
19/03/2019	VP 2	TD	12:00	15:20	1	2	SW	0	8	2	1	0	0	
19/03/2019	VP 2	TD	12:00	15:20	2	2	SW	0	8	1	1	0	0	
19/03/2019	VP 2	TD	12:00	15:20	3	2	SW	1	8	1	1	0	0	drizzle

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
19/03/2019	VP 2	TD	15:30	18:30	1	2	SW	1	8	1	1	0	0	drizzle
19/03/2019	VP 2	TD	15:30	18:30	2	2	SW	1	8	1	1	0	0	drizzle
19/03/2019	VP 2	TD	15:30	18:30	3	2	SW	1	8	1	0	0	0	
09/04/2019	VP 2	TD	13:40	16:40	1	3	E	0	3	2	3	0	0	
09/04/2019	VP 2	TD	13:40	16:40	2	3	E	0	4	2	2	0	0	
09/04/2019	VP 2	TD	13:40	16:40	3	3	E	0	4	2	2	0	0	
09/04/2019	VP 2	TD	17:10	20:10	1	3	E	0	4	2	2	0	0	
09/04/2019	VP 2	TD	17:10	20:10	2	3	E	0	5	2	2	0	0	
09/04/2019	VP 2	TD	17:10	20:10	3	3	E	0	3	2	1	0	0	
21/05/2019	VP 2	TD	05:00	08:00	1	1	WNW	0	8	2	2	0	0	
21/05/2019	VP 2	TD	05:00	08:00	2	1	WNW	0	7	2	2	0	0	
21/05/2019	VP 2	TD	05:00	08:00	3	1	WNW	0	7	2	2	0	0	
21/05/2019	VP 2	TD	08:30	11:30	1	1	WNW	0	6	2	2	0	0	
21/05/2019	VP 2	TD	08:30	11:30	2	2	W	0	7	2	2	0	0	
21/05/2019	VP 2	TD	08:30	11:30	3	2	W	0	6	2	2	0	0	
18/06/2019	VP 2	TD	04:30	07:30	1	2	S	0	5	2	2	0	0	
18/06/2019	VP 2	TD	04:30	07:30	2	2	S	0	6	2	2	0	0	
18/06/2019	VP 2	TD	04:30	07:30	3	2	S	0	6	2	2	0	0	
18/06/2019	VP 2	TD	08:00	11:00	1	2	S	0	7	2	2	0	0	
18/06/2019	VP 2	TD	08:00	11:00	2	3	S	0	8	2	2	0	0	
18/06/2019	VP 2	TD	08:00	11:00	3	3	S	0	8	2	2	0	0	
17/07/2019	VP 2	TD	12:00	15:00	1	1	SW	1	8	2	2	0	0	drizzle
17/07/2019	VP 2	TD	12:00	15:00	2	1	SW	1	8	1	1	0	0	drizzle/mist

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
17/07/2019	VP 2	TD	12:00	15:00	3	1	SW	1	8	1	1	0	0	drizzle/mist
17/07/2019	VP 2	TD	15:30	18:30	1	1	SW	1	8	2	2	0	0	drizzle
17/07/2019	VP 2	TD	15:30	18:30	2	1	SW	1	8	1	1	0	0	mist over hills
17/07/2019	VP 2	TD	15:30	18:30	3	1	SW	1	8	1	1	0	0	
27/08/2019	VP 2	TD	06:10	09:10	1	1	S	0	6	2	2	0	0	
27/08/2019	VP 2	TD	06:10	09:10	2	1	S	0	4	2	2	0	0	
27/08/2019	VP 2	TD	06:10	09:10	3	2	S	0	5	2	2	0	0	
27/08/2019	VP 2	TD	09:40	12:40	1	2	S	0	7	2	2	0	0	
27/08/2019	VP 2	TD	09:40	12:40	2	3	S	0	8	2	2	0	0	
27/08/2019	VP 2	TD	09:40	12:40	3	3	S	1	8	2	2	0	0	
28/09/2018	VP 3	FMacF	09:15	12:15	1	2	W	0	4	2	2	0	0	
28/09/2018	VP 3	FMacF	09:15	12:15	2	2	W	0	7	2	2	0	0	
28/09/2018	VP 3	FMacF	09:15	12:15	3	3	W	0	8	2	2	0	0	
29/09/2018	VP 3	FMacF	13:25	16:25	1	4	NW	0	7	2	2	0	0	
29/09/2018	VP 3	FMacF	13:25	16:25	2	4	NW	1	8	2	2	0	0	
29/09/2018	VP 3	FMacF	13:25	16:25	3	4	NW	0	5	2	2	0	0	
23/10/2018	VP 3	FMacF	13:15	16:15	1	3	SW	0	4	2	2	0	0	
23/10/2018	VP 3	FMacF	13:15	16:15	2	3	SW	0	4	2	2	0	0	
23/10/2018	VP 3	FMacF	13:15	16:15	3	3	SW	0	3	2	2	0	0	
24/10/2018	VP 3	FMacF	08:55	11:55	1	3	W	1	8	2	2	0	0	
24/10/2018	VP 3	FMacF	08:55	11:55	2	2	W	0	8	2	2	0	0	
24/10/2018	VP 3	FMacF	08:55	11:55	3	3	W	1	8	2	2	0	0	
14/11/2018	VP 3	TD	07:45	10:45	1	4	SW	5	8	0	0	0	0	misty + wet

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
14/11/2018	VP 3	TD	07:45	10:45	2	4	SW	5	8	0	0	0	0	misty + wet
14/11/2018	VP 3	TD	07:45	10:45	3	4	SW	5	8	1	1	0	0	mist clearing
14/11/2018	VP 3	TD	11:15	14:15	1	4	SW	4	8	1	1	0	0	drizzle/heavy rain
14/11/2018	VP 3	TD	11:15	14:15	2	4	SW	4	8	1	1	0	0	heavy rain
14/11/2018	VP 3	TD	11:15	14:15	3	4	SW	4	8	1	1	0	0	heavy rain
12/12/2018	VP 3	TD	09:20	12:20	1	2	SE	0	8	1	1	0	0	
12/12/2018	VP 3	TD	09:20	12:20	2	2	SE	1	8	1	1	0	0	
12/12/2018	VP 3	TD	09:20	12:20	3	3	SE	1	8	1	1	0	0	
12/12/2018	VP 3	TD	12:50	15:50	1	3	SE	0	8	1	1	0	0	
12/12/2018	VP 3	TD	12:50	15:50	2	3	SE	1	8	1	1	0	0	
12/12/2018	VP 3	TD	12:50	15:50	3	3	SE	1	8	2	2	0	0	
16/01/2019	VP 3	TD	08:25	11:25	1	4	SW	1	8	0	0	0	0	
16/01/2019	VP 3	TD	08:25	11:25	2	4	SW	1	8	1	1	0	0	
16/01/2019	VP 3	TD	08:25	11:25	3	4	SW	0	8	2	1	0	0	
16/01/2019	VP 3	TD	11:55	14:55	1	4	SW	0	6	2	3	0	0	
16/01/2019	VP 3	TD	11:55	14:55	2	4	SW	0	4	2	3	0	0	
16/01/2019	VP 3	TD	11:55	14:55	3	4	SW	0	4	2	3	0	0	
13/02/2019	VP 3	TD	10:50	13:50	1	4	SSW	0	8	1	1	0	0	low cloud on hill tops
13/02/2019	VP 3	TD	10:50	13:50	2	4	SSW	0	8	1	1	0	0	low cloud on hill tops
13/02/2019	VP 3	TD	10:50	13:50	3	4	SSW	0	8	1	1	0	0	low cloud on hill tops
13/02/2019	VP 3	TD	14:20	17:20	1	4	SSW	0	8	1	1	0	0	low cloud over hills
13/02/2019	VP 3	TD	14:20	17:20	2	4	SSW	0	8	1	1	0	0	low cloud over hills
13/02/2019	VP 3	TD	14:20	17:20	3	4	SSW	0	8	1	1	0	0	low cloud over hills

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
20/03/2019	VP 3	TD	06:25	09:25	1	1	SW	1	8	0	0	0	0	mist
20/03/2019	VP 3	TD	06:25	09:25	2	1	SW	1	8	0	1	0	0	mist
20/03/2019	VP 3	TD	06:25	09:25	3	1	SW	1	8	1	1	0	0	mist
20/03/2019	VP 3	TD	09:55	12:55	1	1	SW	1	8	1	1	0	0	mist on hill tops
20/03/2019	VP 3	TD	09:55	12:55	2	2	SW	1	8	1	2	0	0	mist clearing
20/03/2019	VP 3	TD	09:55	12:55	3	2	SW	1	8	1	2	0	0	mist clearing
10/04/2019	VP 3	TD	06:30	09:30	1	1	E	0	1		2	1	0	-2 degrees, ground frost
10/04/2019	VP 3	TD	06:30	09:30	2	1	E	0	1		2	1	0	ground frost
10/04/2019	VP 3	TD	06:30	09:30	3	1	E	0	1		2	0	0	
10/04/2019	VP 3	TD	10:00	13:00	1	1	E	0	1		2	0	0	
10/04/2019	VP 3	TD	10:00	13:00	2	1	E	0	2	2	2	0	0	
10/04/2019	VP 3	TD	10:00	13:00	3	1	E	0	2	2	2	0	0	
22/05/2019	VP 3	TD	15:05	18:05	1	3	W	0	3	2	2	0	0	
22/05/2019	VP 3	TD	15:05	18:05	2	3	W	0	3	2	2	0	0	
22/05/2019	VP 3	TD	15:05	18:05	3	3	W	0	3	2	2	0	0	
22/05/2019	VP 3	TD	18:35	21:35	1	3	W	0	3	2	2	0	0	
22/05/2019	VP 3	TD	18:35	21:35	2	3	W	0	4	2	2	0	0	
22/05/2019	VP 3	TD	18:35	21:35	3	3	W	0	4	2	2	0	0	
19/06/2019	VP 3	TD	15:35	18:35	1	3	W	0	4	2	2	0	0	
19/06/2019	VP 3	TD	15:35	18:35	2	3	W	0	3	2	2	0	0	
19/06/2019	VP 3	TD	15:35	18:35	3	3	W	0	4	2	2	0	0	
19/06/2019	VP 3	TD	19:05	22:05	1	3	W	0	5	2	2	0	0	
19/06/2019	VP 3	TD	19:05	22:05	2	3	W	1	7	2	2	0	0	

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
19/06/2019	VP 3	TD	19:05	22:05	3	3	W	1	8	1	1	0	0	rain from 21:35
16/07/2019	VP 3	TD	05:50	08:50	1	1	S	0	8	2	2	0	0	13.5 degrees
16/07/2019	VP 3	TD	05:50	08:50	2	1	S	0	8	2	2	0	0	
16/07/2019	VP 3	TD	05:50	08:50	3	1	S	0	8	2	2	0	0	16 degrees
16/07/2019	VP 3	TD	09:20	12:20	1	1	S	0	6	2	2	0	0	
16/07/2019	VP 3	TD	09:20	12:20	2	1	S	0	5	2	2	0	0	
16/07/2019	VP 3	TD	09:20	12:20	3	1	S	0	4	2	2	0	0	
29/08/2019	VP 3	TD	13:50	16:50	1	4	SW	1	8	1	1	0	0	low cloud on hills
29/08/2019	VP 3	TD	13:50	16:50	2	4	SW	0	8	2	2	0	0	
29/08/2019	VP 3	TD	13:50	16:50	3	4	SW	0	8	2	2	0	0	
29/08/2019	VP 3	TD	17:20	20:20	1	4	SW	0	8	2	2	0	0	
29/08/2019	VP 3	TD	17:20	20:20	2	4	SW	0	8	2	2	0	0	
29/08/2019	VP 3	TD	17:20	20:20	3	4	SW	0	6	2	2	0	0	
27/09/2018	VP 4	FMacF	09:35	12:35	1	3	SW	0	2	2	2	0	0	
27/09/2018	VP 4	FMacF	09:35	12:35	2	2	SW	1	8	2	2	0	0	
27/09/2018	VP 4	FMacF	09:35	12:35	3	2	SW	0	6	2	2	0	0	
28/09/2018	VP 4	FMacF	13:15	16:15	1	3	W	2	8	2	2	0	0	
28/09/2018	VP 4	FMacF	13:15	16:15	2	3	W	0	6	2	2	0	0	
28/09/2018	VP 4	FMacF	13:15	16:15	3	3	W	0	3	2	2	0	0	
23/10/2018	VP 4	FMacF	09:15	12:15	1	2	SW	1	8	2	2	0	0	
23/10/2018	VP 4	FMacF	09:15	12:15	2	3	SW	0	6	2	2	0	0	
23/10/2018	VP 4	FMacF	09:15	12:15	3	2	SW	0	5	2	2	0	0	
24/10/2018	VP 4	FMacF	12:55	15:55	1	2	W	0	6	2	Not recorded			

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
24/10/2018	VP 4	FMacF	12:55	15:55	2	2	W	1	8	2				
24/10/2018	VP 4	FMacF	12:55	15:55	3	3	W	0	6	2				
15/11/2018	VP 4	TD	07:45	10:45	1	4	SSE	1	8	0	0	0	0	drizzle /mist
15/11/2018	VP 4	TD	07:45	10:45	2	4	SSE	1	8	0	0	0	0	drizzle /mist
15/11/2018	VP 4	TD	07:45	10:45	3	4	SSE	1	8	0	0	0	0	drizzle /mist
15/11/2018	VP 4	TD	11:15	14:15	1	4	SSE	2	8	1	1	0	0	light rain
15/11/2018	VP 4	TD	11:15	14:15	2	4	SSE	0	8	1	2	0	0	dry
15/11/2018	VP 4	TD	11:15	14:15	3	4	SSE	0	8	1	2	0	0	dry
13/12/2018	VP 4	TD	09:20	12:20	1	4	SW	0	7	2	2	0	0	
13/12/2018	VP 4	TD	09:20	12:20	2	4	SW	0	7	2	2	0	0	
13/12/2018	VP 4	TD	09:20	12:20	3	4	SW	0	7	2	2	0	0	
13/12/2018	VP 4	TD	12:50	15:50	1	4	SW	0	7	2	2	0	0	
13/12/2018	VP 4	TD	12:50	15:50	2	4	SW	0	8	2	2	0	0	
13/12/2018	VP 4	TD	12:50	15:50	3	4	SW	0	8	2	1	0	0	
14/01/2019	VP 4	TD	11:50	14:50	1	1	NW	0	2	2	2	0	0	
14/01/2019	VP 4	TD	11:50	14:50	2	1	NW	0	2	2	2	0	0	
14/01/2019	VP 4	TD	11:50	14:50	3	1	NW	0	2	2	2	0	0	
17/01/2019	VP 4	TD	08:20	11:20	1	1	NW	0	1	2	1	1	0	ground frost
17/01/2019	VP 4	TD	08:20	11:20	2	1	NW	0	2	2	2	1	0	ground frost
17/01/2019	VP 4	TD	08:20	11:20	3	1	NW	0	2	2	2	0	0	
14/02/2019	VP 4	TD	10:50	13:50	1	5	S	0	8	2	2	0	0	
14/02/2019	VP 4	TD	10:50	13:50	2	5	S	0	8	2	2	0	0	
14/02/2019	VP 4	TD	10:50	13:50	3	5	S	0	8	2	2	0	0	

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
14/02/2019	VP 4	TD	14:20	17:20	1	Not recorded								
14/02/2019	VP 4	TD	14:20	17:20	2									
14/02/2019	VP 4	TD	14:20	17:20	3									
21/03/2019	VP 4	TD	06:25	09:25	1	3	SSW	1	8	1	1	0	0	
21/03/2019	VP 4	TD	06:25	09:25	2	3	SSW	0	8	2	1	0	0	
21/03/2019	VP 4	TD	06:25	09:25	3	3	SSW	0	8	2	2	0	0	
21/03/2019	VP 4	TD	09:55	12:55	1	3	SSW	0	8	2	2	0	0	
21/03/2019	VP 4	TD	09:55	12:55	2	3	SSW	0	8	2	2	0	0	
21/03/2019	VP 4	TD	09:55	12:55	3	3	SSW	0	8	2	2	0	0	
11/04/2019	VP 4	TD	06:30	09:30	1	1	SE	0	1	0	1	1	0	-1 degrees, ground frost
11/04/2019	VP 4	TD	06:30	09:30	2	1	SE	0	1	0	2	1	0	-1 degrees, ground frost
11/04/2019	VP 4	TD	06:30	09:30	3	1	SE	0	1	0	2	1	0	0 degrees, ground frost
11/04/2019	VP 4	TD	10:00	13:00	1	1	SE	0	2	2	2	0	0	
11/04/2019	VP 4	TD	10:00	13:00	2	2	SE	0	2	2	2	0	0	
11/04/2019	VP 4	TD	10:00	13:00	3	2	SE	0	2	2	2	0	0	
23/05/2019	VP 4	TD	15:05	18:05	1	2	SW	0	Not recorded	2	2	0	0	
23/05/2019	VP 4	TD	15:05	18:05	2	2	SW	0		2	2	0	0	
23/05/2019	VP 4	TD	15:05	18:05	3	2	SW	0		2	2	0	0	
23/05/2019	VP 4	TD	18:35	21:35	1	2	SW	0	Not recorded	2	2	0	0	
23/05/2019	VP 4	TD	18:35	21:35	2	2	SW	0		2	2	0	0	
23/05/2019	VP 4	TD	18:35	21:35	3	2	SW	0		2	2	0	0	
20/06/2019	VP 4	TD	15:35	18:35	1	2	SW	0	3	2	2	0	0	

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
20/06/2019	VP 4	TD	15:35	18:35	2	3	SW	0	4	2	2	0	0	
20/06/2019	VP 4	TD	15:35	18:35	3	3	SW	0	4	2	2	0	0	
20/06/2019	VP 4	TD	19:05	22:05	1	3	SW	0	3	2	2	0	0	
20/06/2019	VP 4	TD	19:05	22:05	2	3	SW	0	4	2	2	0	0	
20/06/2019	VP 4	TD	19:05	22:05	3	3	SW	0	4	2	2	0	0	
18/07/2019	VP 4	TD	05:05	08:05	1	3	SW	0	8	1	1	0	0	mist over hills
18/07/2019	VP 4	TD	05:05	08:05	2	3	SW	0	8	1	1	0	0	mist over hills
18/07/2019	VP 4	TD	05:05	08:05	3	3	SW	0	8	2	2	0	0	cleared
18/07/2019	VP 4	TD	08:35	11:35	1	3	SW	0	8	2	2	0	0	
18/07/2019	VP 4	TD	08:35	11:35	2	3	SW	0	8	2	2	0	0	
18/07/2019	VP 4	TD	08:35	11:35	3	3	SW	0	8	2	2	0	0	
28/08/2019	VP 4	TD	13:50	16:50	1	2	SSW	1	8	4	2	0	0	
28/08/2019	VP 4	TD	13:50	16:50	2	2	SSW	0	6	5	2	0	0	
28/08/2019	VP 4	TD	13:50	16:50	3	2	SSW	0	4	5	2	0	0	
28/08/2019	VP 4	TD	17:20	20:20	1	2	SSW	0	3	2	2	0	0	
28/08/2019	VP 4	TD	17:20	20:20	2	2	SSW	0	4	2	2	0	0	
28/08/2019	VP 4	TD	17:20	20:20	3	2	SSW	0	4	2	2	0	0	
27/09/2018	VP 4	FMacF	09:35	12:35	1	3	SW	0	2	2	2	0	0	
21/09/2018	VP 5	TD	07:05	10:05	1	4	W	1	8	1	1	0	0	drizzle
21/09/2018	VP 5	TD	07:05	10:05	2	4	W	1	8	1	1	0	0	drizzle
21/09/2018	VP 5	TD	07:05	10:05	3	4	W	1	8	1	1	0	0	drizzle
21/09/2018	VP 5	TD	10:35	13:35	1	4	W	1	8	1	1	0	0	drizzle
21/09/2018	VP 5	TD	10:35	13:35	2	4	W	1	8	1	1	0	0	drizzle

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
21/09/2018	VP 5	TD	10:35	13:35	3	4	W	1	8	1	1	0	0	drizzle
05/10/2018	VP 5	TD	12:15	15:15	1	1	W	0	4	2	2	0	0	
05/10/2018	VP 5	TD	12:15	15:15	2	2	W	0	4	2	2	0	0	
05/10/2018	VP 5	TD	12:15	15:15	3	2	W	0	3	2	2	0	0	
05/10/2018	VP 5	TD	15:45	18:45	1	2	W	0	3	2	2	0	0	
05/10/2018	VP 5	TD	15:45	18:45	2	2	W	0	2	2	2	0	0	
05/10/2018	VP 5	TD	15:45	18:45	3	2	W	0	2	2	1	0	0	
16/11/2018	VP 5	TD	07:50	10:50	1	2	SSE	0	8	2	1	0	0	
16/11/2018	VP 5	TD	07:50	10:50	2	2	SSE	0	8	2	2	0	0	
16/11/2018	VP 5	TD	07:50	10:50	3	2	SSE	0	8	2	2	0	0	
16/11/2018	VP 5	TD	11:20	14:20	1	2	SSE	0	8	2	2	0	0	
16/11/2018	VP 5	TD	11:20	14:20	2	2	SSE	0	8	2	2	0	0	
16/11/2018	VP 5	TD	11:20	14:20	3	2	SSE	0	8	2	2	0	0	
14/12/2018	VP 5	TD	09:20	12:20	1	3	SE	0	2	2	2	1	0	overnight frost
14/12/2018	VP 5	TD	09:20	12:20	2	3	SE	0	2	2	2	1	0	
14/12/2018	VP 5	TD	09:20	12:20	3	3	SE	0	3	2	2	1	0	
14/12/2018	VP 5	TD	12:50	15:50	1	3	SE	0	3	2	2	0	0	
14/12/2018	VP 5	TD	12:50	15:50	2	3	SE	0	3	2	2	1	0	
14/12/2018	VP 5	TD	12:50	15:50	3	3	SE	0	4	2	2	1	0	
18/01/2019	VP 5	TD	08:20	11:20	1	2	SE	2	5	1	1	0	0	
18/01/2019	VP 5	TD	08:20	11:20	2	3	SE	2	6	2	2	0	0	
18/01/2019	VP 5	TD	08:20	11:20	3	3	SE	0	6	2	2	0	0	
18/01/2019	VP 5	TD	11:50	14:50	1	3	SE	2	8	2	2	0	0	

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Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
18/01/2019	VP 5	TD	11:50	14:50	2	3	SE	0	8	2	2	0	0	
18/01/2019	VP 5	TD	11:50	14:50	3	3	SE	0	8	2	2	0	0	
15/02/2019	VP 5	TD	10:55	13:55	1	3	S	0	4	2	2	0	0	
15/02/2019	VP 5	TD	10:55	13:55	2	3	S	0	4	2	2	0	0	
15/02/2019	VP 5	TD	10:55	13:55	3	3	S	0	6	2	2	0	0	
15/02/2019	VP 5	TD	14:25	17:25	1	3	S	0	4	2	2	0	0	
15/02/2019	VP 5	TD	14:25	17:25	2	3	S	0	5	2	2	0	0	
15/02/2019	VP 5	TD	14:25	17:25	3	3	S	0	4	2	2	0	0	
22/03/2019	VP 5	TD	06:20	09:20	1	4	SW	1	8	1	1	0	0	low cloud on hilltop
22/03/2019	VP 5	TD	06:20	09:20	2	4	SW	0	8	2	2	0	0	
22/03/2019	VP 5	TD	06:20	09:20	3	4	SW	0	8	2	2	0	0	
22/03/2019	VP 5	TD	09:50	12:50	1	4	SW	0	8	2	2	0	0	
22/03/2019	VP 5	TD	09:50	12:50	2	4	SW	1	8	2	2	0	0	
22/03/2019	VP 5	TD	09:50	12:50	3	4	SW	0	8	2	2	0	0	
12/04/2019	VP 5	TD	06:25	09:25	1	2	SE	0	1		1	1	0	slight ground frost
12/04/2019	VP 5	TD	06:25	09:25	2	2	SE	0	1		2	1	0	
12/04/2019	VP 5	TD	06:25	09:25	3	2	SE	0	1		2	0	0	
12/04/2019	VP 5	TD	09:55	12:55	1	2	SE	0	2	2	2	0	0	
12/04/2019	VP 5	TD	09:55	12:55	2	2	SE	0	2	2	2	0	0	
12/04/2019	VP 5	TD	09:55	12:55	3	2	SE	0	2	2	2	0	0	
24/05/2019	VP 5	TD	15:15	18:15	1	2	WSW	0	3	2	2	0	0	
24/05/2019	VP 5	TD	15:15	18:15	2	2	WSW	0	3	2	2	0	0	
24/05/2019	VP 5	TD	15:15	18:15	3	2	WSW	0	4	2	2	0	0	

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
24/05/2019	VP 5	TD	18:45	21:45	1	2	WSW	0	4	2	2	0	0	
24/05/2019	VP 5	TD	18:45	21:45	2	2	WSW	0	3	2	2	0	0	
24/05/2019	VP 5	TD	18:45	21:45	3	2	WSW	0	4	2	2	0	0	
21/06/2019	VP 5	TD	15:30	18:30	1	2	W	0	3	2	2	0	0	
21/06/2019	VP 5	TD	15:30	18:30	2	2	W	0	2	2	2	0	0	
21/06/2019	VP 5	TD	15:30	18:30	3	2	W	0	3	2	2	0	0	
21/06/2019	VP 5	TD	19:00	22:00	1	2	W	0	4	2	2	0	0	
21/06/2019	VP 5	TD	19:00	22:00	2	2	W	0	3	2	2	0	0	
21/06/2019	VP 5	TD	19:00	22:00	3	2	W	0	3	2	2	0	0	
19/07/2019	VP 5	TD	06:25	09:25	1	2	SW	0	3	2	2	0	0	
19/07/2019	VP 5	TD	06:25	09:25	2	2	SW	0	2	2	2	0	0	
19/07/2019	VP 5	TD	06:25	09:25	3	2	SW	0	4	2	2	0	0	
19/07/2019	VP 5	TD	09:55	12:55	1	2	SSW	0	6	2	2	0	0	
19/07/2019	VP 5	TD	09:55	12:55	2	2	SSW	0	8	2	2	0	0	
19/07/2019	VP 5	TD	09:55	12:55	3	2	SSW	0	8	2	2	0	0	
30/08/2019	VP 5	TD	13:45	16:45	1	5	SSW	1	8	2	2	0	0	drizzle/windy
30/08/2019	VP 5	TD	13:45	16:45	2	5	SSW	3	8	2	1	0	0	heavy showers/ windy
30/08/2019	VP 5	TD	13:45	16:45	3	5	SSW	3	8	2	2	0	0	heavy showers/ windy
30/08/2019	VP 5	TD	17:15	20:15	1	5	SSW	3	8	2	2	0	0	heavy shower/windy
30/08/2019	VP 5	TD	17:15	20:15	2	5	SSW	3	8	2	2	0	0	heavy showers/ windy
30/08/2019	VP 5	TD	17:15	20:15	3	5	SSW	3	8	2	1	0	0	heavy showers/ windy
Key:														
• Observer: TD = Tim Drew; FMacF = Fraser McFarlane														

Date	VP	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow	Notes
<ul style="list-style-type: none"> • Wind speed: according to Beaufort Scale • Wind direction: according to 16-point compass • Rain: 0 = None; 1 = Drizzle/Mist; 2 = Light showers; 3 = Heavy showers; 4 = Light rain; 5 = Heavy rain • Cloud cover: in eighths of sky (oktas) • Cloud height: 0 = <150 m; 1 = 150-500 m; 2 = >500 m • Visibility: 0 = Poor (<1km); 1 = Moderate (1-2km); 2 = Good (>2km) • Frost: 0 = None; 1 = Ground frost; 2 = All day frost • Snow: 0 = None; 1 = Onsite; 2 = On high ground 														

Table A3.2 Survey Times and Hourly Weather Conditions During the 2019 Black Grouse Surveys

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
18/04/2019	CN	06:00	08:00	1	2	SE	0	0	0	2	0	0
18/04/2019	CN	06:00	08:00	2	2	SE	0	0	0	2	0	0
18/04/2019	CN	06:00	08:00	3	2	SE	0	0	0	2	0	0
18/04/2019	IC	06:00	08:30	1	1	SE	0	0	0	2	0	0
18/04/2019	IC	06:00	08:30	2	2	SE	0	0	0	2	0	0
18/04/2019	IC	06:00	08:30	3	2	SE	0	0	0	2	0	0
19/04/2019	CN	06:00	08:30	1	0	SE	0	0	2	2	0	0
19/04/2019	CN	06:00	08:30	2	0	SE	0	0	2	2	0	0
19/04/2019	CN	06:00	08:30	3	0	SE	0	0	2	2	0	0
19/04/2019	IC	06:00	08:30	1	0	SE	0	0	2	2	0	0
19/04/2019	IC	06:00	08:30	2	0	SE	0	0	2	2	0	0

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
13/05/2019	CN	05:10	07:10	1	1	W	0	0	2	2	0	0
13/05/2019	CN	05:10	07:10	2	1	W	0	0	2	2	0	0
13/05/2019	IC	05:10	07:10	1	1	W	0	0	2	2	0	0
13/05/2019	IC	05:10	07:10	2	1	W	0	0	2	2	0	0
17/05/2019	CN	05:10	07:15	1	1	NE	0	8	2	2	0	0
17/05/2019	CN	05:10	07:15	2	2	NE	1	8	2	2	0	0
17/05/2019	CN	05:10	07:15	3	2	NE	0	8	2	2	0	0
17/05/2019	IC	05:10	07:15	1	1	NE	0	8	2	2	0	0
17/05/2019	IC	05:10	07:15	2	2	NE	1	8	2	2	0	0
17/05/2019	IC	05:10	07:15	3	2	NE	0	8	2	2	0	0

Table A3.3 Survey times and hourly weather conditions during the 2019 Breeding Raptor Surveys

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
08/04/2019	CN & IC	11:00	17:00	1	2	W	0	0	2	2	0	0
08/04/2019	CN & IC	11:00	17:00	2	2	W	0	0	2	2	0	0
08/04/2019	CN & IC	11:00	17:00	3	2	W	0	0	2	2	0	0
08/04/2019	CN & IC	11:00	17:00	4	2	W	0	0	2	2	0	0
08/04/2019	CN & IC	11:00	17:00	5	2	W	0	0	2	2	0	0
08/04/2019	CN & IC	11:00	17:00	6	2	W	0	0	2	2	0	0
11/04/2019	CN & IC	09:00	14:45	1	2	WSW	0	2	2	2	0	0
11/04/2019	CN & IC	09:00	14:45	2	2	WSW	0	4	2	2	0	0

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
11/04/2019	CN & IC	09:00	14:45	3	2	WSW	0	4	2	2	0	0
11/04/2019	CN & IC	09:00	14:45	4	3	WSW	0	1	2	2	0	0
11/04/2019	CN & IC	09:00	14:45	5	2	WSW	0	4	2	2	0	0
11/04/2019	CN & IC	09:00	14:45	6	2	WSW	0	3	2	2	0	0
16/05/2019	IC	10:30	17:00	1	1	NE	0	0	2	2	0	0
16/05/2019	IC	10:30	17:00	2	1	NE	0	0	2	2	0	0
16/05/2019	IC	10:30	17:00	3	1	NE	0	0	2	2	0	0
16/05/2019	IC	10:30	17:00	4	1	NE	0	0	2	2	0	0
16/05/2019	IC	10:30	17:00	5	2	NE	0	0	2	2	0	0
16/05/2019	IC	10:30	17:00	6	2	NE	0	0	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	1	2	WNW	0	3	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	2	2	WNW	0	3	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	3	2	WNW	0	3	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	4	2	WNW	0	4	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	5	2	WNW	0	4	2	2	0	0
23/05/2019	CN & IC	11:15	17:30	6	2	WNW	0	4	2	2	0	0

Table A3.4 Survey times and hourly weather conditions during the 2019 BBS

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
18/04/2019	CN & IC	08:30	13:40	1	2	SE	0	0	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	2	2	SE	0	1	2	2	0	0

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
18/04/2019	CN & IC	08:30	13:40	3	2	SE	0	3	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	4	2	SE	0	4	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	5	2	SE	0	4	2	2	0	0
19/04/2019	CN & IC	08:30	11:30	1	0	SE	0	1	2	2	0	0
19/04/2019	CN & IC	08:30	11:30	2	0	SE	0	1	2	2	0	0
19/04/2019	CN & IC	08:30	11:30	3	1	SE	0	1	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	1	2	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	2	3	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	3	2	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	4	3	W	0	0	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	1	6	NE	1	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	2	4	NE	2	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	3	3	NE	1	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	4	3	NE	0	6	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	5	3	NE	0	4	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	6	3	NE	0	2	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	1	3	SW	0	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	2	3	SW	2	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	3	3	SW	0	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	4	3	SW	3	6	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	5	3	SW	0	7	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	1	3	SW	0	5	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	2	3	SW	0	5	2	2	0	0

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Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
21/06/2019	CN & IC	08:30	15:10	3	3	SW	0	5	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	4	3	SW	0	8	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	5	3	SW	0	3	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	6	4	SW	1	7	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	1	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	2	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	3	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	4	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	5	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	6	1	SW	0	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	1	2	SW	0	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	2	2	SW	0	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	3	2	SW	0	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	4	3	SW	1	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	5	2	SW	0	8	2	2	0	0
09/07/2019	CN & IC	08:45	14:30	6	2	SW	0	8	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	1	2	SE	0	0	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	2	2	SE	0	1	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	3	2	SE	0	3	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	4	2	SE	0	4	2	2	0	0
18/04/2019	CN & IC	08:30	13:40	5	2	SE	0	4	2	2	0	0
19/04/2019	CN & IC	08:30	11:30	1	0	SE	0	1	2	2	0	0
19/04/2019	CN & IC	08:30	11:30	2	0	SE	0	1	2	2	0	0

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
19/04/2019	CN & IC	08:30	11:30	3	1	SE	0	1	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	1	2	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	2	3	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	3	2	W	0	0	2	2	0	0
13/05/2019	CN & IC	07:30	12:15	4	3	W	0	0	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	1	6	NE	1	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	2	4	NE	2	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	3	3	NE	1	8	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	4	3	NE	0	6	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	5	3	NE	0	4	2	2	0	0
17/05/2019	CN & IC	07:15	14:00	6	3	NE	0	2	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	1	3	SW	0	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	2	3	SW	2	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	3	3	SW	0	4	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	4	3	SW	3	6	2	2	0	0
20/06/2019	CN & IC	08:30	14:00	5	3	SW	0	7	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	1	3	SW	0	5	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	2	3	SW	0	5	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	3	3	SW	0	5	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	4	3	SW	0	8	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	5	3	SW	0	3	2	2	0	0
21/06/2019	CN & IC	08:30	15:10	6	4	SW	1	7	2	2	0	0

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
08/07/2019	CN & IC	08:30	14:00	1	1	SW	0	8	2	2	0	0
08/07/2019	CN & IC	08:30	14:00	2	1	SW	0	8	2	2	0	0

Table A3.5 Survey times and hourly weather conditions during the 2018-19 Winter Walkover Survey

Date	Observer	Survey start time	Survey end time	Hour	Wind speed	Wind direction	Rain	Cloud cover	Cloud height	Visibility	Frost	Snow
22/11/2018	FMaCF	09:05	16:10	1	3	SW	1	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	2	2	SW	0	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	3	3	SW	1	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	4	4	SW	1	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	5	4	SW	0	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	6	3	SW	0	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	7	3	SW	0	8	2	2	0	0
22/11/2018	FMaCF	09:05	16:10	8	4	SW	1	8	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	1	2	SW	1	8	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	2	2	SW	0	7	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	3	3	SW	0	7	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	4	3	SW	0	6	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	5	3	SW	0	6	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	6	3	SW	0	6	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	7	2	SW	2	6	2	2	0	0
31/01/2019	FMaCF	09:10	16:50	8	3	SW	2	6	2	2	0	0

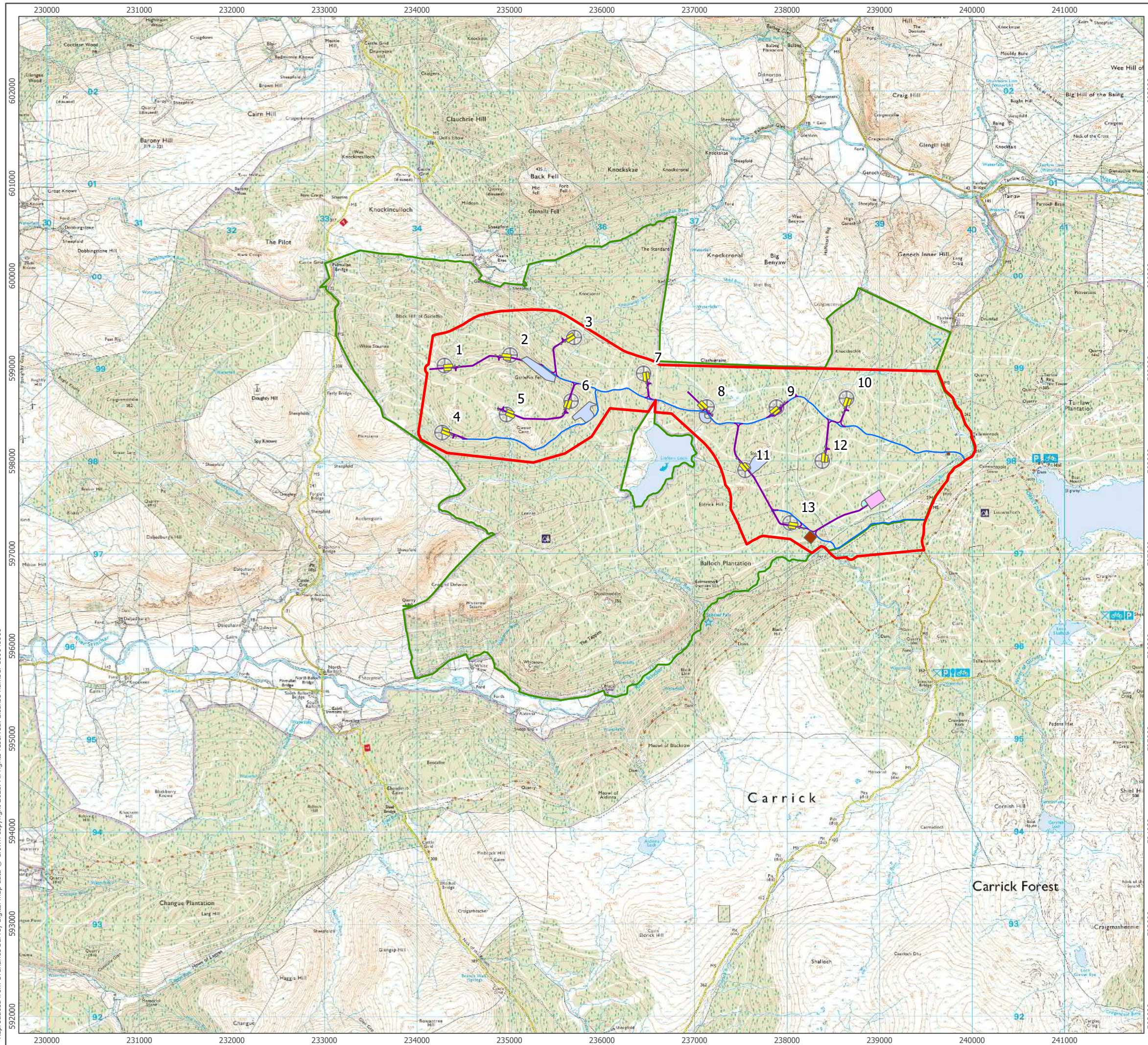
APPENDIX 4 - DETAILS OF TARGET SPECIES FLIGHTS












With the exception of sensitive species, details of each target species flight recorded during the 2018-19 FAS are presented below in Table A4.1; any flights for sensitive species are detailed in the Confidential Annex.

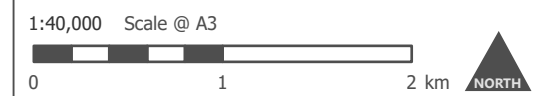
Table A4.1 Details of each target species flight recorded during the 2018-19 Flight Activity Surveys, listed by species

Species*	VP	Observer**	Date	Flight start time	Flight duration (s)	Minimum no. of birds	Key no.***	Notes
Pink-footed Goose	VP 5	TD	12/04/2019	06:54	218	65	200	heading north
	VP 5	TD	12/04/2019	07:10	225	190	201	heading north
	VP 3	TD	10/04/2019	06:46	248	115	220	heading north
	VP 4	TD	11/04/2019	06:49		360	225	heading north west
	VP 4	TD	11/04/2019	12:11	245	110	231	heading north calling
Black Grouse	VP 2	TD	06/10/2018	07:55	111	5	110	
	VP 3	FMacF	23/10/2018	14:21	17	4	115	
Grey Heron	VP 1	FMacF	27/09/2018	13:56	98	1	103	
Hen Harrier								female, adult, foraging over open rough grazing ground by Halfway Rig lost from view behind outcrop of Big Benyaw
	VP 3	FMacF	28/09/2018	09:47	32	1	105	
	VP 3	FMacF	28/09/2018	10:07	68	1	106	ringtail, immature, hunting open ground and forest edge on top of Genoch Burn - lost from view behind forest plantation
	VP 5	TD	05/10/2018	14:47	250	1	109	ringtail, hunting low over Site
	VP 3	FMacF	23/10/2018	13:57	56	1	114	foraging ringtail, flying west over open ground, to Wee Benyaw
	VP 3	TD	14/11/2018	11:28	250	1	124	adult male hunting and flying over forestry
	VP 4	TD	15/11/2018	13:09	271	1	127	ringtail hunting low + lost to view
	VP 3	TD	12/12/2018	15:09	198	1	138	hunting low over site
	VP 4	TD	13/12/2018	09:25	185	1	139	ringtail low over site

Species*	VP	Observer**	Date	Flight start time	Flight duration (s)	Minimum no. of birds	Key no.***	Notes
	VP 4	TD	13/12/2018	15:11	270	1	142	ringtail hunting over site
	VP 2	TD	15/01/2019	14:54	251	1	145	ringtail hunting low
	VP 4	TD	17/01/2019	08:38	238	1	147	
Woodcock	VP 3	TD	14/11/2018	14:01	30	1	125	flew from ground into forestry
	VP 3	TD	13/02/2019	11:52	20	1	154	
Snipe	VP 3	FMacF	24/10/2018	09:09	12	1	118	flushed from stream as quadbike passes
Merlin	VP 5	TD	15/02/2019	14:58	37	1	157	
	VP 5	TD	19/07/2019	06:38	38	1	183	low and fast heading north
*Species names and order follow the British List maintained by the BOU ¹ **Observer: TD =Tim Drew; FMacF = Fraser MacFarlane ***Key numbers allow identification of individual flights, and correspond with the numbers shown on Figures 4 and 5, Appendix 1								



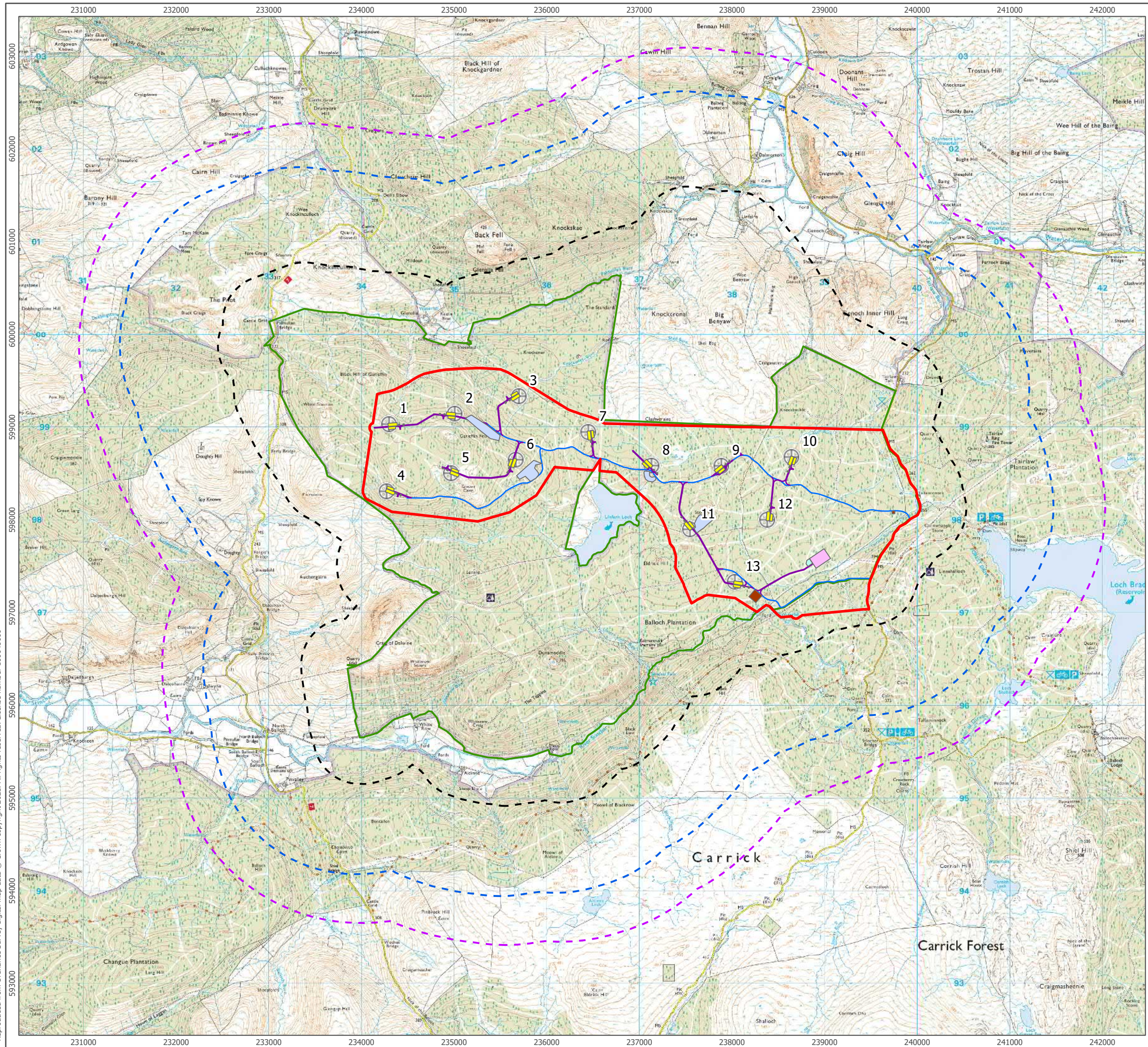
-  Site Boundary
-  Site Boundary at time of surveys
-  Wind Turbines
-  Cranepad
-  Hardstanding
-  SPEN Compound
-  Temporary Construction Compound
-  Substation Compound
-  Access Track New
-  Access Track Upgrade
-  Borrow Pit Search Areas

















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Site Boundary
Figure 1, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**



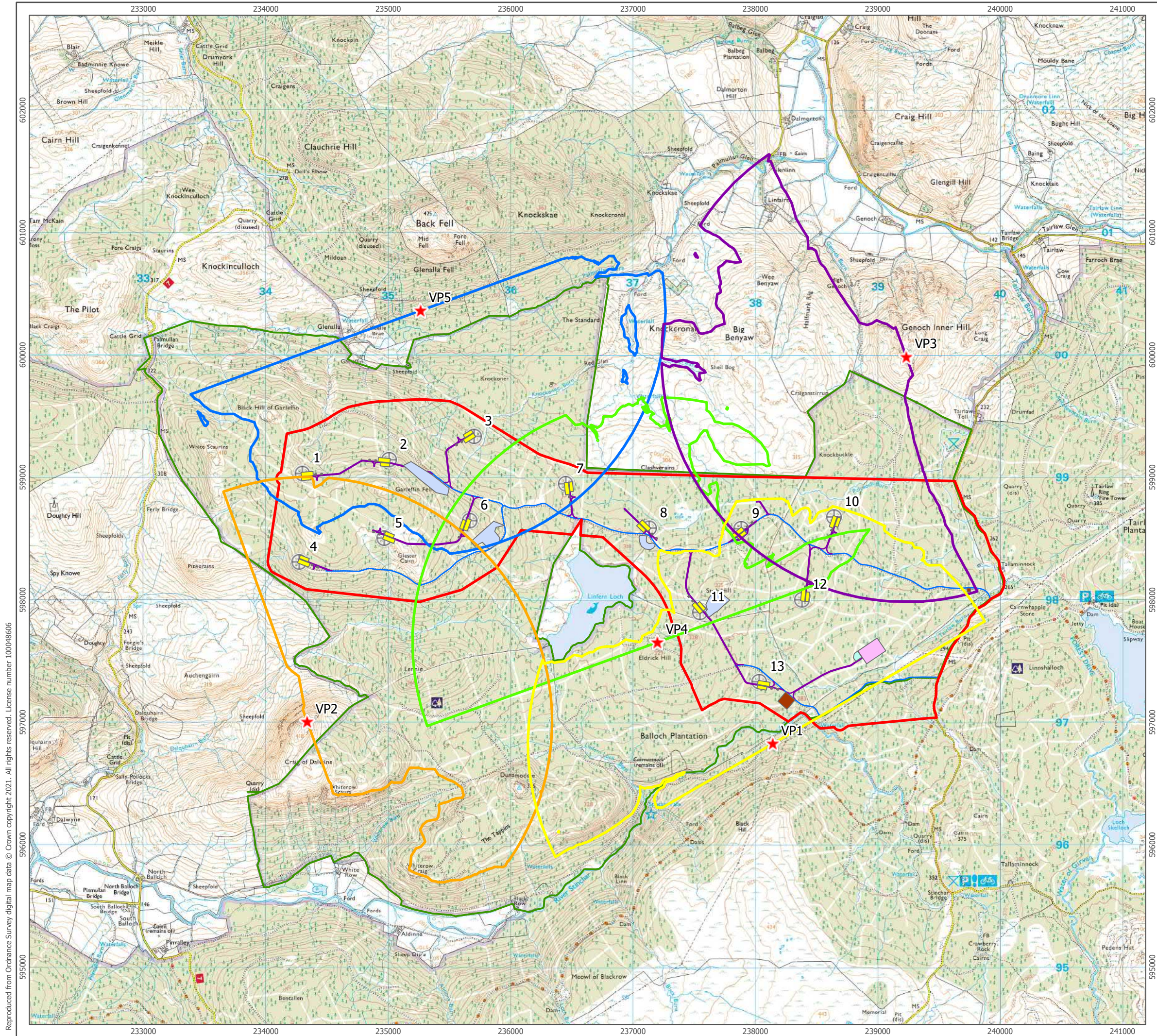
-  Site Boundary
-  Site Boundary at time of surveys
-  500 m Buffer - Breeding Bird Survey, Nightjar Survey and Winter Walkover Survey
-  1500 m Buffer - Black Grouse Survey
-  2000 m Buffer - Breeding Raptor Survey
-  Wind Turbines
-  Cranepad
-  Hardstanding
-  SPEN Compound
-  Temporary Construction Compound
-  Substation Compound
-  Access Track New
-  Access Track Upgrade
-  Borrow Pit Search Areas


















1:40,000 Scale @ A3
 0 1 2 km
 NORTH

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Ornithological Survey Areas Figure 2, Appendix 8.1

Carrick Windfarm Year 1 Baseline Ornithology Report



-  Site Boundary
-  Site Boundary at time of surveys
-  Wind Turbines
-  Access Track Upgrade
-  Access Track New
-  Cranepad
-  Hardstanding
-  SPEN Compound
-  Temporary Construction Compound
-  Substation Compound
-  Borrow Pit Search Areas
-  Vantage Points
-  VP1 Viewshed
-  VP2 Viewshed
-  VP3 Viewshed
-  VP4 Viewshed
-  VP5 Viewshed

Viewsheds have been calculated assuming a lowest rotor swept height of 30m.

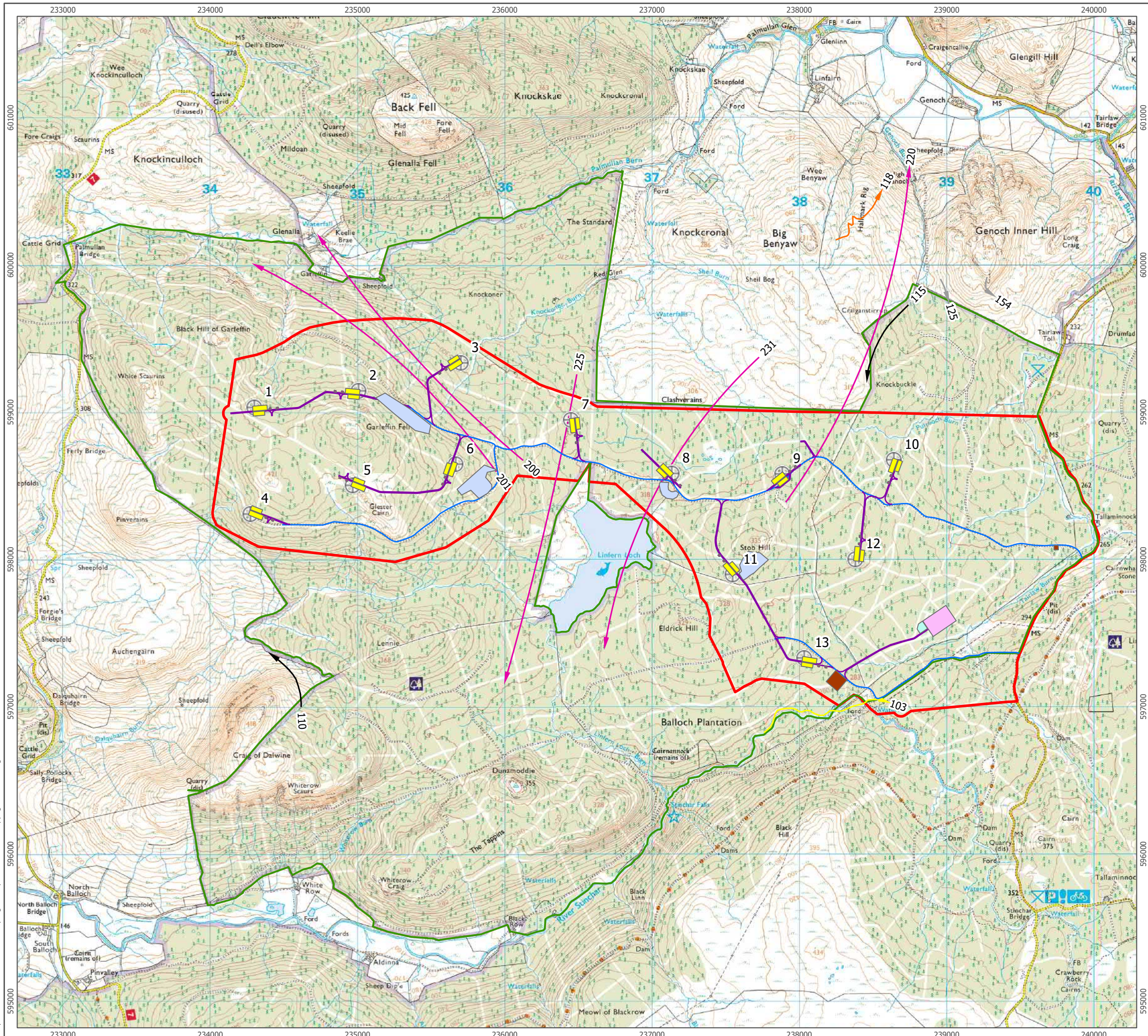


















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Checked By: SC	Date: 14/12/2021

Vantage Point
Locations and Viewsheds
Figure 3, Appendix 8.1

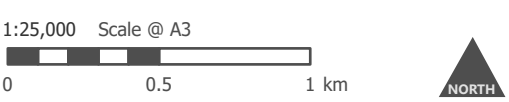
Carrick Windfarm
Year 1 Baseline
Ornithology Report

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-  Site Boundary
-  Site Boundary at time of surveys
-  Wind Turbines
-  Access Track Upgrade
-  Access Track New
-  Substation Compound
-  Temporary Construction Compound
-  SPEN Compound
-  Hardstanding
-  Cranepad
-  Borrow Pit Search Areas
- Flightlines**
 -  Black Grouse
 -  Grey Heron
 -  Pink-footed Goose
 -  Snipe
 -  Woodcock

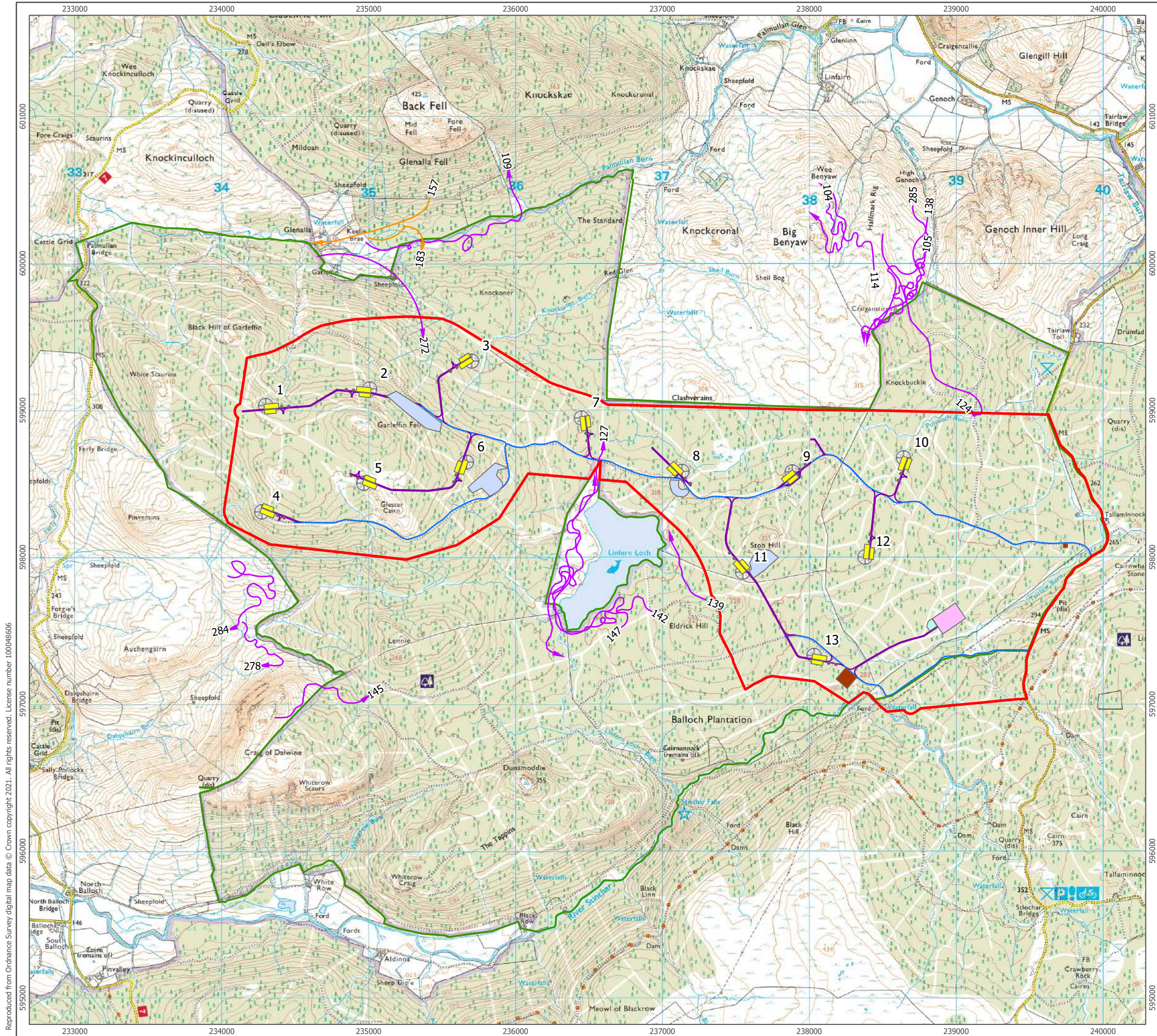
Numbers shown are key numbers, which are unique to each flight and allow identification of individual flights.



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Checked By: SC	Date: 14/12/2021

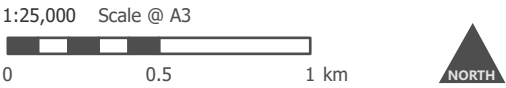
**Target Species Flights -
Waders, Wildfowl and Black Grouse**
Figure 4, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**



- Site Boundary
- Site Boundary at time of surveys
- Wind Turbines
- Access Track Upgrade
- Access Track New
- Substation Compound
- Temporary Construction Compound
- SPEN Compound
- Hardstanding
- Cranepad
- Borrow Pit Search Areas
- Flightlines**
 - Hen Harrier
 - Merlin

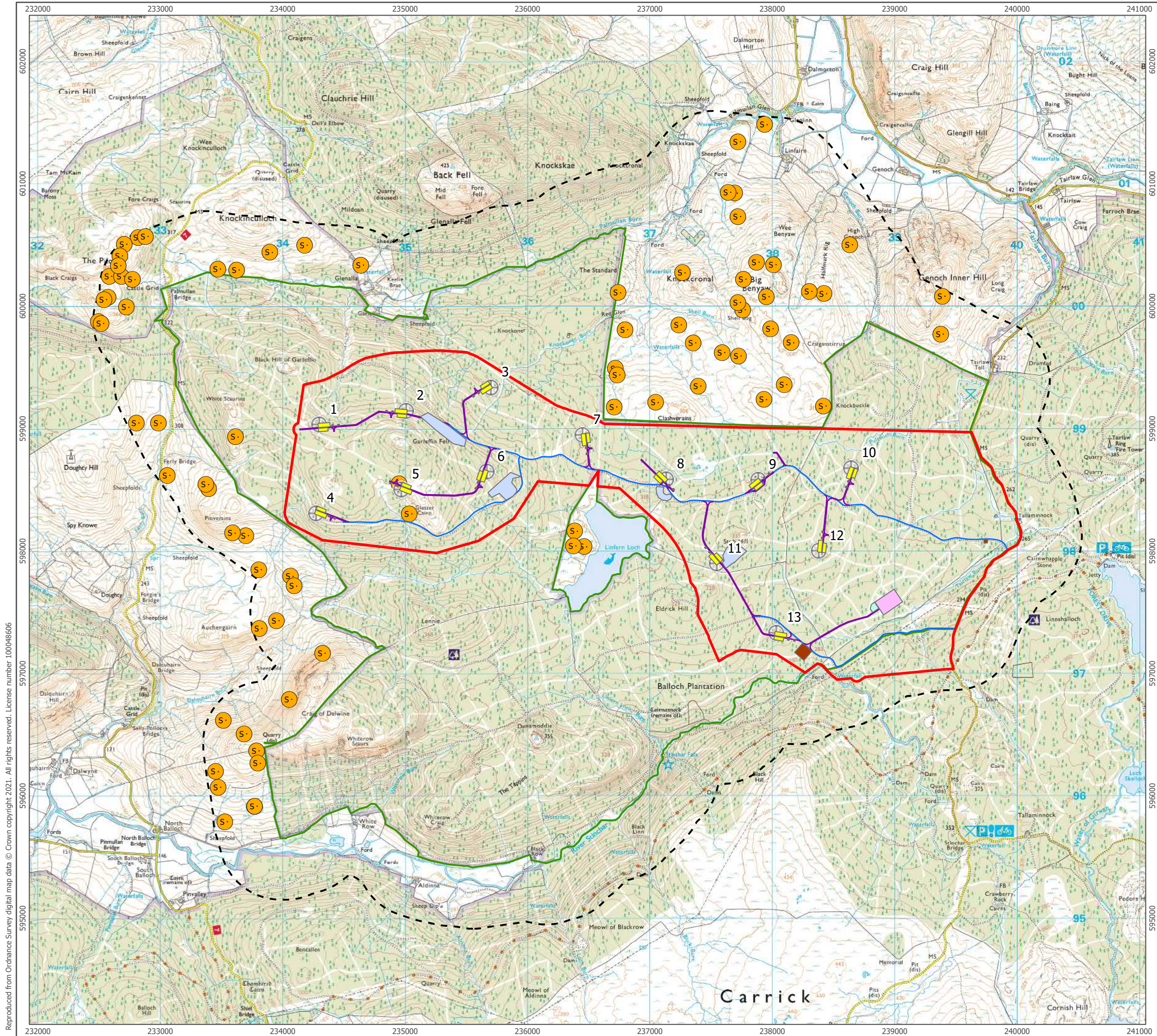
Numbers shown are key numbers, which are unique to each flight and allow identification of individual flights.



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Checked By: SC	Date: 14/12/2021

**Target Species Flights -
Merlin and Hen Harrier**
Figure 5, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**



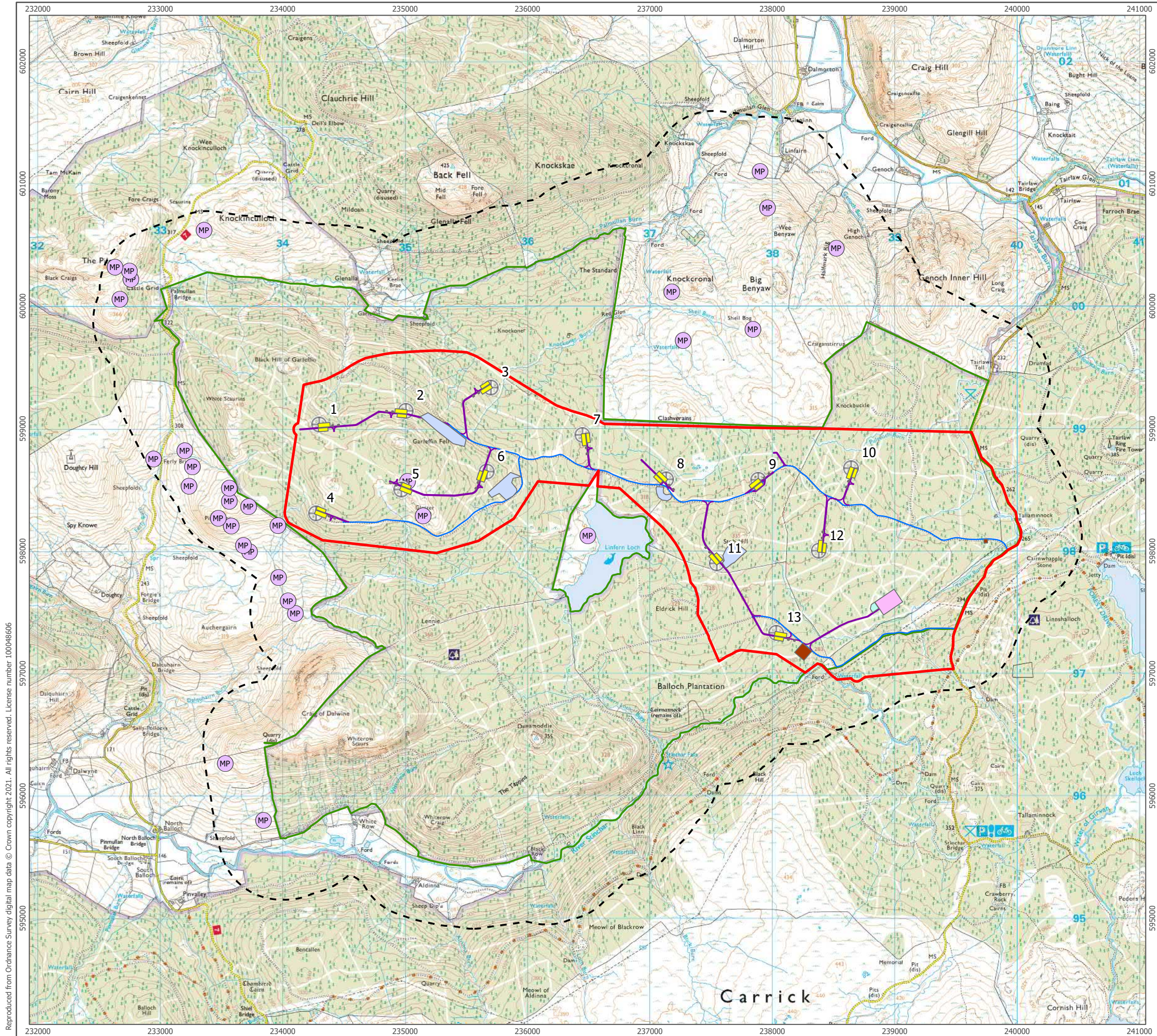
- Site Boundary
- Site Boundary at time of surveys
- 500 m Buffer
- Wind Turbines
- Access Track Upgrade
- Access Track New
- Substation Compound
- Temporary Construction Compound
- SPEN Compound
- Hardstanding
- Cranepad
- Borrow Pit Search Areas
- Breeding Birds
 - Skylark



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Checked By: SC	Date: 14/12/2021

Breeding Bird Territories - Skylark
Figure 6, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**



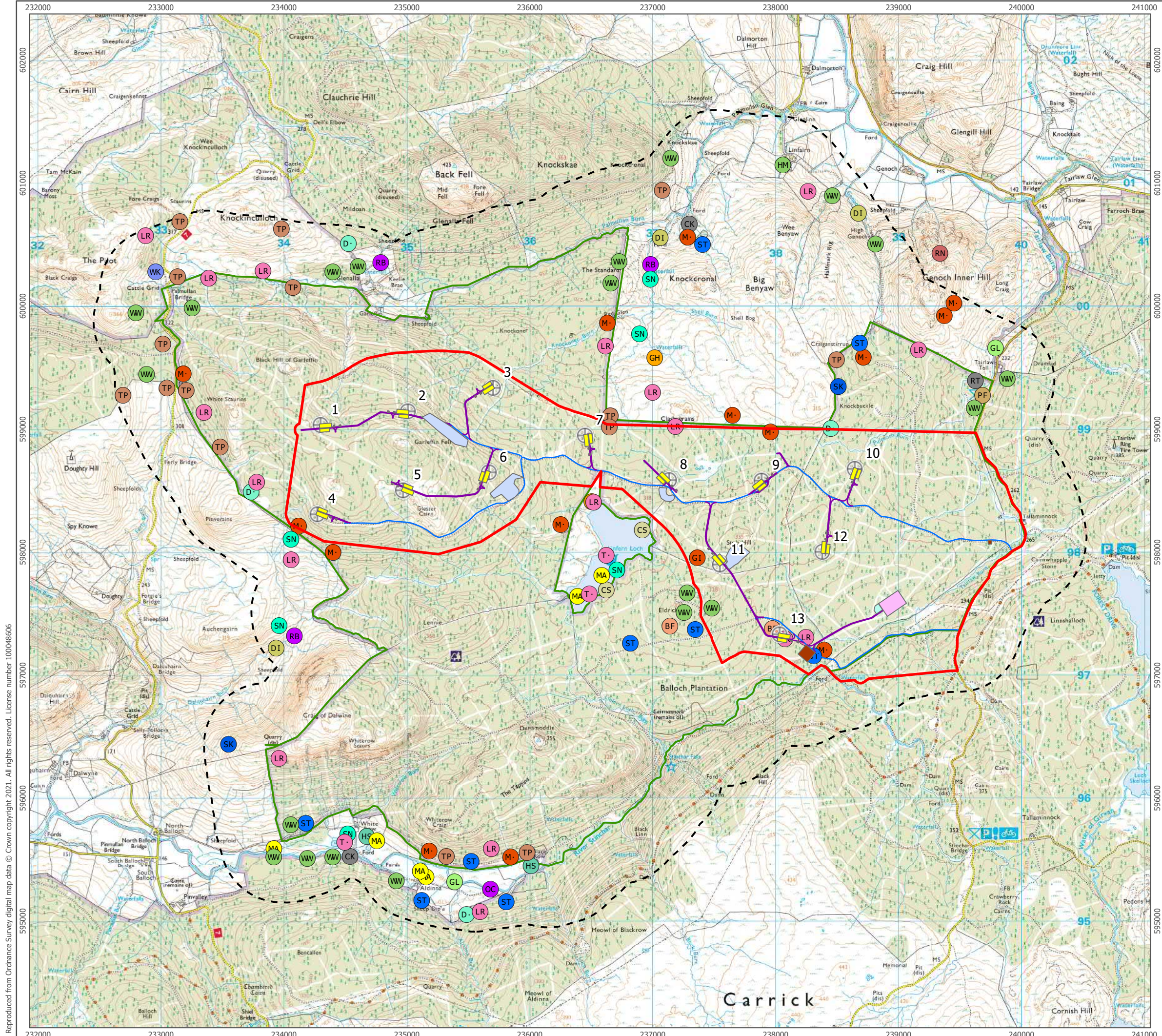
- Site Boundary
- Site Boundary at time of surveys
- 500 m Buffer
- Wind Turbines
- Substation Compound
- Temporary Construction Compound
- SPEN Compound
- Hardstanding
- Cranepad
- Borrow Pit Search Areas
- Access Track New
- Access Track Upgrade
- Breeding Birds
 - Meadow Pipit

1:30,000 Scale @ A3
0 0.5 1 km
NORTH

Produced By: MR	Ref: 3012-REP-007
Checked By: SC	Date: 14/12/2021

**Breeding Bird Territories -
Meadow Pipit**
Figure 7, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**



- Site Boundary
- Site Boundary at time of surveys
- 500 m Buffer
- Wind Turbines
- Access Track Upgrade
- Access Track New
- Substation Compound
- Temporary Construction Compound
- SPEN Compound
- Hardstanding
- Cranepad
- Borrow Pit Search Areas

- Breeding Birds
- | | | | |
|----|---------------------|----|-----------------|
| BF | Bullfinch | OC | Oystercatcher |
| CS | Common Sandpiper | PF | Pied Flycatcher |
| CK | Cuckoo | RN | Raven |
| DI | Dipper | LR | Redpoll |
| D | Dunnock | RT | Redstart |
| GI | Goshawk | RB | Reed Bunting |
| GH | Grasshopper Warbler | SK | Siskin |
| GL | Grey Wagtail | SN | Snipe |
| HM | House Martin | ST | Song Thrush |
| HS | House Sparrow | T | Teal |
| MA | Mallard | TP | Tree Pipit |
| M | Mistle Thrush | WW | Willow Warbler |
| | | WK | Woodcock |



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Checked By: SC	Date: 14/12/2021

Breeding Bird Territories - Wildfowl, Waders and Passerines
Figure 8, Appendix 8.1

**Carrick Windfarm
Year 1 Baseline
Ornithology Report**