

---

**Proposed Ackron Wind Farm**  
on behalf of Airvolution Clean Energy Ltd.  
Breeding Bird Season Survey Report 2018



Document Control				
Project Name:		Proposed Ackron Wind Farm		
Project Number:		Airvol-001-905		
Report Title:		Breeding Bird Season Survey Report 2018		
Issue	Date	Notes	Prepared	Reviewed
v1	09/01/2019	For issue to client	C. Bonnington <i>DPhil MSc BSc MCIEEM</i>	N. Robinson <i>MSc BSc ACIEEM</i>

This report has been prepared in accordance with the terms and conditions of appointment for Habitats and Vegetation Surveys [on request]. Avian Ecology Ltd. (6839201) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

# CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>0</b>
<b>2</b>	<b>METHODOLOGY .....</b>	<b>0</b>
2.2	VP Flight Activity Survey .....	0
2.3	Moorland Breeding Bird Survey .....	2
2.4	Breeding Raptor and Owl Searches.....	2
2.5	Breeding Diver Searches .....	2
2.6	Breeding Diver Focal Loch Watches .....	3
<b>3</b>	<b>RESULTS .....</b>	<b>3</b>
3.1	VP Flight Activity Survey .....	3
3.2	Moorland Breeding Bird Survey .....	5
3.3	Breeding Raptor and Owl Searches.....	6
3.4	Breeding Diver Searches .....	6
3.5	Diver Focal Loch Flight Activity Survey .....	6
<b>4</b>	<b>SUMMARY .....</b>	<b>6</b>

**FIGURE 1: VP LOCATIONS**

**FIGURE 2: LOCH PLAN FOR DIVER SEARCHES**

**FIGURE 3: WADER TERRITORY LOCATIONS**

**FIGURE 4: RAPTOR SEARCH RESULTS**

**FIGURE 5: DIVER FOCAL LOCH WATCHES PLAN**

**FIGURE 6: VP TARGET SPECIES FLIGHT ACTIVITY**

**FIGURE 7: DIVER FLIGHT ACTIVITY AT FOCAL LOCHS**

# 1 INTRODUCTION

- 1.1.1 This Report presents the results of the breeding bird surveys carried out during the 2018 breeding bird season, in relation to the proposed Ackron wind farm, located on land to the south east of Melvich, Sutherland, Scotland.
- 1.1.2 The following surveys have been completed:
- Vantage Point (VP) Flight Activity Surveys;
  - Moorland Breeding Bird Survey (MBBS);
  - Breeding Raptor and Owl Searches;
  - Breeding Diver Searches; and,
  - Breeding Diver Focal Loch Watches.
- 1.1.3 All surveys have been undertaken by suitably competent ornithologists comprising Mr A. Carroll, Mr P. Carroll, Mr A. McNab, Mr A. Little, Mr K. Little and Mr R. Whytock; all of whom have extensive experience in the undertaking of bird surveys for proposed wind farm developments in the Scottish uplands.
- 1.1.4 The report includes confidential records, including nest sites of Schedule 1 birds so the results should not be made accessible to the public.

# 2 METHODOLOGY

- 2.1.1 Survey methodologies have made reference to the following key pieces of guidance;
- Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study* 40, 189-195.
  - Scottish Natural Heritage (SNH) (2017) *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Version 2. March 2017.
  - Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: a field guide to survey and monitoring*. Third Edition. The Stationary Office, Edinburgh.
  - Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird monitoring methods*. A manual of techniques for key UK species. RSPB, Sandy, Bedfordshire.
  - Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove A., Noble, D., Stroud, D. & Gregory, R. (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.

## 2.2 VP Flight Activity Survey

- 2.2.1 VP flight activity surveys were undertaken between February and August 2018, following SNH guidance (2017).

2.2.2 Three VP locations were used to provided maximum coverage of the VP study area as shown in **Figure 1** and detailed within **Table 2.1**.

**Table 2.1: VP locations**

VP	X	Y	Radius (m)
1	NC 90940	61565	2000
2	NC 90792	64279	2000
3	NC 92449	61847	2000

2.2.3 In the absence of known proposed turbine locations, the VP study area has comprised the Site, extended to include all areas within 500m to ensure survey coverage in accordance with SNH guidance (2017).

2.2.4 The total survey effort (hours) completed at each VP location is summarised in **Table 2.2**.

2.2.5 Survey times were dispersed throughout the day and were also completed in a range of weather conditions, but always conducive to survey and safe access.

**Table 2.2: VP flight activity survey effort**

VP	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Total
1	6	18	6	12	15	9	6	<b>72</b>
2	6	18	6	12	9	15	6	<b>72</b>
3	6	0	18	12	9	21	6	<b>72</b>

2.2.6 In accordance with SNH guidance (2017), flight lines were mapped for all target species passing through the VP study area. Details of species, number of birds, flight height in bands, duration and direction were noted on standardised recording forms and field plans.

2.2.7 The following height bands were used in the field:

- Band 1 = <20m
- Band 2 = 20 – 150m
- Band 3 = >150m

2.2.8 Target species comprised all Annex 1 and Schedule 1 listed raptors and owls, all waders, all geese, swans and ducks (excluding mallard *Anas platyrhynchos*) and terns as observed during survey.

2.2.9 Secondary species were also noted in approximately 15 minute summary intervals, with the number of birds present and general behaviour recorded in order to build an overall picture of activity.

- 2.2.10 Secondary species are defined as commoner raptors (buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*), all gulls, feral species, mallard and raven *Corvus corax*, along with any large concentrations of Schedule 1 or Red-listed passerines as recorded during survey.

### **2.3 Moorland Breeding Bird Survey**

- 2.3.1 A moorland breeding bird survey (MBBS) was undertaken following an adapted Brown and Shepherd (1993) methodology, in accordance with SNH guidance (2017) and comprised four staggered visits, at least two weeks apart between April and July 2018.
- 2.3.2 The study area comprised all suitable open moorland habitats within the Site, extended out to 500m as shown in **Figure 3** in accordance with SNH guidance (2017). Given the large extent of the study area, a team of two ornithologists typically completed each survey.
- 2.3.3 During survey all birds were recorded onto a base map, with the type of activity noted (e.g. calling, singing, seen, displaying).
- 2.3.4 All survey visits were undertaken in fine weather conditions conducive to survey and no limitations to the survey were experienced. Survey details are provided in the excel spreadsheet.

### **2.4 Breeding Raptor and Owl Searches**

- 2.4.1 Searches for breeding Schedule 1 and Annex 1 listed raptors and owls were conducted over eleven visits between February and August 2018, adopting species-specific survey advice from Hardey *et al.* (2013), in accordance with SNH guidance (2017).
- 2.4.2 Search areas comprised the site and areas out to 2km for all Schedule 1 and Annex 1 listed species, extended to 6km for eagle species as illustrated in **Figure 4.1**, in accordance with SNH guidance (2017).
- 2.4.3 Searches consisted of a combination of walkover surveys and vantage point watches over suitable habitat features to determine occupancy and/or any breeding/ territorial behaviour.
- 2.4.4 All survey visits were undertaken in fine weather conditions conducive to survey and no limitations to the survey were experienced. Survey details are provided in the excel spreadsheet.

### **2.5 Breeding Diver Searches**

- 2.5.1 Searches for breeding red-throated diver *Gavia stellata* and black-throated diver *Gavia arctica* were completed over eight visits between mid-June and end of July 2018, adopting species-specific survey advice in Gilbert *et al.* (1998), in accordance with SNH guidance (2017).
- 2.5.2 The search area comprised coverage of all lochans within 2km of the Site as shown in **Figure 2**.
- 2.5.3 During searches all observations of divers were marked onto base maps.
- 2.5.4 All survey visits were undertaken in fine weather conditions conducive to survey and no limitations to the survey were experienced. Survey details are provided in the excel spreadsheet.

## 2.6 Breeding Diver Focal Loch Watches

2.6.1 During breeding diver searches, evidence of breeding red-throated divers were recorded [REDACTED].

As per SNH guidance (2017), focal watches of breeding lochans were therefore carried out, to identify flight paths of commuting adult birds.

2.6.2 Twenty-four hours of survey were carried out [REDACTED].

2.6.3 The survey was carried out early to mid-August 2018 during the main chick incubation/rearing period. Surveys were carried out across a range of times, with some surveys carried out at dawn and dusk in order to record early and late flights to and from nest sites.

2.6.4 The methodology followed that summarised above for VP flight activity surveys, with all diver flights recorded onto a base map, and information gathered, including species, number of birds and height band.

2.6.5 All survey visits were undertaken in fine weather conditions conducive to survey and no limitations to the survey were experienced. Survey details are provided in the excel spreadsheet.

## 3 RESULTS

### 3.1 VP Flight Activity Survey

3.1.1 Target species flight activity recorded over the survey period from all VPs combined is summarised in **Table 3.1**.

**Table 3.1: VP summary results**

Species	No. of flights	No. of birds	Duration in flight (secs)	Time spent in height band 1 (secs)	Time spent in height band 2 (secs)	Time spent in height band 3 (secs)
Pink-footed goose <i>Anser brachyrhynchus</i>	10	215	985	0	170	815
Greylag goose <i>Anser anser</i>	29	165	1,757	719	622	416
Shelduck <i>Tadorna tadorna</i>	1	2	46	46	0	0
Teal <i>Anas crecca</i>	1	1	14	14	0	0
Goldeneye <i>Bucephala</i>	1	1	20	20	0	0



<i>clangula</i>						
Red-throated diver <sup>1</sup>	5	8	298	58	225	15
Grey heron <i>Ardea cinerea</i>	5	5	331	166	150	15
White-tailed eagle <i>Haliaeetus albicilla</i>	3	3	360	90	270	0
Hen harrier <i>Circus cyaneus</i>	9	10	868	463	150	255
Golden eagle <i>Aquila chrysaetos</i>	1	1	90	0	0	90
Osprey <i>Pandion haliaetus</i>	3	3	345	0	195	150
Oystercatcher <i>Haematopus ostralegus</i>	2	3	45	0	45	0
Golden plover <i>Pluvialis apricaria</i>	1	23	60	15	45	0
Lapwing <i>Vanellus vanellus</i>	13	45	523	373	135	15
Curlew <i>Numenius arquata</i>	16	17	550	280	195	75
Common sandpiper <i>Actitis hypoleucos</i>	1	2	65	65	0	0
Greenshank <i>Tringa nebularia</i>	1	1	56	56	0	0
Snipe <i>Gallinago gallinago</i>	6	6	220	55	75	90
Great skua <i>Stercorarius skua</i>	1	1	30	0	30	0
Arctic tern <sup>2</sup> <i>Sterna</i>	75	117	4,590	1,515	1,920	1,155

---

<sup>1</sup> [REDACTED]

<i>paradisaea</i>						
Merlin <i>Falco columbarius</i>	6	9	220	55	165	0
Peregrine <i>Falco peregrinus</i>	6	8	1,639	94	265	1,280

3.1.2 **Figure 6.1-6.7** shows the flight activity of target species during the survey.

## 3.2 Moorland Breeding Bird Survey

3.2.1 **Table 3.2** presents the number of breeding territories of waders recorded during the surveys. **Figure 3** shows the approximate locations of the wader territories within the study area.

3.2.2 A colony of Arctic tern (approximately 6 pairs) were present [REDACTED] in May.

3.2.3 Other breeding species of interest recorded during the MBBS were the Schedule 1 crossbill *Loxia curvirostra* (3-6 suspected territories) and a grey heron nesting site (4 nests) near Ackron Farm (NC 9009 6254). The breeding bird assemblage recorded is characteristic of an upland site. The full results of the MBBS can be found in the excel spreadsheet.

3.2.4 A single greenshank was recorded [REDACTED] (both in flight, and heard singing nearby) on 30<sup>th</sup> April and 1<sup>st</sup> May however, no further breeding evidence or presence was recorded over the remaining survey period and as such was not considered to have bred within the study area during the 2018 breeding season.

**Table 3.2. Wader breeding territories.**

Species	No. of Territories
Oystercatcher	1
Lapwing	3
Curlew	6
Snipe	6

---

<sup>2</sup> [REDACTED]

### 3.3 Breeding Raptor and Owl Searches

- 3.3.1 Observations of the following key species were made within the study area during the searches: merlin, peregrine, hen harrier, golden eagle and white-tailed eagle.
- 3.3.2 To summarise, only immature white-tailed eagle were recorded, a pair of breeding peregrine were suspected although the nest site was not located, so considered to be breeding outside the study area, and although a food pass between a male and female hen harrier was noted ( ), targeted survey effort recorded no evidence of breeding hen harrier, and thus hen harrier is not considered to have breed within the study area.
- 3.3.3 Only breeding evidence for merlin was obtained and confirmed in the study area during the searches. This comprised a single successful nest site ( ).
- 3.3.4 **Figure 4.1-4.2** shows the approximate location of the merlin nest site, and **Figure 4.1** shows the the Annex 1 and Schedule 1 raptor flights recorded during the searches.
- 3.3.5 Observations of all other raptors comprised either non-breeding birds or were considered to be associated with likely breeding territories located outside the study area.

### 3.4 Breeding Diver Searches

- 3.4.1 Searches identified the presence of two adult pairs of red-throated divers ( ).
- 3.4.2 Only advanced breeding evidence was confirmed for one adult pair ( ), where two chicks were recorded. The other pair are assumed to have failed (with no chicks recorded), but remained local during the 2018 breeding season.

### 3.5 Diver Focal Loch Flight Activity Survey

- 3.5.1 Fifty-seven red-throated diver flights were recorded during survey. ( )  
( )  
No regular flight activity occurred over the Site.
- 3.5.2 A single black-throated diver flight was also recorded. There was no evidence that this species bred within close proximity of the Site in 2018 (within 2km).
- 3.5.3 **Figure 7** shows the diver flight activity during the survey.

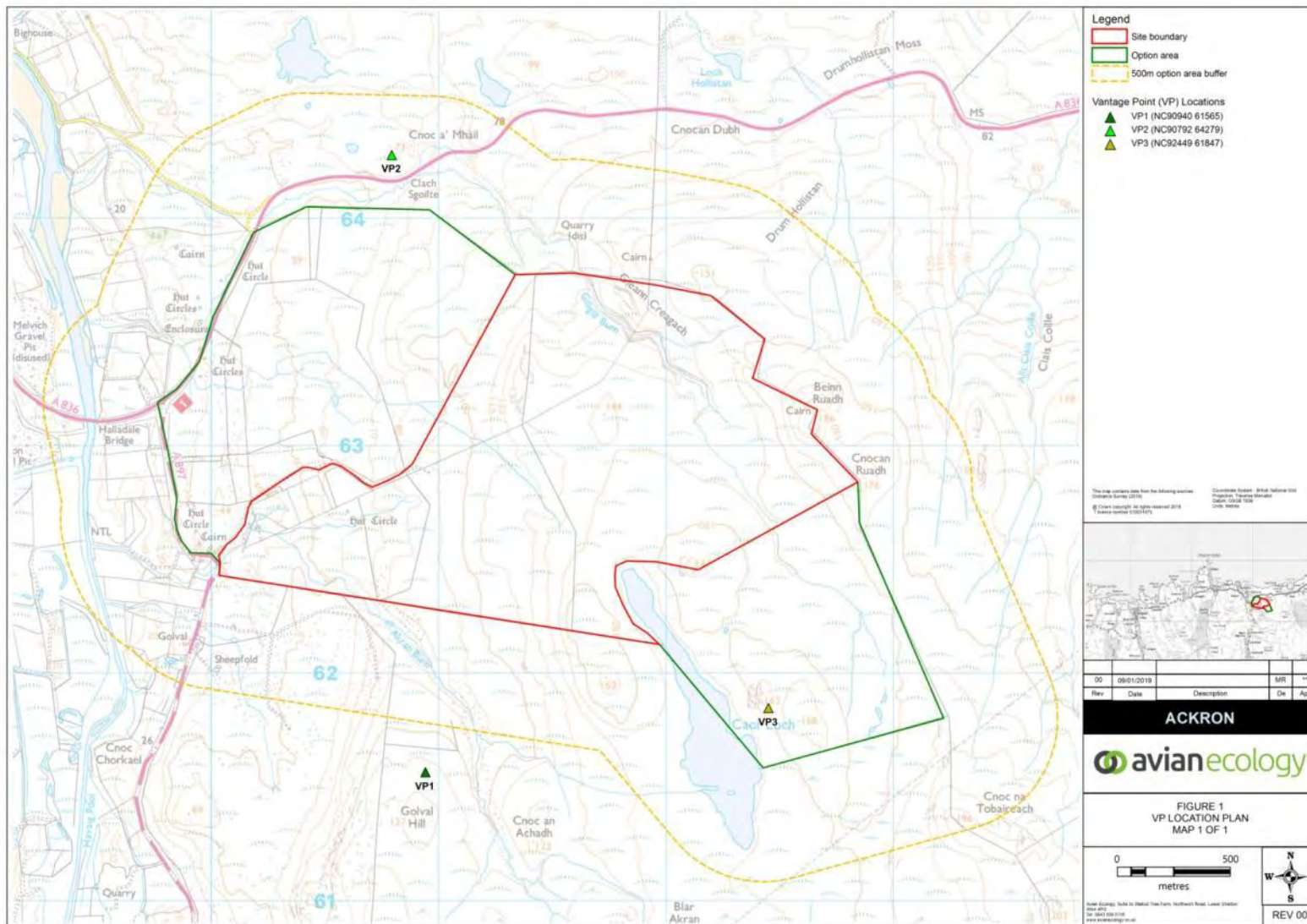
## 4 SUMMARY

- 4.1.1 **Table 4.1** below presents a summary of the main findings of the breeding bird season surveys carried out in 2018.

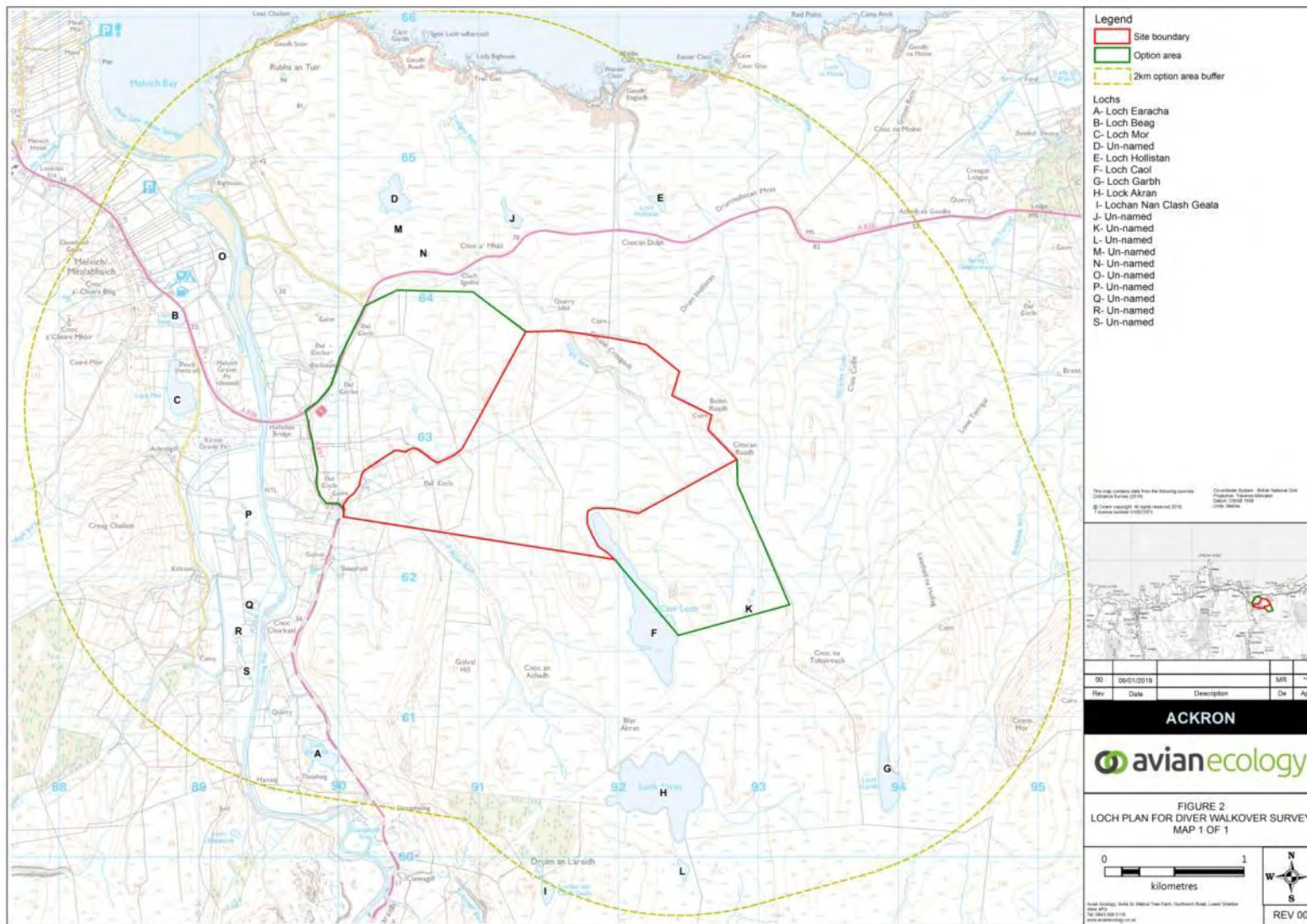
**Table 4.1: Breeding bird season 2018 survey summary.**

Survey type	Main findings
VP Flight Activity	Flights of 22 target species recorded, with arctic tern (75 flights) and greylag goose (29 flights) the most regularly occurring species. In terms of the most number of birds passing of any one species, this was pink-footed goose with 215 bird passes.
MBBS	Four wader species breeding in study area, consisting of six curlew, six snipe, three lapwing and an oystercatcher territory. Small arctic tern colony (c.6 pairs) present [REDACTED]. Evidence that greenshank territory was establishing in study area, but did not successfully breed. Breeding bird assemblage characteristic of an upland site.
Breeding Raptors and Owls	Single successful merlin nest site in study area.
Breeding Diver Searches	Two lochans [REDACTED] supported breeding red-throated diver (one pair was successful, the other pair believed to have failed).
Breeding Diver Focal Loch Watches	Fifty-seven red-throated diver flights, [REDACTED] with no regular activity over the Site itself.

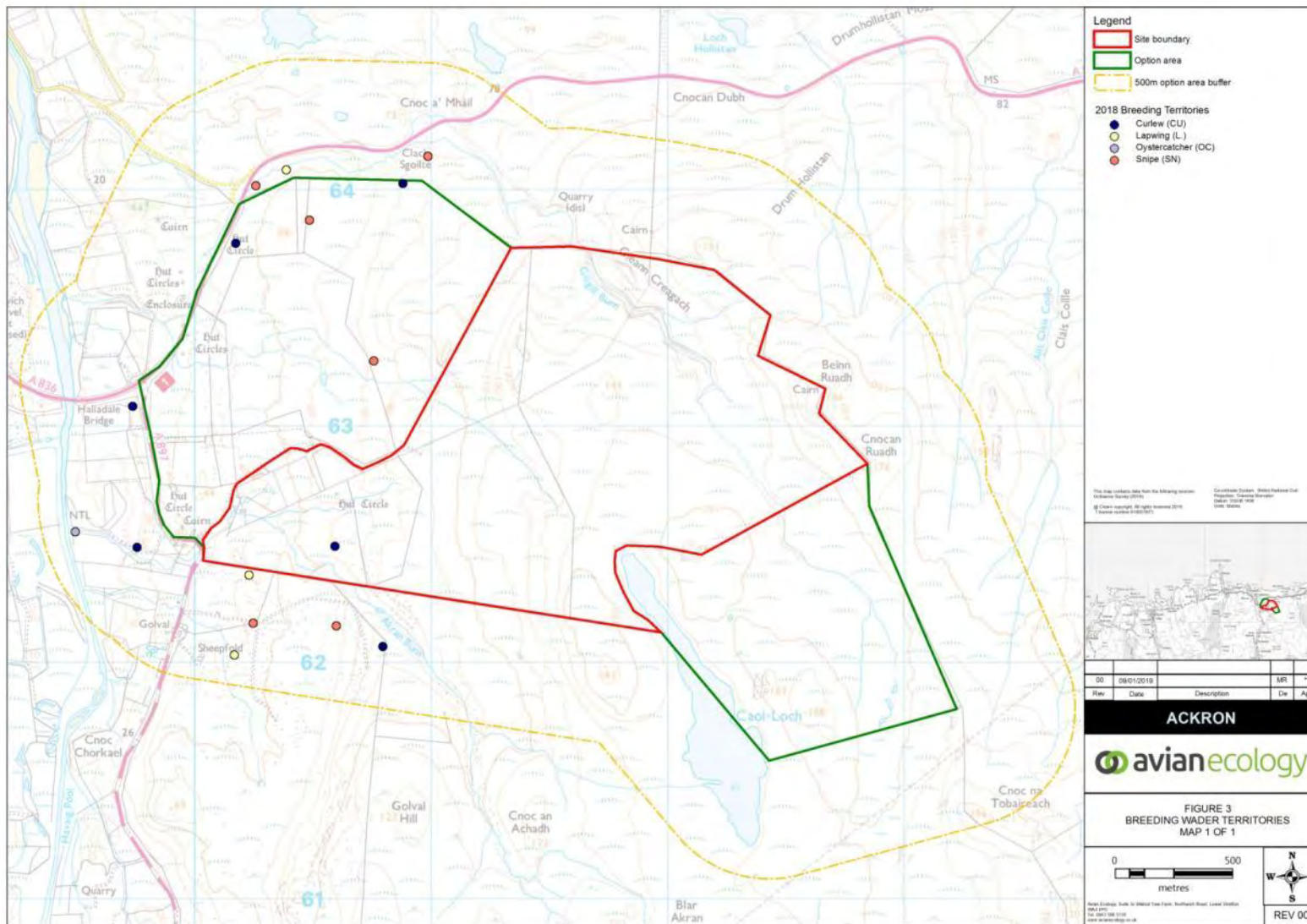
**FIGURE 1: VP LOCATIONS**



**FIGURE 2: LOCH PLAN FOR DIVER SEARCHES**



**FIGURE 3: WADER TERRITORY LOCATIONS**



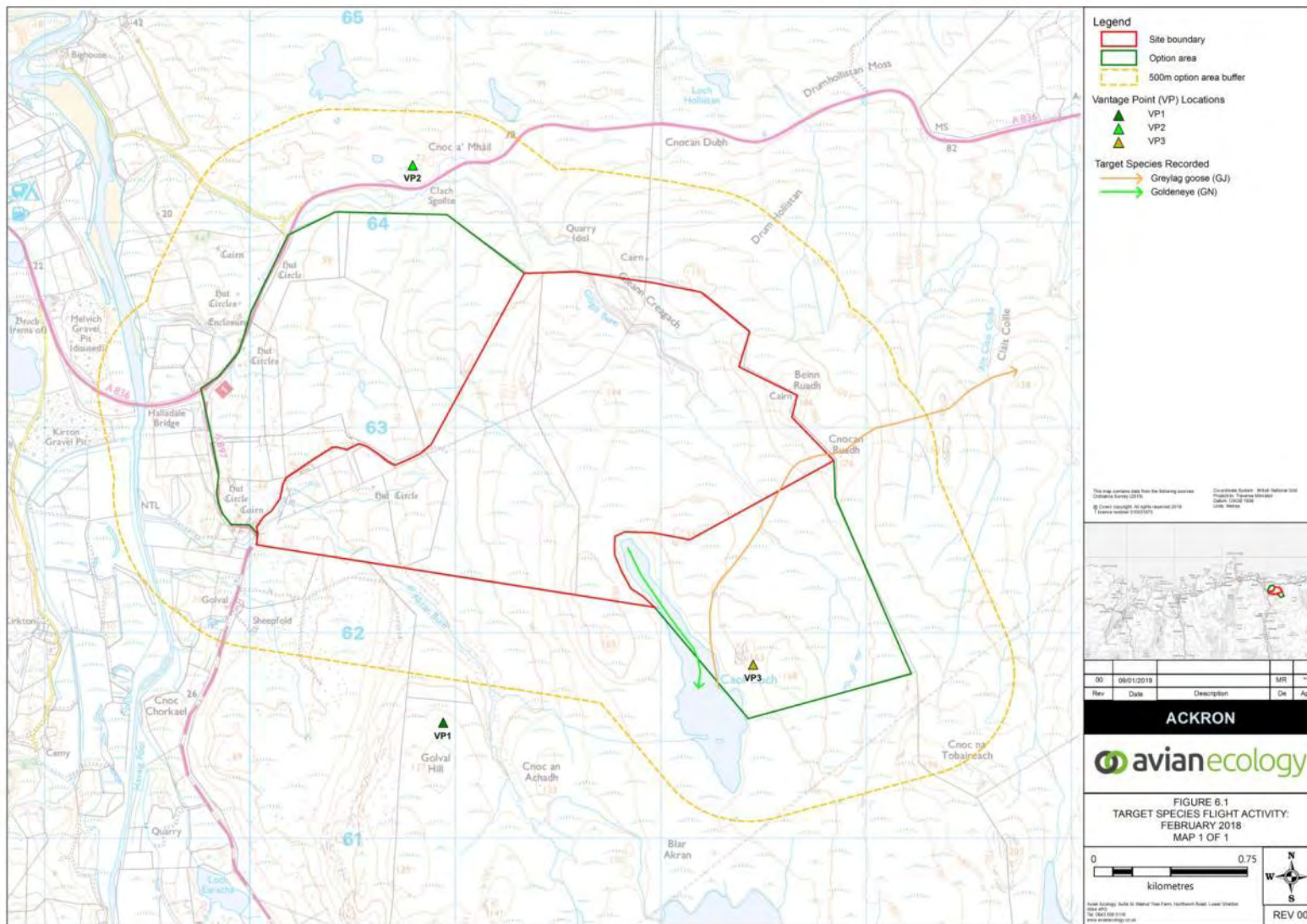




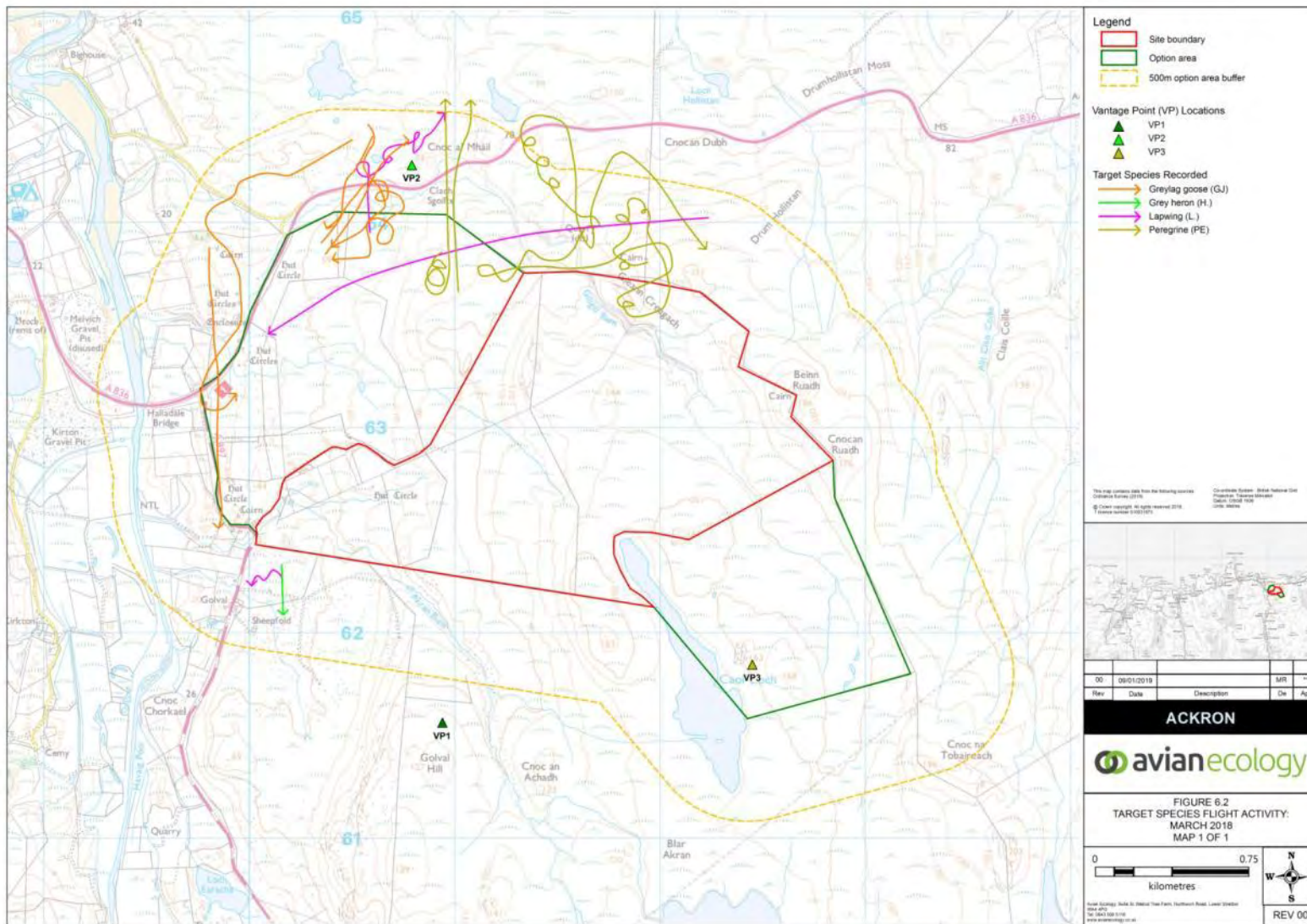




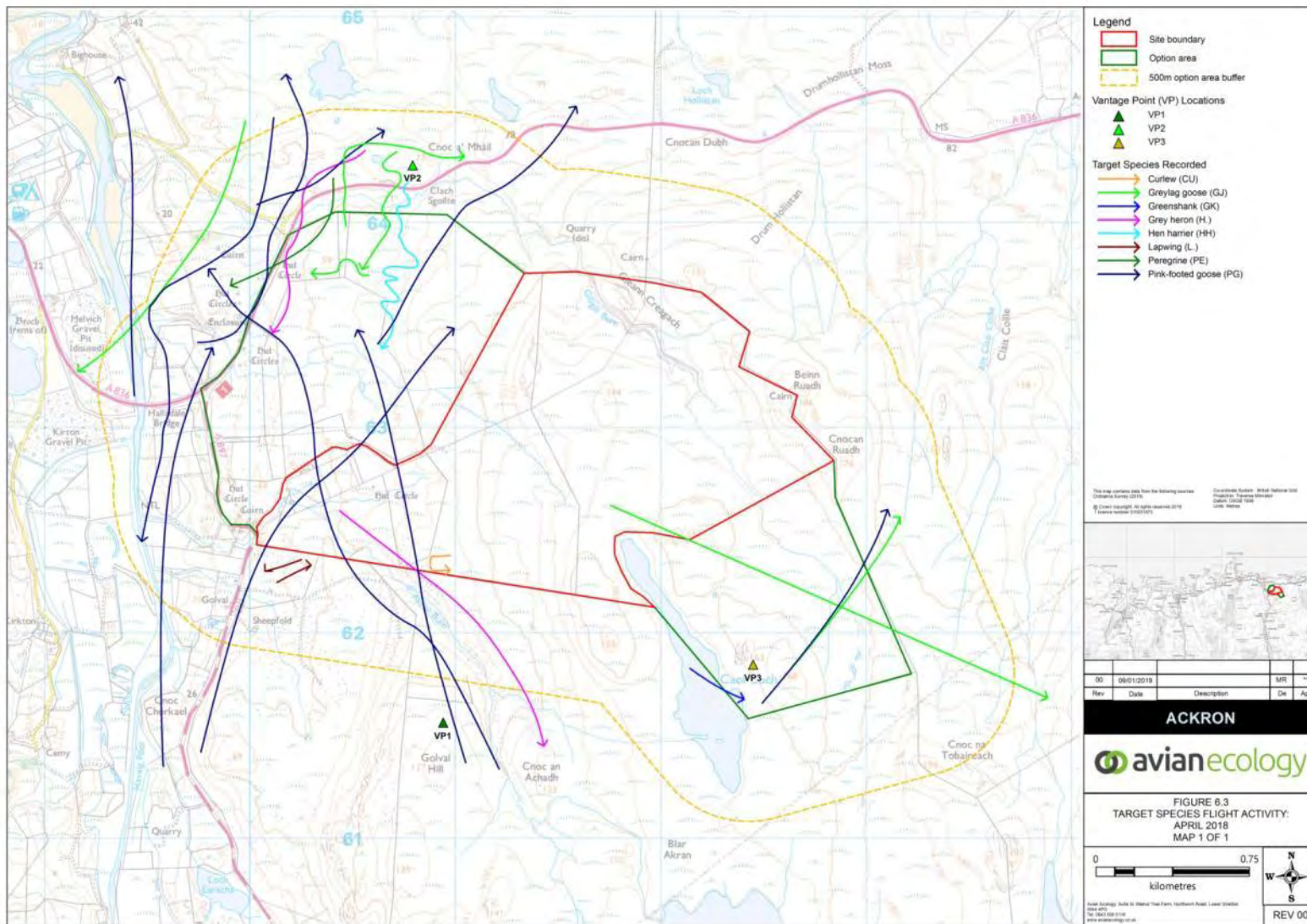
**FIGURE 6.1: VP TARGET SPECIES FLIGHT ACTIVITY – FEBRUARY 2018**



**FIGURE 6.2: VP TARGET SPECIES FLIGHT ACTIVITY – MARCH 2018**



**FIGURE 6.3: VP TARGET SPECIES FLIGHT ACTIVITY – APRIL 2018**



**FIGURE 6.4: VP TARGET SPECIES FLIGHT ACTIVITY – MAY 2018**

