

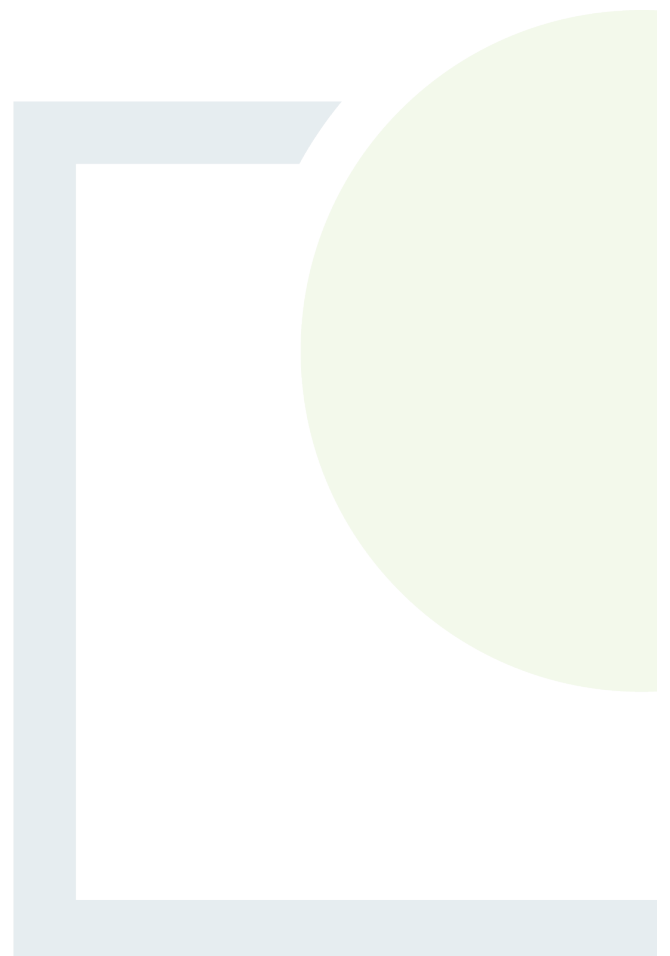


**FEHILY
TIMONEY**

**CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING**

Appendix 8.A

Biodiversity Terrestrial
Ecology Appendices



Appendix 8A

Biodiversity Terrestrial Ecology Appendices

Ballinagree Wind Farm



January 2022

List of Appendices

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Appendix 8A.1
Terrestrial Biodiversity Survey Schedules & Statement of
Competence

Avifauna Vantage Point (VP) and Hinterland Survey Schedules (March 2017 – March 2020)

VP Survey Schedule Ballinagree, Breeding Season Survey 2017.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
30.03.17	1	10.00 - 13.30	3hrs 30 mins	Dry initially then Mist/Rain; F3-4; Good to Poor Visibility;8/8 Okta
30.03.17	2	11.30 - 12.45	1hr 15mins	Dry initially then Mist/Rain; F3-4; Good to Poor (from 12.15hrs) Visibility;8/8 Okta
30.03.17	3	n/a	0hrs 0mins	Mist/Rain; F4; Moderate to Poor Visibility;8/8 Okta
30.03.17	4	10.45 - 13.30	2hrs 45mins	Dry initially then Mist/Rain; F3-4; Good to Poor (from 12.55hrs) Visibility;8/8 Okta
30.03.17	5	11.05 - 13.30	2 hrs 25mins	Dry; F3; Good Visibility;8/8 Okta
30.03.17	6	11.20 - 12.00 & 12.50 - 13.25	1hr 15mins	Dry initially then Mist/Rain; F1; Moderate to Poor Visibility;8/8 Okta
20.04.17	1	09.30 - 16.15	6hrs 45mins	Dry; F0-3; Good Visibility; 0-7/8 Okta
20.04.17	2	09.35 - 16.20	6hrs 45 mins	Dry; F0-1; Good Visibility; 3-7/8 Okta
21.04.17	3	09.45 - 16.30	6hrs 45mins	Dry; F1-2; Good Visibility; 1-8/8 Okta
21.04.17	4	09.45 - 16.50	7hrs 5mins	Dry; F1-3; Good Visibility; 1-6/8 Okta
21.04.17	5	09.45 - 16.50	7hrs 5mins	Dry; F2; Good Visibility; 2/8 Okta
21.04.17	6	10.00 - 16.55	6hrs 45mins	Dry; F1; Good Visibility; 4/8 Okta
26.04.17	2	10.00-11.00	1hr 0mins	Dry; F3-4; Good Visibility; 6-7/8 Okta
26.04.17	3	11.20-13.35	2hrs 15mins	Dry; F3-4; Good Visibility; 6-7/8 Okta
26.04.17	6	15.30-16.30	1hr 0mins	Dry; F3-4; Good Visibility; 7/8 Okta
12.05.17	1	09.25 - 15.50	6hrs 25mins	Dry; F3; Moderate - Good Visibility; 7/8 Okta
12.05.17	2	09.35 - 16.20	6hrs 45mins	Dry; F2-4; Moderate - Good Visibility; 8/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
12.05.17	3	09.45 - 16.30	6hrs 45mins	Dry; F3-4; Good Visibility; 7/8 Okta
12.05.17	4	09.45 - 16.15	6hrs 30mins	Dry; F3-4; Moderate - Good Visibility; 6-8/8 Okta
12.05.17	5	10.05 - 16.40	6hrs 35mins	Dry; F4; Good Visibility; 8/8 Okta
12.05.17	6	09.40 - 15.40 & 16.00 - 16.45	6hrs 45mins	Dry; F2-3; Moderate - Good Visibility; 8/8 Okta
15.06.17	1	09.40 - 14.05	6hrs 25mins	Light rain; F2-3; Good Visibility; 7/8 Okta
16.06.17	2	10.00 - 16.45	6hrs 45mins	Dry; F3; Good Visibility; 2-7/8 Okta
15.06.17	3	09.50 - 16.35	6hrs 45mins	Dry; F5; Good Visibility; 7/8 Okta
15.06.17	4	09.45 - 16.15	6hrs 30mins	Dry with occ. showers; F4; Good Visibility; 8/8 Okta
16.06.17	5	10.40 - 17.15	6hrs 35mins	Dry; F2-4; Good Visibility; 7-8/8 Okta
16.06.17	6	10.05 - 16.50	6hrs 45mins	Dry; F2-3; Good Visibility; 3/8 Okta
13.07.17	1	10.30 - 16.55	6hrs 25 mins	Dry; F0-1; Good Visibility; 6/8 Okta
12.07.17	2	09.25 - 16.10	6hrs 45mins	Dry; F0-3; Good Visibility; 0-6/8 Okta
13.07.17	3	10.45 - 17.30	6hrs 45mins	Dry; F1-3; Good Visibility; 8/8 Okta
13.07.17	4	11.00 - 17.30	6hrs 30mins	Dry; Good Visibility; 6/8 Okta
12.07.17	5	09.55 - 16.30	6hrs 35mins	Dry; Good Visibility; 2-3/8 Okta
12.07.17	6	09.30 - 16.15	6hrs 45mins	Dry; F1; Good Visibility; 1-2/8 Okta
23.08.17	1	09.40 - 16.10	6hrs 30 mins	Occ. light mist); F1-2; Good Visibility; 6-8/8 Okta
23.08.17	2	09.40 - 16.25	6hrs 45mins	Occ. Rain; F3; Good Visibility; 8/8 Okta
24.08.17	3	11.05 - 17.50	6hrs 45mins	Occ. Light Mist; F2-4; Moderate - Good Visibility; 4-8/8 Okta
23.08.17	4	09.45 - 16.20	6hrs 35mins	Occ. Light Mist; Good Visibility; 4-8/8 Okta
23.08.17	5	09.50 - 16.30	6hrs 40mins	Occ. Showers; F3; Good Visibility; 6-8/8 Okta
23.08.17	6	09.45 - 16.30	6hrs 45mins	Occ. Showers; F1-2; Good Visibility; 7-8/8 Okta

Hinterland Survey Schedule Ballinagree, Breeding Season Survey 2017

Date	Time (24hrs)	Survey Effort (hrs & mins)	Weather
15.04.17	10.00 - 16.10	6 hrs 10 mins	Dry (one shower); F2-4; Good Visibility; 6-8/8 Okta
26.04.17	15.00-15.15	0hrs 15mins	Dry; F3-4; Good Visibility; 8/8 Okta
13.07.17	10.20 - 17.20	7 hrs	Dry; F3; Good Visibility; 4-7/8 Okta

VP Survey Schedule Ballinagree, Winter Season Survey 2017/2018.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
24.10.17	1	09.55 - 15.55	6 hrs	Dry initially, showers from 13.00, light rain for last 45 mins; F1-2; Good to Moderate Visibility (last 45 mins);8/8 Okta
24.10.17	2	09.50 - 15.50	6 hrs	Showers; F3-4; Good to Moderate Visibility; 8/8 Okta
24.10.17	3	10.03 - 16.03	6 hrs	Showers; F3; Good to Moderate Visibility; 8/8 Okta
24.10.17	4	09.50 - 15.50	6 hrs	Occ. Drizzle; F2-3; Good Visibility; 8/8 Okta
24.10.17	5	09.58 - 15.58	6 hrs	Dry; F2-3; Good to Moderate Visibility; 8/8 Okta
24.10.17	6	10.00 - 16.00	6 hrs	Occ. Showers, light rain after 14.00; F3; Good to Moderate Visibility; 8/8 Okta
09.11.17	1	08.10 - 14.10	6 hrs	Dry; F3; Good Visibility; 3-6/8 Okta
09.11.17	2	09.15 - 15.15	6 hrs	Occ. Light mist; F5; Good Visibility; 8/8 Okta
09.11.17	3	09.15 - 15.15	6 hrs	Dry; F2-4; Good Visibility; 2-7/8
09.11.17	4	09.10 - 15.10	6 hrs	Dry; F4-5; Good Visibility; 2-8/8

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
09.11.17	5	09.40 - 15.40	6 hrs	Occ. Showers; F3-4; Good Visibility; 2-7/8
09.11.17	6	09.50 - 15.50	6 hrs	Dry; F3-4; Good Visibility; 6-8/8
05.12.17	1	11.01 - 16.31	5.5 hrs	Occ. Drizzle; F3-4; Good - Moderate Visibility; 8/8 Okta
05.12.17	2	11.00 - 16.30	5.5 hrs	Dry but low cloud last 30 mins; F4; Good - Poor Visibility (last 30 mins); 8/8 Okta
05.12.17	3	11.00 - 16.30	5.5 hrs	Mist after 12.15; F3-5; Good - Poor Visibility; 8/8 Okta
05.12.17	4	11.00 - 16.30	5.5 hrs	Occ drizzle & low cloud; F3; Moderate to Poor Visibility; 8/8 Okta
05.12.17	5	10.50 - 16.35	5 hrs 45 mins	Occ. Showers & low cloud; F1-2; Good - Poor Visibility; 8/8 Okta
05.12.17	6	10.55 - 16.30	5 hrs 35 mins	Dry; F1; Good- Moderate Visibility; 8/8 Okta
25.01.18	1	11.30 - 17.30	6 hrs	Occ. Showers; F2-4; Good Visibility; 6-7/8
25.01.18	2	11.40 - 17.40	6 hrs	Occ. Showers; F4-5; Good - Moderate Visibility; 8/8
26.01.18	3	11.40 - 17.40	6 hrs	Light rain in last hour; F1-2; Good - Moderate Visibility (last 20 mins); 8/8
25.01.18	4	11.30 - 17.30	6 hrs	Occ. Showers; F3-4; Good - Moderate Visibility; 7/8
25.01.18	5	11.15 - 17.15	6 hrs	Occ. Showers; F2; Good Visibility; 7/8 Okta
26.01.18	6	11.30 - 17.30	6 hrs	Light rain last 1.5hrs; F1; Good Visibility; 7/8
21.02.18	1	10.17 - 16.17	6 hrs	Dry; F1; Good Visibility; 4-8/8 Okta
21.02.18	2	09.38 - 15.38	6 hrs	Dry; F2; Good Visibility; 1-7/8 Okta
21.02.18	3	10.15 - 16.15	6 hrs	Dry; F1; Good Visibility; 1-8/8 Okta
21.02.18	4	09.30 - 15.30	6 hrs	Dry; F1; Good Visibility; 2/8 Okta
26.02.18	5	09.45 - 15.45	6 hrs	Dry; F3-4; Good Visibility; 8/8 Okta
26.02.18	6	09.45 - 15.45	6 hrs	One light snow shower; F3; Good Visibility; 4-8/8 Okta
16.03.18	1	09.30 - 15.30	6 hrs	Occ. Showers; F2-3; Good Visibility; 8/8
16.03.18	2	09.30 - 15.30	6 hrs	Occ. showers; F2-3; Good to Moderate Visibility; 7/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
16.03.18	3	09.50 - 15.50	6 hrs	Occ. showers; F1-2; Good to Moderate Visibility; 7-8/8 Okta
16.03.18	4	09.50 - 15.50	6 hrs	Occ. showers; F3-4; Good Visibility; 8/8 Okta
21.03.18	5	10.05 - 16.05	6 hrs	Dry; F2-3; Good Visibility; 1-8/8 Okta
22.03.18	6	10.00 - 16.00	6 hrs	Dry; F1-2; Good Visibility; 4/8 Okta

VP Survey Schedule Ballinagree, Breeding Season Survey 2018.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
16.03.18	1	09.30 - 15.30	6 hrs	Occ. Showers; F2-3; Good Visibility; 8/8
16.03.18	2	09.30 - 15.30	6 hrs	Occ. showers; F2-3; Good to Moderate Visibility; 7/8 Okta
16.03.18	3	09.50 - 15.50	6 hrs	Occ. showers; F1-2; Good to Moderate Visibility; 7-8/8 Okta
16.03.18	4	09.50 - 15.50	6 hrs	Occ. showers; F3-4; Good Visibility; 8/8 Okta
21.03.18	5	10.05 - 16.05	6 hrs	Dry; F2-3; Good Visibility; 1-8/8 Okta
22.03.18	6	10.00 - 16.00	6 hrs	Dry; F1-2; Good Visibility; 4/8 Okta
11.04.18	1	09.00 - 15.00	6 hrs	Dry; F0; Moderate Visibility; 8/8 Okta
19.04.18	2	08.30 - 14.30	6 hrs	Dry; F2-3; Moderate - Good Visibility; 3-8/8 Okta
11.04.18	3	09.30 - 15.30	6 hrs	Dry; F1; Moderate - Good Visibility; 8/8 Okta
11.04.18	4	09.53 - 15.53	6 hrs	Dry; F2-3; Moderate Visibility; 8/8 Okta
19.04.18	5	09.45 - 15.45	6 hrs	Dry; F2-3; Moderate - Good Visibility; 3/8 Okta
19.04.18	6	09.35 - 15.35	6 hrs	Occ. Drizzle; F1-2; Moderate - Good Visibility; 4-8/8
10.05.18	1	09.55 - 15.55	6 hrs	Dry; F3; Good Visibility; 5/8 Okta
10.05.18	2	09.48 - 15.48	6 hrs	Dry; F3-5; Good Visibility; 5/8 Okta
25.05.18	3	09.20 - 15.20	6 hrs	Dry; F3; Good Visibility; 1-5/8 Okta
10.05.18	4	10.12 - 16.12	6 hrs	Dry; F2; Good Visibility; 6/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
25.05.18	5	09.45 - 15.45	6 hrs	Dry; F3-4; Good Visibility; 1-4/8 Okta
25.05.18	6	09.30 - 15.30	6 hrs	Dry; F3; Good Visibility; 3/8 Okta
08.06.18	1	09.35 - 15.35	6 hrs	Dry; F1-2; Good Visibility; 5/8 Okta
11.06.18	2	09.00 - 15.00	6 hrs	Dry; F3; Good Visibility; 7/8 Okta
08.06.18	3	09.20 - 15.20	6 hrs	Dry; F3; Good Visibility; 7/8 Okta
08.06.18	4	09.15 - 15.15	6 hrs	Dry; F2-3; Good Visibility; 3/8 Okta
11.06.18	5	09.10 - 15.10	6 hrs	Dry; F3; Good Visibility; 7-8/8 Okta
11.06.18	6	09.30 - 15.30	6 hrs	Dry; F3-4; Moderate - Good Visibility; 4-6/8 Okta
06.07.18	1	09.12 - 15.12	6 hrs	Dry; F2; Good Visibility; 4-8/8 Okta
06.07.18	2	09.21 - 15.21	6 hrs	Occ. Showers; F3; Good Visibility; 3-8/8 Okta
06.07.18	3	09.24 - 15.24	6 hrs	Dry; F2; Good Visibility; 5/8 Okta
06.07.18	4	09.05 - 15.05	6 hrs	Dry; F2-3; Good Visibility; 4-7/8 Okta
06.07.18	5	09.30 - 15.30	6 hrs	Occ. Mist; F0-1; Good Visibility; 4-8/8 Okta
06.07.18	6	09.10 - 15.10	6 hrs	Occ. Mist; F1; Good Visibility; 4-8/8 Okta
22.08.18	1	09.25 - 15.25	6 hrs	Light mist initially; F2-4; Moderate - Good Visibility; 5-8/8 Okta
22.08.18	2	09.15 - 15.15	6 hrs	Light mist initially; F3; Moderate - Good Visibility; 5-8/8 Okta
22.08.18	3	09.30 - 15.30	6 hrs	Light mist initially; F4; Moderate - Good Visibility; 5-8/8 Okta
22.08.18	4	09.15 - 15.15	6 hrs	Light mist initially; F3-4; Moderate - Good Visibility; 5-8/8 Okta
22.08.18	5	09.30 - 15.30	6 hrs	Light mist initially; F4; Moderate - Good Visibility; 6-8/8 Okta
22.08.18	6	09.20 - 15.20	6 hrs	Light mist initially; F2-4; Moderate - Good Visibility; 4-8/8 Okta

Hinterland Survey Schedule Ballinagree, Breeding Season 2018.

Date	Time (24hrs)	Survey Effort (hrs & mins)	Weather
11.04.18	09.48 - 16.00	6 hrs 12 mins	Dry; F1; Good Visibility; 8/8 Okta
18.04.18	08.00 - 12.20	4hrs 20 mins	Occ. Showers; F5; Poor - Good Visibility; 8/8 Okta
20.07.19	09.27 - 17.59	8 hrs 30 mins	Dry; F2-3; Good Visibility; 5/8 Okta

VP Survey Schedule Ballinagree, Winter Season Survey 2018/2019.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
17.10.18	1	08.11 - 14.55	6 hrs	Dry; F1-2; Good Visibility; 3/8 Okta
17.10.18	2	09.24 - 15.24	6 hrs	Dry; F4; Good Visibility; 2/8 Okta
17.10.18	3	09.20 - 15.20	6 hrs	Dry; F2-3; Good Visibility; 1-6/8 Okta
17.10.18	4	09.30 - 15.30	6 hrs	Dry; F5-6; Good Visibility; 1-6/8 Okta
17.10.18	5	09.30 - 15.30	6 hrs	Dry; F4-5; Good Visibility; 3/8 Okta
17.10.18	6	08.55 - 14.55	6 hrs	Dry; F3; Good Visibility; 2/8 Okta
16.11.18	1	09.15 - 15.15	6 hrs	Occasional drizzle; F5; Moderate to Poor Visibility; 8/8 Okta
22.11.18	2	09.00 - 15.00	6 hrs	Showers for last hour; F4; Good Visibility; 7/8 Okta
16.11.18	3	09.00 - 15.00	6 hrs	Mist; F4; Poor Visibility; 8/8 Okta
16.11.18	4	09.00 - 15.00	6 hrs	Mist; F3; Moderate to Poor Visibility; 8/8 Okta
22.11.18	5	09.00 - 15.00	6 hrs	Showers for last hour; F3-4; Good Visibility; 7-8/8 Okta
22.11.18	6	09.00 - 15.00	6 hrs	Showers for last hour; F3; Good Visibility; 5/8 Okta
07.12.18	1	09.02 - 15.02	6 hrs	Showers ; F4-5; Good Visibility; 5/8 Okta
10.12.18	2	08.30 - 14.30	6 hrs	Occ. Light rain; F2; Good Visibility; 8/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
07.12.18	3	09.15 - 15.15	6 hrs	Occ. Showers; F4-6; Good Visibility; 1-7/8 Okta
07.12.18	4	09.18 - 15.18	6 hrs	Occ. Showers; F4-6; Good Visibility; 1-7/8 Okta
10.12.18	5	08.48 - 14.48	6 hrs	Occ. Drizzle; F1-2; Moderate to Poor; 8/8 Okta
07.12.18	6	09.40 - 15.40	6 hrs	Showers; F4-5; Good Visibility; 3-8/8 Okta
11.01.19	1	09.00 - 15.00	6 hrs	Occ. Mist; F1-2; Good to Moderate Visibility; 7-8/8 Okta
11.01.19	2	09.00 - 15.00	6 hrs	Occ. Mist; F1-2; Good to Moderate Visibility; 7-8/8 Okta
11.01.19	3	08.55 - 14.55	6 hrs	Occ. Mist; F1; Good Visibility; 4/8 Okta
11.01.19	4	09.00 - 15.00	6 hrs	Dry; F3; Good Visibility; 5/8 Okta
11.01.19	5	08.55 - 14.55	6 hrs	Dry; F2; Good to Moderate Visibility; 4-7/8 Okta
11.01.19	6	08.50 - 15.50	6 hrs	Occ. Light drizzle; F1; Good Visibility; 4/8 Okta
15.02.19	1	09.00 - 15.00	6 hrs	Drizzle after 13.00; F3; Good to Moderate Visibility; 8/8 Okta
15.02.19	2	09.00 - 15.00	6 hrs	Drizzle after 12.50; F5; Good to Moderate Visibility; 8/8 Okta
15.02.19	3	09.00 - 15.00	6 hrs	Drizzle after 12.50; F5; Good to Moderate Visibility; 8/8 Okta
15.02.19	4	09.00 - 15.00	6 hrs	Drizzle after 13.00; F3-4; Moderate - Poor Visibility; 8/8 Okta
15.02.19	5	09.25 - 15.25	6 hrs	Drizzle after 12.50; F3-4; Moderate - Poor Visibility; 8/8 Okta
15.02.19	6	08.40 - 14.40	6 hrs	Drizzle after 12.50; F1-3; Moderate - Poor Visibility; 8/8 Okta
28.03.19	1	09.40 - 15.40	6 hrs	Dry; F1-3; Good Visibility; 1/8 Okta
29.03.19	2 (new)	09.15 - 15.15	6 hrs	Dry; F1-3; Good Visibility; 4-8/8 Okta
28.03.19	3	10.15 - 16.15	6 hrs	Dry; F2-3; Good Visibility; 6/8 Okta
28.03.19	4	09.10 - 15.10	6 hrs	Dry; Good Visibility; 3/8 Okta
29.03.19	5	09.35 - 15.35	6 hrs	Dry; F3; Good Visibility; 8/8 Okta
28.03.19	6	09.45 - 15.45	6 hrs	Dry; F2; Good Visibility; 1/8 Okta

VP Survey Schedule Ballinagree, Breeding Season Survey 2019.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
28.03.19	1	09.40 - 15.40	6 hrs	Dry; F1-3; Good Visibility; 1/8 Okta
29.03.19	2 (new)	09.15 - 15.15	6 hrs	Dry; F1-3; Good Visibility; 4-8/8 Okta
28.03.19	3	10.15 - 16.15	6 hrs	Dry; F2-3; Good Visibility; 6/8 Okta
28.03.19	4	09.10 - 15.10	6 hrs	Dry; Good Visibility; 3/8 Okta
29.03.19	5	09.35 - 15.35	6 hrs	Dry; F3; Good Visibility; 8/8 Okta
28.03.19	6	09.45 - 15.45	6 hrs	Dry; F2; Good Visibility; 1/8 Okta
29.03.19	7	09.04 - 15.04	6 hrs	Dry; F2-3; Moderate to Good Visibility; 7-8/8 Okta
29.03.19	8	09.14 - 15.14	6 hrs	Dry; F3-4; Good Visibility; 2-8/8 Okta
17.04.19	1	09.00 - 15.00	6 hrs	Drizzle Initially; F4-5; Moderate to Good Visibility; 8/8 Okta
17.04.19	2 (new)	09.03 - 15.03	6 hrs	Mist Initially; F4; Moderate to Good Visibility; 8/8 Okta
17.04.19	3	10.16 - 16.16	6 hrs	Fog Initially; F3; Poor to Good Visibility; 8/8 Okta
17.04.19	4	09.20 - 15.20	6 hrs	Low Cloud Initially; F4; Poor to Good Visibility; 8/8 Okta
17.04.19	5	09.25 - 15.25	6 hrs	Low Cloud Initially; F3; Poor to Good Visibility; 8/8 Okta
17.04.19	6	08.57 - 14.58	6 hrs	Low Cloud Initially; F3; Poor to Good Visibility; 8/8 Okta
17.04.19	7	09.20 - 15.20	6 hrs	Low Cloud Initially; F5; Poor to Good Visibility; 7-8/8 Okta
17.04.19	8	09.00 - 15.00	6 hrs	Fog Initially; F3; Poor to Good Visibility; 8/8 Okta
13.05.19	1	09.05 - 15.05	6 hrs	Dry; F4-5; Moderate to Good Visibility; 3/8 Okta
13.05.19	2 (new)	09.25 - 15.25	6 hrs	Dry; F4; Good Visibility; 2-3/8 Okta
13.05.19	3	09.05 - 15.05	6 hrs	Dry; F4; Good Visibility; 3/8 Okta
13.05.19	4	09.25 - 15.25	6 hrs	Dry; F3-4; Good Visibility; 2-3/8 Okta
13.05.19	5	09.02 - 15.02	6 hrs	Dry; F4-5; Good Visibility; 3/8 Okta
13.05.19	6	09.50 - 15.50	6 hrs	Dry; F0-1; Good Visibility; 2/8 Okta
13.05.19	7	09.01 - 15.01	6 hrs	Dry; F6; Good Visibility; 1/8 Okta
13.05.19	8	08.59 - 14.59	6 hrs	Dry; F4; Good Visibility; 1/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
12.06.19	1	09.50 - 15.50	6 hrs	Showers; F2-3; Good Visibility; 8/8 Okta
12.06.19	2 (new)	09.30 - 15.30	6 hrs	Showers; F4; Good Visibility; 8/8 Okta
12.06.19	3	09.45 - 15.45	6 hrs	Showers; F3; Good Visibility; 7/8 Okta
12.06.19	4	10.00 - 16.00	6 hrs	Showers; F4; Good Visibility; 8/8 Okta
12.06.19	5	09.15 - 15.15	6 hrs	Showers; F3-4; Moderate Visibility; 8/8 Okta
12.06.19	6	09.26 - 11.50, 12.05 - 15.41	6 hrs	Showers; F3-4; Moderate Visibility; 8/8 Okta
12.06.19	7	09.05 - 15.05	6 hrs	Showers; F4-5; Moderate to Good Visibility; 8/8 Okta
12.06.19	8	09.40 - 15.40	6 hrs	Showers; F4; Moderate to Good Visibility; 8/8 Okta
23.07.19	1	09.00 - 15.00	6 hrs	Occ. Mist; F3-4; Poor to Good Visibility; 8/8 Okta
30.07.19	2 (new)	08.55 - 14.55	6 hrs	Occ. Mist; F4; Poor to Good Visibility; 6-8/8 Okta
23.07.19	3	09.15 - 15.15	6 hrs	Low Cloud; F4; Poor to Moderate Visibility; 8/8 Okta
23.07.19	4	09.00 - 15.00	6 hrs	Low Cloud; F4; Poor to Moderate Visibility; 8/8 Okta
30.07.19	5	09.00 - 15.00	6 hrs	Dry; F5-6; Good Visibility; 7/8 Okta
30.07.19	6	09.15 - 15.15	6 hrs	Dry; F3-4; Good Visibility; 5-8/8 Okta
23.07.19	7	09.01 - 15.01	6 hrs	Occ. Mist; F4-6; Poor to Moderate Visibility; 8/8 Okta
30.07.19	8	09.17 - 15.17	6 hrs	Occ. Mist; F3-4; Moderate to Good Visibility; 6-8/8 Okta
31.07.19	9	10.00 - 16.00	6 hrs	Mist Initially; F1-3; Moderate to Good Visibility; 5-8/8 Okta
31.07.19	10	10.00 - 16.00	6 hrs	Mist Initially; F1-3; Poor to Good Visibility; 8/8 Okta
21.08.19	1	07.49 - 13.49	6 hrs	Light rain initially; F4-6; Good Visibility; 8/8 Okta
21.08.19	2 (new)	07.12 - 13.12	6 hrs	Low Cloud initially; F3-6; Good Visibility; 8/8 Okta
21.08.19	3	07.32 - 13.32	6 hrs	Low Cloud initially; F6; Good Visibility; 8/8 Okta
21.08.19	4	07.55 - 13.55	6 hrs	Dry; F4; Good Visibility; 8/8 Okta
21.08.19	5	07.20 - 13.20	6 hrs	Dry; F3-4; Good Visibility; 8/8 Okta
21.08.19	6	07.20 - 13.20	6 hrs	Dry; F3-5; Moderate to Good Visibility; 8/8 Okta
21.08.19	7	07.45 - 13.45	6 hrs	Dry; F4-5; Moderate to Good Visibility; 8/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
21.08.19	8	07.40 - 13.40	6 hrs	Dry; F4-6; Moderate to Good Visibility; 8/8 Okta
21.08.19	9	07.15 - 13.15	6 hrs	Dry; F4; Poor to Good Visibility; 8/8 Okta
21.08.19	10	07.52 - 13.52	6 hrs	Dry; F3-4; Good Visibility; 8/8 Okta

Hinterland Survey Schedule Ballinagree, Breeding Season 2019.

Date	Time (24hrs)	Survey Effort (hrs & mins)	Weather
09.04.19	13.00 - 17.00	4hrs	Dry; F2; Good Visibility; Cloud 6/8
11.04.19	14.00 - 17.45	3 hrs 45 mins	Dry; F3; Good Visibility; Cloud 5/8
27.04.19	14.00 - 17.25	3 hrs 25 mins	Dry; F2; Good Visibility; Cloud 4/8
15.07.19	08.30 - 17.00	8 hrs 30 mins	Dry; F3; Good Visibility; Cloud 7/8
23.07.19	09.15 - 17.15	8 hrs	Occ. Showers; F3; Good Visibility; Cloud 4/8
30.07.19	14.00 - 16.50	2 hrs 50 mins	Dry; F3-4; Good Visibility; Cloud 8/8

VP Survey Schedule Ballinagree, Winter Season Survey 2019/2020.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
11.10.19	1	09.33 - 15.33	6 hrs	Dry; F1-3; Good Visibility; 5-8/8 Okta
11.10.19	2 (new)	09.10 - 15.10	6 hrs	Dry; F3; Good Visibility; 5-8/8 Okta
11.10.19	3	09.30 - 15.30	6 hrs	Dry; F4; Good Visibility; 7/8 Okta
11.10.19	4	09.25 - 15.25	6 hrs	Dry; F4; Good Visibility; 4-8/8 Okta
22.10.19	5	09.30 - 15.30	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
22.10.19	6	09.04 - 15.04	6 hrs	Dry; F1; Good Visibility; 8/8 Okta
11.10.19	7	09.30 - 15.30	6 hrs	Dry; F3; Good Visibility; 6/8 Okta
22.10.19	8	09.59 - 15.59	6 hrs	Occ. Showers; F3-4; Good Visibility; 8/8 Okta
22.10.19	9	09.45 - 15.45	6 hrs	Occ. Drizzle; F2-3; Good Visibility; 8/8 Okta
22.10.19	10	09.15 - 15.15	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
19.11.19	1	09.30 - 15.30	6 hrs	Dry; F3; Good Visibility; 1-7/8 Okta
19.11.19	2 (new)	09.34 - 15.34	6 hrs	Dry; F3-4; Good Visibility; 0-6/8 Okta
19.11.19	3	09.14 - 15.14	6 hrs	Dry; F3-4; Good Visibility; 1-6/8 Okta
19.11.19	4	09.30 - 15.30	6 hrs	Dry; F2-3; Good Visibility; 2-7/8 Okta
22.11.19	5	09.15 - 15.15	6 hrs	Dry; F3; Good Visibility; 8/8 Okta
22.11.19	6	09.35 - 15.35	6 hrs	Dry; F3; Good Visibility; 7-8/8 Okta
19.11.19	7	09.06 - 15.06	6 hrs	Dry; F2; Good Visibility; 2/8 Okta
22.11.19	8	09.00 - 15.00	6 hrs	Dry; F4; Poor to Moderate Visibility; 8/8 Okta
22.11.19	9	09.23 - 15.23	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
22.11.19	10	08.55 - 14.55	6 hrs	Dry; F2-3; Poor to Moderate Visibility; 8/8 Okta
17.12.19	1	09.00 - 15.00	6 hrs	Dry; F1; Good Visibility; 2/8 Okta
17.12.19	2 (new)	09.20 - 15.20	6 hrs	Dry; F1-2; Good Visibility; 2-5/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
17.12.19	3	10.05 - 16.05	6 hrs	Dry; F1-2; Good Visibility; 3/8 Okta
17.12.19	4	09.03 - 15.03	6 hrs	Dry; F2; Good Visibility; 2/8 Okta
16.12.19	5	09.25 - 15.25	6 hrs	Dry; F2; Good Visibility; 0/8 Okta
16.12.19	6	09.11 - 15.11	6 hrs	Dry; F1; Good Visibility; 1/8 Okta
17.12.19	7	09.40 - 15.40	6 hrs	Dry; F2-3; Good Visibility; 3-5/8 Okta
16.12.19	8	09.00 - 15.00	6 hrs	Dry; F2; Good Visibility; 3-5/8 Okta
16.12.19	9	09.59 - 15.59	6 hrs	Dry; F2-3; Good Visibility; 1/8 Okta
16.12.19	10	09.55 - 15.55	6 hrs	Dry; F2; Good Visibility; 1/8 Okta
21.01.20	1	09.30 - 15.30	6 hrs	Dry; F1-4; Good Visibility; 8/8 Okta
20.01.20	2 (new)	10.06 - 16.06	6 hrs	Dry; F1-4; Fair to Good Visibility; 1-3/8 Okta
21.01.20	3	09.50 - 15.50	6 hrs	Dry; F1; Good Visibility; 8/8 Okta
21.01.20	4	08.50 - 14.50	6 hrs	Dry; F1; Good Visibility; 7/8 Okta
20.01.20	5	10.10 - 16.10	6 hrs	Dry; F1-2; Good Visibility; 1-2/8 Okta
20.01.20	6	09.50 - 15.50	6 hrs	Dry; F1; Good Visibility; 1-3/8 Okta
21.01.20	7	09.26 - 15.26	6 hrs	Dry; F2; Good Visibility; 8/8 Okta
20.01.20	8	10.15 - 16.15	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
20.01.20	9	09.30 - 15.30	6 hrs	Dry; F1-3; Good Visibility; 0-3/8 Okta
20.01.20	10	09.30 - 15.30	6 hrs	Dry; F3-4; Good Visibility; 1-3/8 Okta
20.02.20	1	09.00 - 15.00	6 hrs	Dry; F2-3; Fair to Good Visibility; 2-8/8 Okta
20.02.20	2 (new)	09.00 - 15.00	6 hrs	Occ. Snow showers; F4-5; Moderate to Good Visibility; 2-8/8 Okta
20.02.20	3	09.10 - 15.10	6 hrs	Occ. Snow/sleet showers; F3-4; Good Visibility; 4-6/8 Okta
20.02.20	4	09.00 - 15.00	6 hrs	Occ. showers; F3-5; Good Visibility; 6-8/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
27.02.20	5	08.58 - 14.58	6 hrs	Dry; F2-4; Good Visibility; 3/8 Okta
27.02.20	6	09.35 - 14.35	6 hrs	Dry; F2; Good Visibility; 4/8 Okta
20.02.20	7	09.00 - 15.00	6 hrs	Occ. Snow showers; F2; Fair to Good Visibility; 2-8/8 Okta
24.02.20	8	09.05 - 15.05	6 hrs	Dry; F3-4; Good Visibility; 2/8 Okta
27.02.20	9	09.30 - 15.30	6 hrs	Dry; F3; Good Visibility; 1-5/8 Okta
27.02.20	10	09.22 - 15.22	6 hrs	Dry; F1; Good Visibility; 1/8 Okta
18.03.20	1	09.05 - 15.05	6 hrs	Dry; F1; Good Visibility; 8/8 Okta
18.03.20	2 (new)	09.10 - 15.10	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
18.03.20	3	09.36 - 15.36	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
18.03.20	4	08.38 - 14.38	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
20.03.20	5	08.50 - 14.50	6 hrs	Dry; F5; Good Visibility; 0-8/8 Okta
20.03.20	6	08.48 - 14.48	6 hrs	Dry; F2-3; Good Visibility; 1-8/8 Okta
18.03.20	7	09.03 - 15.03	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
20.03.20	8	08.55 - 14.55	6 hrs	Dry; F4-5; Good Visibility; 1-8/8 Okta
20.03.20	9	09.10 - 15.10	6 hrs	Dry; F4; Good Visibility; 1-8/8 Okta
20.03.20	10	08.48 - 14.48	6 hrs	Dry; F3; Good Visibility; 0-8/8 Okta

VP Survey Schedule Ballinagree, Breeding Season Survey 2020.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
18.03.20	1	09.05 - 15.05	6 hrs	Dry; F1; Good Visibility; 8/8 Okta
18.03.20	2 (new)	09.10 - 15.10	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
18.03.20	3	09.36 - 15.36	6 hrs	Dry; F1-2; Good Visibility; 8/8 Okta
18.03.20	4	08.38 - 14.38	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
20.03.20	5	08.50 - 14.50	6 hrs	Dry; F5; Good Visibility; 0-8/8 Okta
20.03.20	6	08.48 - 14.48	6 hrs	Dry; F2-3; Good Visibility; 1-8/8 Okta
18.03.20	7	09.03 - 15.03	6 hrs	Dry; F2-3; Good Visibility; 8/8 Okta
20.03.20	8	08.55 - 14.55	6 hrs	Dry; F4-5; Good Visibility; 1-8/8 Okta
20.03.20	9	09.10 - 15.10	6 hrs	Dry; F4; Good Visibility; 1-8/8 Okta
20.03.20	10	08.48 - 14.48	6 hrs	Dry; F3; Good Visibility; 0-8/8 Okta
24.04.20	1	08.20 - 14.20	6 hrs	Dry; F1; Good Visibility; 6/8 Okta
24.04.20	2 (new)	08.56 - 14.56	6 hrs	Dry, F1-2, Good Visibility, 1-5/8 Okta
24.04.20	3	10.00 - 16.00	6 hrs	Dry, F1, Good Visibility, 6/8 Okta
24.04.20	4	08.45 - 14.45	6 hrs	Dry, F1, Good Visibility, 7/8 Okta
27.04.20	5	09.04 - 15.04	6 hrs	Dry, F1-2, Good Visibility, 6/8 Okta
27.04.20	6	08.30 - 14.30	6 hrs	Dry, F2, Good Visibility, 4-8/8 Okta
24.04.20	7	08.50 - 14.50	6 hrs	Dry, F0-1, Good Visibility, 8/8 Okta
27.04.20	8	08.25 - 14.25	6 hrs	Dry, F2-3, Good Visibility, 2-7/8 Okta
24.04.20	9	08.30 - 14.30	6 hrs	Dry, F1-2, Good Visibility, 4-8/8 Okta
24.04.20	10	08.42 - 14.42	6 hrs	Dry, F1-2, Good Visibility, 2-7/8 Okta
11.05.20	1	09.01 - 15.01	6 hrs	Dry, F4, Good Visibility, 3/8 Okta
11.05.20	2 (new)	08.40 - 14.40	6 hrs	Dry, F3-4, Good Visibility, 2/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
11.05.20	3	08.30 - 14.30	6 hrs	Dry, F4, Good Visibility, 0/8 Okta
11.05.20	4	08.20 - 14.20	6 hrs	Dry, F4, Good Visibility, 1/8 Okta
11.05.20	5	09.04 - 15.04	6 hrs	Dry, F2, Good Visibility, 3-4/8 Okta
11.05.20	6	09.10 - 15.10	6 hrs	Dry, F3-4, Good Visibility, 4/8 Okta
11.05.20	7	08.50 - 14.50	6 hrs	Dry, F4-5, Good Visibility, 3/8 Okta
11.05.20	8	09.03 - 15.03	6 hrs	Dry, F2-3, Good Visibility, 3-4/8 Okta
11.05.20	9	08.35 - 14.35	6 hrs	Dry, F2, Good Visibility, 1/8 Okta
11.05.20	10	09.05 - 15.05	6 hrs	Dry, F2-3, Good Visibility, 3/8 Okta
10.06.20	1	08.30 - 14.30	6 hrs	Showers, F3, Good Visibility, 8/8 Okta
10.06.20	2 (new)	08.36 - 14.36	6 hrs	Showers, F3-4, Good Visibility, 8/8 Okta
10.06.20	3	09.09 - 15.09	6 hrs	Showers, F3-4, Good Visibility, 8/8 Okta
10.06.20	4	08.43 - 14.43	6 hrs	Showers, F4, Good Visibility, 8/8 Okta
12.06.20	5	08.36 - 14.36	6 hrs	Dry, F3-4, Good Visibility, 8/8 Okta
12.06.20	6	08.40 - 14.40	6 hrs	Dry, F4, Poor to Good Visibility, 8/8 Okta
10.06.20	7	09.10 - 15.10	6 hrs	Showers, F3, Good Visibility, 8/8 Okta
12.06.20	8	08.41 - 14.41	6 hrs	Dry, F3-4, Poor to Good Visibility, 8/8 Okta
10.06.20	9	08.25 - 14.25	6 hrs	Showers, F2, Good Visibility, 8/8 Okta
10.06.20	10	08.20 - 14.20	6 hrs	Showers, F3, Good Visibility, 8/8 Okta
16.07.20	1	08.30 - 14.30	6 hrs	Dry, F1-2, Good Visibility, 2-7/8 Okta
16.07.20	2 (new)	08.49 - 14.49	6 hrs	Dry, F3-4, Poor to Good Visibility, 2-8/8 Okta
16.07.20	3	09.10 - 15.10	6 hrs	Dry, F1, Good Visibility, 2-6/8 Okta
16.07.20	4	08.40 - 14.40	6 hrs	Dry, F2-3, Good Visibility, 4-8/8 Okta
16.07.20	5	09.20 - 15.20	6 hrs	Dry, F3, Good Visibility, 4-5/8 Okta
16.07.20	6	08.45 - 14.48	6 hrs	Dry, F2, Good Visibility, 5/8 Okta
16.07.20	7	08.45 - 14.45	6 hrs	Dry, F5, Good Visibility, 3-8/8 Okta
16.07.20	8	08.25 - 14.25	6 hrs	Dry, F0, Poor to Good Visibility, 4/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
15.07.20	9	09.00 - 15.00	6 hrs	Occ. showers, F4, Poor to Good Visibility, 4-8/8 Okta
15.07.20	10	08.53 - 14.53	6 hrs	Dry, F4, Good Visibility, 8/8 Okta
26.08.20	1	08.55 - 14.55	6 hrs	Dry, F1, Good Visibility, 3-6/8 Okta
26.08.20	2 (new)	08.45 - 14.45	6 hrs	Mist at first, F3, Poor - Good Visibility, 3-6-8/8 Okta
26.08.20	3	08.39 - 14.39	6 hrs	Dry, F2, Good Visibility, 3/8 Okta
26.08.20	4	09.20 - 15.20	6 hrs	Dry, F2-3, Good Visibility, 6-7/8 Okta
26.08.20	5	08.15 - 14.15	6 hrs	Dry, F4-5, Good Visibility, 6-8/8 Okta
26.08.20	6	09.10 - 15.10	6 hrs	Dry, F1-2, Good Visibility, 6-8/8 Okta
26.08.20	7	08.50 - 14.50	6 hrs	Dry, F4-5, Good Visibility, 4-6/8 Okta
26.08.20	8	08.31 - 14.31	6 hrs	Dry, F3, Good Visibility, 7/8 Okta
28.08.20	9	08.44 - 14.44	6 hrs	Showers, F3-4, Good Visibility, 6-8/8 Okta
28.08.20	10	09.15 - 15.15	6 hrs	Showers, F3, Good Visibility, 8/8 Okta

Hinterland Survey Schedule Ballinagree, Breeding Season 2020.

Date	Time (24hrs)	Survey Effort (hrs & mins)	Weather
27.04.20	09.00 - 15.40	6 hrs 40 mins	Dry; F2; Good Visibility; Cloud 6/8
20.05.20	12.15 - 14.15	2 hrs	Dry; F3-4; Good Visibility; Cloud 4-6/8
26.07.20	09.30 - 17.05	7 hrs 35 mins	Occasional light showers; F3-4; Good Visibility; Cloud 7-8/8

VP Survey Schedule Ballinagree, Winter Season Survey 2020/2021.

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
15.10.20	1	09.00 - 15.00	6 hrs	Dry; F1; Poor to Good Visibility; 8/8 Okta
15.10.20	2 (new)	08.50 - 14.30	6 hrs	Dry; F2; Poor to Good Visibility; 8/8 Okta
15.10.20	3	09.22 - 15.22	6 hrs	Dry; F3; Poor to Good Visibility; 8/8 Okta
15.10.20	4	09.00 - 15.00	6 hrs	Dry; F2-3; Poor to Good Visibility; 7/8 Okta
13.10.20	5	08.31 - 14.31	6 hrs	Dry; FX; Poor to Good Visibility; 4-8/8 Okta
13.10.20	6	08.25 - 14.25	6 hrs	Dry; F3; Poor to Good Visibility; 8/8 Okta
15.10.20	7	10.05 - 16.06	6 hrs	Dry; F3; Poor to Good Visibility; 6-8/8 Okta
13.10.20	8	09.10 - 15.10	6 hrs	Drizzle at first; F3; Poor to Good Visibility; 7-8/8 Okta
13.10.20	9	09.14 - 15.14	6 hrs	Drizzle at first; F3-4; Poor to Good Visibility; 8/8 Okta
13.10.20	10	09.03 - 15.03	6 hrs	Drizzle at first; F2-3; Poor to Good Visibility; 3-6/8 Okta
27.11.20	1	08.30 - 14.30	6 hrs	Dry; F0; Poor to Good Visibility; 4/8 Okta
25.11.20	2 (new)	09.20 - 15.20	6 hrs	Dry; F2-3; Poor to Good Visibility; 1/8 Okta
27.11.20	3	09.30 - 15.30	6 hrs	Dry; F2; Good Visibility; 8/8 Okta
27.11.20	4	09.11 - 15.11	6 hrs	Dry; F1; Poor to Good Visibility; 8/8 Okta
25.11.20	5	08.30 - 14.30	6 hrs	Dry; F3; Good Visibility; 2/8 Okta
25.11.20	6	08.30 - 14.30	6 hrs	Dry; F2; Good Visibility; 8/8 Okta
27.11.20	7	09.10 - 15.10	6 hrs	Dry; F3-4; Poor to Good Visibility; 4-8/8 Okta
25.11.20	8	08.57 - 14.57	6 hrs	Dry; F1; Poor to Good Visibility; 2-8/8 Okta
25.11.20	9	08.36 - 14.36	6 hrs	Dry; F2; Poor to Good Visibility; 2/8 Okta
25.11.20	10	09.00 - 15.00	6 hrs	Dry; F3; Poor to Good Visibility; 8/8 Okta
08.12.20	1	08.30 - 14.30	6 hrs	Dry; F2; Good Visibility; 2/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
08.12.20	2 (new)	09.00 - 15.00	6 hrs	Showers; F4; Poor to Good Visibility; 4-8/8 Okta
08.12.20	3	09.05 - 15.05	6 hrs	Dry; F3-4; Good Visibility; 3/8 Okta
08.12.20	4	08.45 - 14.45	6 hrs	Showers; F4; Good Visibility; 4/8 Okta
10.12.20	5	08.45 - 14.45	6 hrs	Showers; F2-4; Poor Visibility; 8/8 Okta
10.12.20	6	08.45 - 14.45	6 hrs	Showers; F1; Poor to Moderate Visibility; 8/8 Okta
08.12.20	7	08.30 - 14.30	6 hrs	Showers; F2; Poor Visibility; 8/8 Okta
08.12.20	8	08.46 - 14.46	6 hrs	Dry; F4; Good Visibility; 4/8 Okta
10.12.20	9	08.39 - 14.39	6 hrs	Showers; F3; Poor to Moderate Visibility; 8/8 Okta
10.12.20	10	08.28 - 14.28	6 hrs	Showers; F2-3; Poor to Moderate Visibility; 8/8 Okta
22.01.21	1	09.00 - 15.00	6 hrs	Snow showers; F3; Moderate to Good Visibility; 4-8/8 Okta
22.01.21	2 (new)	10.05 - 16.05	6 hrs	Snow showers; F2-3; Poor to Good Visibility; 8/8 Okta
22.01.21	3	09.30 - 15.30	6 hrs	Showers; F3-4; Good Visibility; 3-8/8 Okta
22.01.21	4	09.08 - 15.08	6 hrs	Showers; F1-2; Good Visibility; 4/8 Okta
21.01.21	5	08.55 - 14.55	6 hrs	Showers; F3; Good Visibility; 1/8 Okta
22.01.21	6	08.50 - 14.50	6 hrs	Dry; F3; Poor to Good Visibility; 8/8 Okta
22.01.21	7	09.35 - 15.35	6 hrs	Snow showers; F5; Poor to Good Visibility; 8/8 Okta
21.01.21	8	09.13 - 15.13	6 hrs	Showers; F1-3; Moderate to Good Visibility; 4/8 Okta
21.01.21	9	09.25 - 15.25	6 hrs	Showers; F3-5; Poor to Moderate Visibility; 1-8/8 Okta

Date	VP	Time (24hrs)	Survey Effort (hrs/mins)	Weather
21.01.21	10	08.50 - 14.50	6 hrs	Showers; F2; Good Visibility; 1-8/8 Okta
22.02.21	1	09.00 - 15.00	6 hrs	Dry; F1; Good Visibility; 7/8 Okta
25.02.21	2 (new)	08.52 - 14.52	6 hrs	Dry; F3-4; Good Visibility; 1-3/8 Okta
22.02.21	3	09.10 - 15.10	6 hrs	Dry; F4; Good Visibility; 8/8 Okta
22.02.21	4	09.00 - 15.00	6 hrs	Showers; F2; Good Visibility; 4/8 Okta
25.02.21	5	09.03 - 15.03	6 hrs	Dry; F2-3; Good Visibility; 2/8 Okta
25.02.21	6	09.20 - 15.20	6 hrs	Dry; F1-3; Good Visibility; 1-5/8 Okta
22.02.21	7	09.16 - 15.16	6 hrs	Dry; F5-7; Moderate to Good Visibility; 8/8 Okta
25.02.21	8	09.10 - 15.10	6 hrs	Dry; F2; Good Visibility; 2/8 Okta
25.02.21	9	08.58 - 14.58	6 hrs	Dry; F2; Good Visibility; 2/8 Okta
25.02.21	10	09.14 - 15.14	6 hrs	Showers; F2; Good Visibility; 1-8/8 Okta
16.03.21	1	08.55 - 14.55	6 hrs	Dry; F3; Good Visibility; 1-8/8 Okta
16.03.21	2 (new)	09.09 - 15.09	6 hrs	Dry; F2-3; Moderate to Good Visibility; 4-8/8 Okta
16.03.21	3	08.52 - 14.52	6 hrs	Dry; F3; Good Visibility; 3/8 Okta
16.03.21	4	09.15 - 15.15	6 hrs	Dry; F3-5; Moderate to Good Visibility; 2-8/8 Okta
30.03.21	5	08.37 - 14.37	6 hrs	Dry; F1; Poor to Good Visibility; 0-8/8 Okta
30.03.21	6	09.10 - 15.10	6 hrs	Dry; F1; Poor to Good Visibility; 3-8/8 Okta
16.03.21	7	09.15 - 15.15	6 hrs	Dry; F3; Poor to Good Visibility; 3-8/8 Okta
30.03.21	8	09.00 - 15.00	6 hrs	Dry; F2; Poor to Good Visibility; 3-8/8 Okta
16.03.21	9	08.45 - 14.45	6 hrs	Showers; F2; Poor to Good Visibility; 8/8 Okta
16.03.21	10	08.40 - 14.40	6 hrs	Mist at first; F2-3; Poor to Good Visibility; 0-8/8 Okta

Avifauna – Red Grouse Tape Lure Survey Schedule

Red Grouse Survey Schedule Ballinagree, March 2019

Date	Survey	Time (24 hrs)	Red Grouse Transects	Weather
27.03.19	Red Grouse Tape Lure	11.58 - 12.16	1-3	Dry; F1-2; 1-3/8 Okta; Good Visibility

Avifauna Transect and Point Count Survey Schedules

Breeding Bird Transect and Point Count Survey Schedule Ballinagree, Breeding Season 2017.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
11.05.17	T1 - T5, PC1 - PC6	10.00 - 14.25	1	Dry; F1; 0-6/8 Okta; Good Visibility
29.06.17	T1 - T5, PC1 - PC6	09.45 - 13.30	2	Dry; F3-4; 8/8 Okta; Good Visibility

Breeding Bird Transect and Point Count Survey Schedule Ballinagree, Breeding Season 2018.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
08.06.18	T1 - T5, PC1 - PC6	08.25 - 13.00	1	Dry; F1; 2/8 Okta; Good Visibility
06.07.18	T1 - T5, PC1 - PC6	09.25 - 13.35	2	Dry; F1; 4/8 Okta; Good Visibility

Breeding Bird Transect and Point Count Survey Schedule Ballinagree, Breeding Season 2019.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
27.05.19	T1 - T7, PC1 - PC8	07.59 - 15.45	1	Occ. Showers; F3-4; 4-8/8 Okta; Good Visibility
01.07.19	T1 - T7, PC1 - PC8	07.18 - 14.42	2	Dry; F4; 6/8 Okta; Good Visibility

Breeding Bird Transect and Point Count Survey Schedule Ballinagree, Breeding Season 2020.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
11.05.20	PC1 - PC8	10.10 - 14.40	1	Dry; F2; 2/8 Okta; Good Visibility
20.05.20	T1 - T7	06.55 - 11.30	1	Dry; F3-4; 4-6/8 Okta; Good Visibility
26.06.20	PC1, PC2, PC6, T1, T5, T6, T7	08.06 - 11.00	2	Dry; F0-1; 2/8 Okta; Good Visibility
26.06.20	T2, T3, T4, PC3, PC4, PC5, PC7, PC8	07.49 - 11.00	2	Light drizzle; F1; 8/8 Okta; Good Visibility

Winter Bird Transect and Point Count Survey Schedule Ballinagree, Winter Season 2017/2018.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
23.11.17	T1 - T5, PC1 - PC6	09.51 - 13.30	1	Dry; F1-3; 2-8/8 Okta; Good Visibility
25.01.18	T1 - T5, PC1 - PC6	09.34 - 14.00	2	Showers; F1-2; 4/8 Okta; Good Visibility
21.02.18	T1 - T5, PC1 - PC6	09.34 - 14.00	3	Dry; F0-1; 1-8/8 Okta; Good Visibility

Winter Bird Transect and Point Count Survey Schedule Ballinagree, Winter Season 2017/2018.

Date	Transect & Point Count	Time (24hrs)	Survey	Weather
16.10.19	T1 - T7, PC1 - PC8	09.30 - 11.30	1	Dry; F1-3; 1-5/8 Okta; Good Visibility
04.02.20	T1 - T7, PC1 - PC8	08.30 - 11.58	2	Dry; F3-4; 6/8 Okta; Good Visibility

Habitat & Flora Survey Schedule

Date	Time (24hrs)	Activity	Weather *
30.08.2018	10.00-18.00	Habitat Walkover	C:5/8-8/8, R: Showers, F:2-3, V: Medium
06.09.2018	10.00-17.00	Habitat Walkover	C8/8, R: Drizzle, F3-4, V: Poor
14.09.2018	10.00-17.00	Habitat Walkover	C:8/8, R:0, F:2, V: Good
25.09.2018	10.00-17.00	Habitat Walkover	C:8/8, R:0, F3-4, V: Good
13.08.2019	10.00-16.00	Habitat Walkover	C:2/8, R:0, F2, V: Good
22.08.2019	10.00-17.00	Habitat Walkover	C:8/8, R:0, F:1-2, V: Good
28.08.2019	09.30-17.00	Habitat Walkover	C:3/8, R:0, F3, V: Good
13.09.2019	10.00-17.00	Habitat Walkover	C:3/8, R:0, F2, V: Good
22.10.2019	10.00-15.00	Habitat Walkover	C:8/8, R: 0, F1-2, V: Good
22.10.2020	09.00-17.00	Quadrat Survey/Grid Route/Habitat Checks (e.g. Grid Route Directional Drilling etc.)	C:3/8, R:0, F1-2, V: Good
13.11.2020	09.00-16.00	Grid Route Surveys	C:8/8, R:0, F 1-2, V: Good

*C = cloud cover; R = rain/precipitation; F = wind force; V = study site visibility

Non-Volant Mammal Survey Schedule

Survey Description	Dates
Walkover recording field sightings & signs	February (21-23rd) 2018
Field walkover of extended study area recording field sightings and signs	November (29-30) 2018
Walkover of sections of woodland and woodland edge at north of study area	February (12th) 2019
Walkover recording field sightings and signs (two ecologists)	September 13 th 2019
Walkover and camera deployments recording field sightings & signs	October (23rd) 2019

Trail Camera Deployment Locations and Dates (IDs linked to Mapping)

Deployment ID	Deployment Date	Recording Days	Latitude	Longitude
CM1	20-May-17	57	52.0009	-8.93791
CM2	20-May-17	21	52.0037	-8.93676
CM3	12-May-17	60	52.0025	-8.9398
CM4	12-May-17	18	52.0034	-8.9229
CM5	17-May-17	42	52.0009	-8.94337
CM6	12-May-17	42	52.0024	-8.94307
CM7	12-May-17	18	52.0035	-8.92291
CM8	12-May-17	18	52.0025	-8.91543
CM9	11-Jul-17	23	52.0003	-8.93657
CM10	12-May-17	19	52.0034	-8.92299
CM11	12-Jun-19	39	52.0104	-8.91791
CM12	12-Jun-19	25	52.0232	-8.95055
CM13	12-Jun-19	247	51.9931	-8.9317
CM14	12-Jun-19	177	52.0027	-8.96085
CM15	22-Feb-19	110	52.0069	-8.96346
CM16	12-Feb-19	120	51.993	-8.93527
CM17	12-Feb-19	120	51.9994	-8.93564
CM18	12-Feb-19	293	52.0002	-8.94363
CM19	03-Oct-18	58	52.0025	-8.94057
CM20	03-Oct-18	58	51.9925	-8.93205
CM21	03-Oct-18	55	52.0138	-8.95396
CM22	03-Oct-18	58	52.0024	-8.9619
CM23	03-Jun-18	8	51.9903	-8.93224
CM24	10-Mar-18	134	52.0134	-8.96817
CM25	10-Aug-18	54	52.0035	-8.91267
CM26	12-May-17	150	51.9963	-8.91248
CM27	15-Dec-17	96	51.9999	-8.91624
CM28	13-May-19	102	51.9965	-8.91243
CM29	21-Sep-20	67	52.0188	-8.94115
CM30	21-Sep-20	67	52.0247	-8.91952
CM31	21-Sep-20	67	52.0283	-8.90433
CM32	07-Aug-20	45	52.0113	-8.90556
CM33	07-Aug-20	45	52.0222	-8.90091
CM34	07-Aug-20	112	52.0299	-8.8891
CM35	23-Oct-19	37	52.0248	-8.90292

Bat Survey Schedule

Active Bat Surveys – dates and schedule

Active Surveys	Start Time	End Time	Weather	Notes
16-Jun-17	21:50	01:20	Mild, Dry, Wind F2, Cloud 2/8, 12-14 °C	Driven and walked transects
05-Aug-17	22:45	02:40	Mild, Dry, Wind F2, Cloud 1/8, 10-13 °C	Emergence checks (2 structures in area with roost potential), Driven and walked transects
18-Jun-18	21:40	02:05	Mild, Dry, Wind F2-3, Cloud 6/8, 11-16 °C	Emergence checks (Structure in area with roost potential), Driven and walked transects
25-Jul-18	22:00	01:15	Mild, Dry, Wind F1-2, Cloud 2/8, 13-17 °C	Driven and walked transects
24-May-19	21:00	00:55	Mild, Dry, Wind F2, Cloud 8/8, 10-15 °C	Driven and walked transects
30-Jul-19	21:45	01:25	Dry, Wind F3, Cloud 4/8, 10-12 °C	Emergence checks (Structure in area with roost potential), Driven and walked transects

Passive Bat Detector Deployment schedule (non SNH deployments) – ID linked to mapping

Deployment ID	Deployment Date	Number of Nights Recorded	Latitude	Longitude
BD1	17-Aug-18	49	51.992232	-8.933674
BD2	12-Jun-19	10	52.003394	-8.923238
BD3	30-May-17	17	52.005478	-8.918066
BD4	12-Feb-19	26	51.99932	-8.90283
BD5	06-Jul-18	19	52.00338	-8.933736
BD6	06-Dec-17	15	51.99571	-8.91258
BD7	16-Jan-19	27	52.00621	-8.91723
BD8	03-Oct-18	22	52.00339	-8.92324
BD9	12-May-17	17	52.00115	-8.94338
BD10	12-Nov-17	23	52.0035	-8.93334
BD11	26-Jan-18	28	51.99975	-8.91635
BD12	06-Jul-18	18	52.01005	-8.91758
BD13	19-Oct-18	12	52.01106	-8.943538
BD14	16-Jan-19	5	52.00197	-8.93994
BD15	26-Jun-19	27	52.02708	-8.91982
BD16	13-Jun-19	25	51.98777	-8.93256
BD17	16-Jun-19	56	52.00101	-8.93825
BD18	16-Jun-19	25	52.00649	-8.95594
BD19	12-Jun-19	18	52.00342	-8.96033
BD20	12-Jun-19	18	52.00235	-8.9616
BD21	17-Jul-19	23	52.00584	-8.95381
BD22	17-Jul-19	24	51.99651	-8.91236
BD23	17-Jul-19	23	52.02771	-8.92798
BD24	09-Aug-19	17	52.02834	-8.91933
BD25	09-Aug-19	17	52.03019	-8.89902
BD26	09-Aug-19	17	51.99187	-8.9335

SNH Bat Surveys details

Autumn 2019

Date [night of]	Sunset	Sunrise	Temp. °C*	Wind km/h*	Precipitation*	Bat_01c	Bat_01a	Bat_01b	Bat_09a	Bat_08b	Bat_03b	Bat_08a	Bat_06a	Bat_04	Bat_05b	Bat_07	Bat_12a	Bat_13	Bat_13b
28/08/19	20:32	06:41	13	4	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
29/08/19	20:30	06:43	15	11	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
30/08/19	20:28	06:45	15	15	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
31/08/19	20:25	06:46	11	7	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
01/09/19	20:23	06:48	12	6	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
02/09/19	20:21	06:50	13	6	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
03/09/19	20:19	06:51	15	7	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
04/09/19	20:16	06:53	11	9	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
05/09/19	20:14	06:55	10	6	Dry	☐	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
06/09/19	20:12	06:56	12	11	Dry	☐	✓	✓	✓	✓		☐	✓	✓	✓	✓	✓	✓	✓
29/10/19	17:13	07:24	9	17	Overcast	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
30/10/19	17:11	07:26	10	15	Light rain	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
31/10/19	17:09	07:28	12	6	Light rain	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
01/11/19	17:07	07:30	12	15	Light rain	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
02/11/19	17:06	07:31	8	11	Dry	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	

Date [night of]	Sun set	Sunrise	Temp. °C*	Wind km/h*	Precipitation*	Bat_01c	Bat_01a	Bat_01b	Bat_09a	Bat_08b	Bat_03b	Bat_08a	Bat_06a	Bat_04	Bat_05b	Bat_07	Bat_12a	Bat_13	Bat_13b
03/11/19	17:04	07:33	8	4	Light rain	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
04/11/19	17:02	07:35	9	13	Overcast	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
05/11/19	17:00	07:37	8	6	Dry	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
06/11/19	16:59	07:39	6	15	Dry	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
07/11/19	16:57	07:40	6	17	Dry	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
08/11/19	16:55	07:42	5	4	Dry	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
09/11/19	16:54	07:44	6	19	Light rain	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
10/11/19	16:52	07:46	7	11	Overcast	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	

Note: Light blue highlight indicates the 10 nights chosen for assessment of bat activity.

* <https://www.timeanddate.com/weather/@7869965/historic?month=6&year=2020>

Spring 2020

Date [night of]	Sunset	Sunrise	Temp °C	Wind k m/h	Precipitation	Bat_01c	Bat_01a	Bat_01b	Bat_09a	Bat_08b	Bat_03b	Bat_08a	Bat_06a	Bat_04	Bat_05b	Bat_07	Bat_11a	Bat_12a	Bat_13	Bat_13b	Met Mast [Ground] [Bat_03a]	Met Mast [High] [Bat_03a]
30/04/20	20:59	06:05	8	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
01/05/20	21:01	06:03	7	9	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
02/05/20	21:03	06:01	8	7	Light rain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
03/05/20	21:04	05:59	9	4	Overcast	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
04/05/20	21:06	05:57	11	17	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
05/05/20	21:08	05:56	9	15	Rain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
06/05/20	21:09	05:54	10	11	Light rain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
07/05/20	21:11	05:52	11	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
08/05/20	21:12	05:50	11	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
09/05/20	21:14	05:49	15	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10/05/20	21:16	05:47	8	15	Overcast	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Light blue highlight indicates the 10 nights chosen for assessment of bat activity.

Summer 2020

Date [night of]	Sun set	Sunrise	Temp. °C	Wind km/h	Precipitation	Bat_01	Bat_03	Bat_02	Bat_04	Bat_05	Bat_06	Bat_07	Bat_08	Bat_09	Bat_10	Bat_11	Bat_12	Bat_13	Bat_14	Bat_15	Met Mast [Ground]	Met Mast [High]
06/06/20	21:51	05:17	10	19	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
07/06/20	21:52	05:17	11	9	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
08/06/20	21:53	05:16	11	7	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
09/06/20	21:54	05:16	11	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10/06/20	21:54	05:16	9	13	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11/06/20	21:55	05:15	12	15	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12/06/20	21:56	05:15	14	11	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13/06/20	21:56	05:15	13	4	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
14/06/20	21:57	05:15	13	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15/06/20	21:57	05:15	13	6	Dry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Light blue highlight indicates the 10 nights chosen for assessment of bat activity.

Turbine Areas, Habitats & TDR/GCR Schedule 2021

Date	Start Time	End Time	Weather	Notes
18-Jun-21	09:30	17:00	Sunny spells, dry, CC 4/8, Good vis	Walkover of Turbines 16, 17, 15, 14, 13, 20, 19, 18 re mammals, invasive plants and any other points of interest
29-Jun-21	09:00	15:45	Sunny, dry, CC 0/8 - 2/8, Good vis	Walkover of Turbines 3, 2, 1, 12, 11, 10, 6, 4 re mammals, invasive plants and any other points of interest
30-Jun-21	08:15	12:15	Sunny, CC 1/8, dry, good vis	Walkover of Turbines 9, 8, 5 re mammals, invasive plants and any other points of interest. Walkover of three small areas near VP5 to confirm habitats present.
21-Jul-21	13:30	14:15	Sunny, CC 4/8, dry, good vis	Walkover of Turbine, 7 re mammals, invasive plants and any other points of interest.
24-Jul-21	c. 10.00	c. 17.00	Sunny, CC 0/8, dry very calm	Windscreen survey of TDR and GCR routes re points of interest.
6-Oct-21	c. 14.00	n/a	Overcast, dry	GCR – potential river/bridge crossing, biodiversity points of interest.

Statement of Competence – Ecology Ireland Field Team

Aidan Duggan (Avian Surveys, Bat Surveys, Marsh Fritillary Surveys)

Aidan has 16 years of experience working as a self-employed field surveyor specialising in bird surveys. As part of this work he has undertaken Vantage Point surveys, Hen Harrier surveys (nest monitoring and winter roost watches), Red Grouse surveys, Merlin Surveys, White tailed Eagle surveys, breeding and wintering wader and wildfowl surveys, common bird census, countryside bird surveys, intertidal bird surveys, as well as transects and hinterland surveys. He has considerable experience conducting bird surveys on wind farms and power grid routes. Aidan has a lifelong interest in Ornithology and was a voting member of the Irish Rare Bird Committee (IRBC) from 1999 to 2005.

Athena Michaelides (Avian Surveys, Grid Route and TDR Walkovers, GIS Mapping)

Athena Michaelides (BSc Zoology & Animal Biology) has over five years of experience as a professional ecological consultant. She is a former secretary of the Irish Wildlife Trust with particular experience in field surveys and reporting as part of Ecological Impact Assessments. Athena formerly was employed by Ryan Hanley Consulting Engineers and now works as an independent ecologist.

Austin Cooney (Avian Surveys)

Austin has over 40 years birdwatching experience in Ireland and abroad. He has over six years of experience as a self-employed sub-contractor to various Environmental and Ecology companies in Ireland where he has carried out VP Surveys, Breeding Surveys, Roost watches, Estuary Surveys, Red Grouse and Merlin Surveys and Hinterland Surveys.

Dr. Allan Mee (Avian Surveys)

Allan has 35 years of experience as a professional ornithologist in Ireland, UK and US working on threatened bird populations and species reintroduction projects including California condor and White-tailed Eagle as project manager since 2007. Allan has been working as a self-employed ecological consultant over the last six years including organising a number of national surveys for National Parks & Wildlife Service (hen harrier, ring ouzel), EU LIFE Nature and EIP projects (RaptorLIFE, Duhallow EIP) as well as waterbird and raptor surveys in relation to road and wind farm project. These included writing Appropriate Assessment and Natura Impact Statements.

Barry O'Mahony (Avian Surveys)

Barry O'Mahony has a life-long interest in birds and birdwatching and is a licensed Bird Ringer. He is a graduate of UCC with a B.Sc (General) in Zoology and has been a self-employed freelance bird surveyor since 2007. He has worked as Research Assistant on studies of Hen Harrier, Dipper and a variety of seabirds involving wing-tagging, the attachment and retrieval of data loggers and radio tracking. His survey work has included shorebird distribution monitoring, IWeBS, VP watches at windfarm sites, harrier roost watches, hinterland surveys and Vantage Point selection and Assessment.

Ciaran Cronin (Avian Surveys)

Ciaran has been an active naturalist and birdwatcher for over 30 years with a particular passion for birds. Working as a professional ornithologist and ecologist for over 20 years, he has a wide range of experience along with a postgraduate qualification in 'Ecological Assessment' from University College Cork (1st Class Honours). He is an expert in both bird and marine mammal identification, runs bird identification courses nationally for professional ecologists, is a trainer/assessor for the international ESAS seabird group, former member of the Irish Rare Birds Committee and international wildlife tour guide with National Geographic/Lindblad Expeditions. He is also a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM). His highly expert level knowledge of bird identification, both by sight and sound, allows for maximum detection of bird species through all habitats, at all times of year and he combines this with many years of experience at implementing rigorous survey protocols, consistent with guidance and to the highest standards. Although he has particular expertise with birds of prey and seabirds, his ornithological skills extend at high level across the complete range of Irish bird species.

Claire Deasy (Avian Surveys)

Claire has over 18 years of experience in ecological and environmental impact assessment including project management, surveying, data analysis and report writing in support of planning applications, EIAR's, Article 6 Appropriate Assessments and planning compliance reporting. She is a self-employed ecological consultant trading as EcoSource Consulting. Claire has experience and training across a wide variety of field skills including; Avian Surveys, Botanical and habitat surveys, Habitat classification and GIS mapping, Invasive Species Surveys, Ecological Clerk of works supervision and Project Management.

Claire has also contributed to the design and implementation of Habitat & Species Management Plans for EU protected species such as the Annex I Hen Harrier and Annex II Marsh Fritillary Butterfly.

Dr Daphne Roycroft (Avian Surveys, EIAR Reporting)

Daphne has over 10 years of experience in the field of Ecological Consultancy and holds a BSc and PhD in Ecology from the National University of Ireland, Cork. She is a self-employed Ecological consultant, trading as Croft Ecology. Daphne is experienced in the preparation of Ecological Impact Assessment Reports and Appropriate Assessment screening appraisals as well as Natura Impact Statements for a variety of projects including wind farms, solar farms, roads, pipelines, residential developments, ports and landfill sites. She has published research papers in several peer-reviewed scientific journals and has lectured on several degree and certificate courses in The National University of Ireland, Cork.

Eamonn Delaney (EIAR Reporting)

Eamonn holds a B.Sc. (Hons) in Science, and M.Sc. in Environmental Science. Eamonn has 14 years' experience in ecological consultancy. Eamonn is a full and Chartered Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Eamonn is a member of the Botanical Society of Britain and Ireland (BSBI) and regularly attends local and regional BSBI field meetings in addition to carrying out recording for the proposed BSBI 2020 Atlas, in north Co. Galway and south Co. Mayo. Eamonn has extensive experience in habitat, botanical, ornithological and mammal surveying, Ecological Clerk of Works, habitat management and site-specific mitigation.

Éinne Ó Cathasaigh (Avian Surveys)

Éinne Ó Cathasaigh recently completed a MSc in Marine Biology at University College Cork, and previously obtained a BA in Zoology from Trinity College Dublin. For his master's dissertation, "Keeping your Distance on Porpoise", Éinne studied data collected from the OBSERVE program, and used spatial distribution modelling to explore the spatial relationship between bottlenose dolphins and harbor porpoises. As an early career researcher, he worked at the Marine Institute as a bursar cataloguing the benthic invertebrate specimen library while carrying out a ten year report into benthic community health in Irish aquaculture farms. Éinne also gave tours at the Zoological Museum during his time at TCD. Currently he is working as a freelance consultant ecologist and established Éinne Ó Cathasaigh Ecological Service in 2020. He primarily works with bats, monitoring their activity at wind farms and other construction redevelopment projects.

Gerard McGrath (Avian Surveys)

Ger Graduated from UCC in 2012 with an honours degree in Zoology, and subsequently in 2013 with a Masters degree in Ecological Assessment. There under the tutelage of current UCC president John O' Halloran, he developed a keen interest in birds and bats. He worked full time as a freelance surveyor for a number of years before moving into education and undertaking a Masters in Education (Biology and Agricultural Science). He currently teaches in St. Augustine's College Dungarvan full time, but still returns to the field to carry out surveys in summertime.

Dr Isobel Abbott (Avian Surveys, Mammal Surveys, Bat Surveys)

Isobel Abbott is a freelance ecological consultant, specialising for over 10 years in bat surveys, monitoring and mitigation. She graduated first in class in 2007 with a BSc in Zoology, and in 2012 with a PhD in Ecology from University College Cork. She has published a number of scientific papers relating to bat ecology and conservation. Isobel has worked on a variety of projects including national bat surveys, wind farms, solar farms, road construction, bridge repairs, quarries, and residential and industrial developments. She has extensive experience of designing and conducting bat surveys, evaluating potential impacts, and designing appropriate mitigation for a range of bat species. Isobel has been granted >35 NPWS bat licenses associated with planning permission applications or research. She currently holds nationwide NPWS licenses to capture/handle bat species, and to disturb bat roosts for the purpose of impact assessment.

Dr Gavin Fennessy (Project Manager, Avian Surveys, Mammal Surveys, Bat Surveys, EIAR reporting)

Dr Gavin Fennessy (BSc PhD MCIEEM) is the Director & Principal Ecologist of Ecology Ireland Wildlife Consultants, a consultant ecologist with over 20 years of experience in environmental consultancy.

Dr Fennessy has contributed to and Project Managed numerous ecological impact assessment projects including EClA, EIA, AA, SEA *etc.* Gavin is also a trained and experienced Expert Witness having presented expert testimony at several An Bord Pleanála Oral Hearings. He is also an experienced lecturer and has regularly contributed to B.Sc. Env. Sc. courses at UCC. Dr Gavin Fennessy has led the ecological impact assessment and associated ecology team regarding terrestrial biodiversity at the proposed wind energy study area here from 2017-2021.

John Deasy (Avian Surveys, Habitat Surveys, Mammal Surveys, Bat Surveys, Marsh Fritillary Surveys)

John is an independent ecological consultant with experience across a range of ecological disciplines including botanical and habitat surveys, bird surveys, mammal surveys and protected invertebrate surveys. He has over 7 years of experience as a professional ecologist and has undertaken a range of botanical and habitat surveys including baseline surveys for renewable energy projects, shared-use greenways and domestic and commercial properties. These surveys have included non-native invasive species surveys, rare species surveys and evaluations of habitats listed on Annex I of the EU Habitats Directive. John holds a MSc. in Ecological Assessment and BSc. in Earth and Environmental Science from University College Cork and is a member of the Botanical Society of Britain and Ireland.

Dr Katherine Kelleher (Avian Surveys, EIAR reporting)

Katherine Kelleher is a graduate of University College Cork with a BSc in Zoology and PhD in Ecology, and established Kelleher Ecology Services in 2011. She has over 15 years of experience in ecological consultancy, acting as project manager on a range of ecological assessments & projects including solar/wind farm, road, gas pipeline, landfill, grid connection, industrial development, retail and housing. Katherine has significant experience of research, evaluative and analytical work in relation to planning applications, planning compliance, commitments, licensing, baseline assessments, scoping studies *etc.*

Mark Shorten (Avian Surveys)

Mark Shorten has been birding activity since 1975 and has been involved in many conservation projects and surveys since then. He has contributed to the Winter Atlas, Breeding Atlas 1988-91 and 2007-11, Chough Survey 1993, Cork Seabird survey 1985, Cork Harbour Counts 1978-2005, country bird survey and Dragonfly Atlas. He was editor of the Cork Bird Report 1990-95 and Cork bird recorder 1990-2021. He is joint author of the forth coming 'The Birds of County Cork'. He wrote the original proposal to create a Harpers Island bird reserve and is involved with its management. Since 2018 he has worked on the BRIDE Project as bird surveyor and scoring Results Based Payments. Since 2019 he has worked as a bird surveyor on windfarm projects in Kerry, Cork, Offaly, Laois and Carlow. Waterfowl monitoring has been carried out for INIS and Atkins. He has a particular interest in bird sound recording and has developed an expertise in Noctuid and bird call identification. He has sound recorded over 130 species in Ireland.

Michelle O'Neill (Avian Surveys, Habitat Surveys, Mammal Surveys, Bat Surveys, EIAR reporting, Grid Route Walkovers)

Michelle (BSc Ecology University of Aberdeen, Diploma Field Ecology UCC) has over 10 years of experience working as an ecological consultant within the public and private sector on projects that include habitat and botanical surveys, breeding and winter bird surveys, mammal surveys, data analysis, assessment and report writing. To date, she has completed habitat and botanical surveys for a range of projects as part of National Surveys, Ecological Monitoring, Ecological Impacts Assessments (Ecia/EIAR) and Appropriate Assessment (AA/NIS). She has a particular interest in botany and habitats and has worked on an Irish semi-natural grassland survey (2009—2012) and a habitat mapping project for the provision of a Teagasc pilot methodology for farmland habitat assessment of sustainability scheme.

Paul Troake (Avian Surveys)

Paul Troake is an experienced ornithologist with excellent fieldwork skills, stemming from a lifelong passion for birds and birding. His career path involved warden positions on several English nature reserves before moving to Ireland over 14 years ago, since when he has been undertaking birds survey work for Birdwatch Ireland, UCC and numerous environmental consultancies. Much of his recent work has focused on vantage point bird surveys for wind farm developments, and to a lesser extent other surveys such as breeding raptors, walkovers, transects and point counts, amounting to over 600 days in total on 40 sites across Ireland. Additional experience has been gained on offshore boat surveys in the Irish Sea following qualification in ESAS (European Seabirds at Sea) survey methodology. He has earned a reputation for reliability with observation and data handling skills.

Tony Nagle (Avian Surveys)

Tony Nagle has a BSc in Environmental Management, an MSc in Ecological Assessment and is a member of the Chartered Institute of Ecology and Environmental Management. He has over 30 years of experience in bird surveying including birds of prey, waders, wildfowl and nocturnal species. He has participated in the Irish Wetland Bird Survey since it began in 1994 and the Countryside Bird Survey since 1999 and continues to be involved in both surveys. He was a regional organiser of the 2005, 2010 and 2015 National Hen Harrier Surveys and a co-author of each of the reports and he was a regional organiser and validator for the *Bird Atlas* (2013). He has been involved in numerous surveys for wind energy, road construction and pipe-laying projects.

Rory Dalton (Avian Surveys, Mammal Surveys, Bat Surveys)

Rory is an ecologist with eight years of experience with a BSc. Hons in Environmental Science from University College Cork. He worked for three years as an ecologist with a consultancy, and for the last five years he has been running his own company. While his expertise is aquatic ecology, he carries out general work in the areas of birds, mammals and habitats. The projects he is involved with range in size from small bridge surveys to the largest wind energy project in the country and the largest water quality project in Europe. He carries out work for a number of County Councils, State Bodies, Semi-State Bodies, Engineering Consultants, Ecology Consultants, Environmental Consultants and Laboratories.

Tom O'Donnell (Bat Surveys, EIAR Reporting)

Tom O'Donnell is a Chartered Environmentalist and a full member of the Chartered Institute of Ecology and Environmental Management. He was awarded a BSc in Environmental and Earth System Science [Applied Ecology] from UCC in 2007 and an MSc in Ecological Assessment in 2009, both from UCC. He has gained significant experience in ecological assessment and environmental management over the last 12 years of professional employment. Tom has particular experience in bat survey, bat conservation and bat call sonogram analysis using Kaleidoscope Pro.

Appendix 8A.2

Biodiversity Evaluation Scheme¹.

¹ amended after NRA 2009 and Nairn & Fossitt 2004

Biodiversity Evaluation Criteria

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level*) of the following:
 - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive and/or;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
- Major salmon river fisheries.

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level*) of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas'** of the habitat types listed in Annex I of the Habitats Directive.
- Major trout river fisheries.
- Commercially important coarse fisheries.
- Waterbodies with major amenity fishery value.

County Importance:

- Area of Special Amenity^.
- Area subject to a Tree Preservation Order^.
- Area of High Amenity^, or equivalent, designated under the County Development Plan.

Biodiversity Evaluation Criteria

- Resident or regularly occurring populations (assessed to be important at the County level*) of the following:
 - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas** of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP) if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
- Small waterbodies with known salmonid populations or with good potential salmonid habitat.
- Large waterbodies with some coarse fisheries value.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP if this has been prepared.
- Resident or regularly occurring populations (assessed to be important at the Local level*) of the following:
 - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality.
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
- Small waterbodies with some coarse fisheries value or some potential salmonid habitat.
- Waterbodies with unpolluted 'High' water quality status (Q4-5, Q5).

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife.
- Sites or features containing non-native species that are of some importance in maintaining habitat links.
- Waterbodies with no current fisheries value, no significant potential fisheries value, poor fisheries habitat.

Appendix 8A.3

NPWS Recommended Methodology for Assessing the Impacts of Wind Farms on Breeding Hen Harrier.

NPWS RECOMMENDED METHODOLOGY FOR ASSESSMENT OF IMPACTS OF PROPOSED WINDFARMS ON BREEDING HEN HARRIER WITHIN THE KNOWN RANGE OF THE SPECIES IN IRELAND

Of the two main threats to Hen Harriers from windfarms (collision and displacement), the possibility of indirect habitat loss, or displacement, if birds avoid a windfarm area is seen as the most immediate issue. Research to improve assessments of collision risk is ongoing in other countries; the proportion of the breeding population at risk from windfarms that have planning permission at present is small. Other proposed windfarms, within areas of importance for Hen Harrier, should be subject to Environmental Impact Assessment.

RELEVANT SPECIES

Although these recommendations focus on the Hen Harrier as the species of concern, breeding Short-eared Owl may possibly occur at some sites, in which case an assessment of site importance should be made using the same methodology, at times of day appropriate to the species.

ASSESSMENT OF SITE IMPORTANCE

Nine upland areas have been identified by Dúchas as being of national importance for Hen Harrier. All areas of heath/bog habitats within the indicative boundaries of these areas lie within 5 km of known nest sites located during the 1998-2000 survey, *i.e.* within the normal foraging range of the male of each pair. Any proposed development, which may have impacts on such habitats, should be subject to a detailed survey, to determine Hen Harrier usage for hunting (foraging).

Important aspects to be considered in an assessment are:

The numbers and breeding success of Hen Harriers that may forage in the area, ideally within 5 km of the proposed development site,

The time spent by Hen Harriers in all parts of the site,

The cumulative impact of other windfarms in the area that have been granted planning permission,

Spatial variation in an area's importance to foraging Hen Harriers when:

either occupancy or breeding success are below normal, fire, overgrazing or turbary temporarily reduce the vegetation cover and hence its value to foraging birds, nest locations change from year to year.

METHODS

Survey of breeding occupancy

An appropriate survey in good weather conditions, with at least two visits in April of breeding pairs within 5 km of the site from outer turbines and a second series of visits in July to determine breeding success, would be necessary to interpret results from foraging observations. In years with a run of poor weather during April and May, an intermediate series of observations may be required in June to confirm occupancy by breeding pairs or locate late arriving pairs. Useful information is given in Gilbert *et al.* (1998).

Methodology should be detailed giving dates of survey, map of area searched, and habitat types searched. Results should not include detailed nest locations in public documents (*e.g.* EIS), but should include minimum distance from the development site.

Data on the number and distance from the site of breeding pairs recorded in the 1998-2000 survey (Norriss *et al.* 2002), and in subsequent years where available, can be provided by Dúchas (contact dnorriss@duchas.ie).

Survey of proposed development site

Description of survey area:

The assessment area should include a strip at least 500m beyond the outermost turbines. A habitat map of the study area should be produced based on the habitat categories listed in Appendix 1. A more detailed habitat map (for example using the classification in Fossitt (2000)) may be appropriate in some cases.

Use of the site:

Madders' (2002) methodology, using timed watches from fixed vantage points (VPs), suits well and can be adapted to local circumstances; those aspects of his procedures relevant to Hen Harriers are summarised below. The objective is to estimate the amount of time birds spend foraging per unit area of the site.

Two 3-hour watches per VP per month are recommended for the duration of the breeding season (April – July). A gap of at least one hour between watches is advised.

Restrict observations to 0700-2000 hours and suspend observations during periods of poor visibility and rain.

Select the minimum number of VPs consistent with complete coverage of the site. VPs should be outside the site where feasible, or located so as to avoid disturbance within the site, but within 1 km of the ground being observed. Choose inconspicuous locations, well away from nests, to minimise impact on the birds.

Foraging Harriers usually fly within 10 m of the ground and characteristically change direction and height abruptly when searching for prey. Record duration of observation and activity of any Harriers observed according to habitat category.

Map the area of each habitat visible from each VP, either in the field, from photographs or using a GIS. If there is area overlap from different VPs, observation areas should be summed when calculating overall observation rates/unit area. Because fields of view can change substantially with even minor changes in VP location, exact relocation using a GPS and perhaps an inconspicuous marker on the ground is recommended if more than one observer is involved.

The Report should include a summary of the sections of the site used by foraging Hen Harriers, broken down by broad habitat category.

If successful breeding is demonstrated in or close to a site, then VP observations should be continued into August to identify areas used by recently fledged juveniles prior to dispersal.

References

- Fossitt, J. A. (2000) A Guide to Habitats in Ireland. Heritage Council. Kilkenny.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998) Bird Monitoring Methods – a manual of techniques for key UK species. RSPB, Sandy.
- Madders, M. (2002) Method statement for Vantage Point watches. In: Survey methods to assess windfarm impacts on upland bird communities. Scottish Natural Heritage.
- Norriss, D.W., Marsh, J., McMahon, D. and Oliver, G.A. (2002) A national survey of breeding Hen Harriers *Circus cyaneus* in Ireland 1998-2000. Irish Birds 7: 1-10.

Appendix 8A.4
Breeding Season VP Survey Results (2017 – 2020)

Hen Harrier Observations

Hen Harrier Observations, Breeding Season 2017 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	21.04.17	16.15 - 16.35	5 & 6	1,200	0	Foraging, Commuting	Conifer plantation, scrub, rough grassland, improved grassland	Adult male Hen Harrier flying low (mostly 0-5m above ground level) over trees/scrub. Partly foraging, partly commuting. Flew over conifer plantation, rough grassland & willow scrub, down a river valley with improved agricultural fields and back up the hill where it foraged again. Lost sight behind tall conifers.
2	16.06.17	10.15	6	0	40	Foraging	Heath	Male Hen Harrier hunting over heath-covered section of Dooneens mountain to the east of VP6 (off site). Flight height of 0-5m above ground level.
3	16.06.17	13.08 - 13.09	6	0	90	Commuting, Carrying prey	Heath, Conifer Plantation	Male Hen Harrier (probably the same individual as flightline no. 2) heading south, carrying prey and flying directly. Flight height 5-25m. Flew up over conifer plantation to the south of VP6 and was lost from sight.
4a	16.06.17	16.33	6	0	30	Commuting	Heath	Male Hen Harrier flying south, quickly and directly (no prey). Flight height 5-25m.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
4b	16.06.17	16.40	6	0	40	Flying	Conifer Plantation	Male Hen Harrier (presumed the same individual as flightline no. 4a) gliding slowly through conifer treetops to the south of VP6, c.15m flight height. Lost from sight to the south.
5a	12.07.17	14.14 - 14.20	6	0	360	Flying	Bog, rough grassland	Female Hen Harrier flying in from Laney River Valley 25-100m AGL initially. Mobbed by small passerines. Then gradually ascended higher, circling all the time (well above 100m) and lost from sight in clouds.
5b	12.07.17	14.44 - 14.45	6	0	40	Foraging	Bog, rough grassland	Adult female Hen Harrier (same individual as 5a) flying west across VP6 area. Foraging 0-5m AGL initially and then 5-25m AGL. Mobbed by small passerines. Lost sight as she flew towards the Laney River Valley.
6	23.08.17	13.49	5	70	20	Flying	Improved grassland	Juvenile Hen Harrier (this year's bird) flew southwest and then south at 2-4m height

Hen Harrier Observations, Breeding Season 2018.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	16.03.18	10.11	4	15	0	Foraging	Bog	Brief sighting of ringtail Hen Harrier flying low <5m AGL. Probably foraging. Lost from view due to topography.
2	16.03.18	11.06	3	5	5	Flying	Conifer Plantation, Bog	Male Hen Harrier flew over forest and then over moor at 1-2m AGL. Veered south and flew over hill out of view.
3	22.03.18	12.55 - 12.57	6	0	180	Flying, carrying prey	Bog, Conifer Plantation	Male Hen Harrier carrying food in talons, being mobbed by a Raven (but out-maneuvred it). Continued south with prey flying c. 25-100m AGL.
4	11.04.18	12.47	3	15	17	Flying	Conifer Plantation, Bog	Male Hen Harrier flying over forestry south of VP3 down hill. Flew up over the brow of the hill to the west at 2-10m AGL.
5	10.05.18	10.24 - 10.35	4	660	0	Foraging, Flying	Heath, Conifer Plantation, Rough Grassland	Male Hen Harrier foraging low over heath, conifer plantation & rough grassland habitat c. 5m AGL (15m AGL over trees).

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
6	10.05.18	13.06 - 13.13	1	360	50	Foraging, Consuming Prey	Heath, Conifer Plantation, Rough Grassland	Male Hen Harrier hunting, dropped to ground (point A) for 20 seconds and caught prey (possibly frog) and flew low to point B to consume it. After three minutes he climbed up and soared eastwards, dropping a little and flew southwards along a similar path to observation no. 5 (may be same bird), c. 80m AGL.
7	08.06.18	12.51	4	115	0	Foraging	Rough Grassland, Conifer Plantation	Male Hen Harrier hunting at 0-5m AGL over rough grassland before rising to 25m and flying east over post-thicket forestry.
8	06.07.18	12.07	3	15	5	Foraging	Heath/Bog	Male Hen Harrier hunting over heath bog at a height of 0-5m AGL.
9	06.07.18	12.33 - 12.37	4	210	30	Flying	Grassland, Conifer Plantation	Male Hen Harrier flying over grassland in valley below VP4. Flight height 1-3m AGL over grassland and just above trees in Conifer Plantation.
10a	06.07.18	14.07	3	15	0	Foraging	Heath/Bog	Male Hen Harrier hunting over heath bog at a height of 0-5m AGL.
10b	06.07.18	14.09	3	0	40	Flying	Rough Grassland	Male Hen Harrier (almost certainly same individual as observation no. 10a), flying over rough grassland at 5-25m AGL.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
10c	06.07.18	14.10	3	0	240	Flying (two males together briefly)	Grassland, Conifer Plantation	Male Hen Harrier (from observation no. 10a/b) joined by a second male Hen Harrier and flew together for a few seconds. One bird lost from view. The remaining bird flew over grassland and Conifer Plantation at a height of 5-25m AGL.
11	06.07.18	14.53 - 15.03	2, 6	240	330	Flying with prey	Grassland, Conifer Plantation, Heath	Male Hen Harrier flying with prey, initially c. 10m AGL, circling higher up to 500m north of VP5. Reduced height again to 5-25m AGL to fly along ridge over heath near VP6.

Hen Harrier Observations, Summer Season 2019 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	28.03.19	15.39	6	0	149	Foraging	Heath/Bog	Ringtail Hen Harrier hunting low (1-3m AGL) over heath/bog northeast of VP6.
2	13.05.19	09.20	8	30	0	Flying	Conifer Plantation	Male Hen Harrier flying over forest at a height of 5-25m AGL.
3	12.06.19	12.15	6	0	125	Foraging	Conifer Plantation, Rough Grassland	Male Hen Harrier initially flying at 20m AGL over spruce forestry. Dropped to 1-2m AGL, hunting over rough grassland.
4a	12.06.19	13.20	6	20	0	Commuting	Pasture	Male Hen Harrier flying at a height of 15m AGL over pasture/treelines.
4b	12.06.19	13.22	6	120	0	Foraging	Conifer Plantation, Scrub	Male Hen Harrier hunting at a height of 3-10m AGL. Same individual as 4a.
4c	12.06.19	13.27	6	70	0	Commuting	Conifer Plantation	Male Hen Harrier commuting flight across spruce forestry, then dropped behind it, c. 15m AGL.

Casual Hen Harrier Observations, Summer Season 2019 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
A	27.03.19	11.58	RG TR1	10	0	Flying	Heath/Bog	Male Hen Harrier flying with Buzzard over heather at 10-20m AGL.
B	27.03.19	12.16	RG TR1	10	0	Resting/Flying	Heath/Bog	Male Hen Harrier flushed up from heather during transect. Flew over heather for 10 seconds.
C	27.05.19	08.28	PC1	5	0	Flying	Conifer Plantation	Male Hen Harrier flying over young conifer plantation at a height of 5m AGL.

Hen Harrier Observations, Breeding Season 2020 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	18.03.20	10.28	7 & 3	103	15	Foraging	Conifer Plantation	Male Hen Harrier hunting over bog and pre-thicket forestry at a height of 1-25m.
2	18.03.20	11.26	1	50	0	Foraging	Young Forestry, Scrub, Rush, Grassland	Male Hen Harrier rose out of scrub/new forestry south of VP1, foraged over new forestry and rushy grassland, zig zagging over habitat as it hunted, then flew south towards VP3 over mature forestry, flying low at all times
3	20.03.20	11.36	8	240	0	Foraging	Conifer Plantation, Improved Grassland	Male flying low over spruce forest, then hunting over rushy pasture before circling upwards to 40m height.
4	27.04.20	09.23	6	0	60	Carrying prey	Grassland	Male Hen Harrier carrying prey and flying over grassland at a height of 50-120m above ground level.
5	10.06.20	10.05	4	20	0	Flying	Heath/Bog	Male Hen Harrier flying west at a height of 5-25m.
6	10.06.20	10.49	1	68	0	Flying	Forestry	Adult Male Hen Harrier circling over Forestry at a height of 10-30m.
7a	12.06.20	08.40	5	8	0	Flying	Bog, Rough Grassland	Ringtail Hen Harrier flew east past ridge at VP5 at a height of 10-30m, then flew back west.

Hen Harrier Observations

Hen Harrier Observations, Breeding Season 2017 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	21.04.17	16.15 - 16.35	5 & 6	1,200	0	Foraging, Commuting	Conifer plantation, scrub, rough grassland, improved grassland	Adult male Hen Harrier flying low (mostly 0-5m above ground level) over trees/scrub. Partly foraging, partly commuting. Flew over conifer plantation, rough grassland & willow scrub, down a river valley with improved agricultural fields and back up the hill where it foraged again. Lost sight behind tall conifers.
2	16.06.17	10.15	6	0	40	Foraging	Heath	Male Hen Harrier hunting over heath-covered section of Dooneens mountain to the east of VP6 (off site). Flight height of 0-5m above ground level.
3	16.06.17	13.08 - 13.09	6	0	90	Commuting, Carrying prey	Heath, Conifer Plantation	Male Hen Harrier (probably the same individual as flightline no. 2) heading south, carrying prey and flying directly. Flight height 5-25m. Flew up over conifer plantation to the south of VP6 and was lost from sight.
4a	16.06.17	16.33	6	0	30	Commuting	Heath	Male Hen Harrier flying south, quickly and directly (no prey). Flight height 5-25m.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
4b	16.06.17	16.40	6	0	40	Flying	Conifer Plantation	Male Hen Harrier (presumed the same individual as flightline no. 4a) gliding slowly through conifer treetops to the south of VP6, c.15m flight height. Lost from sight to the south.
5a	12.07.17	14.14 - 14.20	6	0	360	Flying	Bog, rough grassland	Female Hen Harrier flying in from Laney River Valley 25-100m AGL initially. Mobbed by small passerines. Then gradually ascended higher, circling all the time (well above 100m) and lost from sight in clouds.
5b	12.07.17	14.44 - 14.45	6	0	40	Foraging	Bog, rough grassland	Adult female Hen Harrier (same individual as 5a) flying west across VP6 area. Foraging 0-5m AGL initially and then 5-25m AGL. Mobbed by small passerines. Lost sight as she flew towards the Laney River Valley.
6	23.08.17	13.49	5	70	20	Flying	Improved grassland	Juvenile Hen Harrier (this year's bird) flew southwest and then south at 2-4m height

Hen Harrier Observations, Breeding Season 2018.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	16.03.18	10.11	4	15	0	Foraging	Bog	Brief sighting of ringtail Hen Harrier flying low <5m AGL. Probably foraging. Lost from view due to topography.
2	16.03.18	11.06	3	5	5	Flying	Conifer Plantation, Bog	Male Hen Harrier flew over forest and then over moor at 1-2m AGL. Veered south and flew over hill out of view.
3	22.03.18	12.55 - 12.57	6	0	180	Flying, carrying prey	Bog, Conifer Plantation	Male Hen Harrier carrying food in talons, being mobbed by a Raven (but out-maneuvred it). Continued south with prey flying c. 25-100m AGL.
4	11.04.18	12.47	3	15	17	Flying	Conifer Plantation, Bog	Male Hen Harrier flying over forestry south of VP3 down hill. Flew up over the brow of the hill to the west at 2-10m AGL.
5	10.05.18	10.24 - 10.35	4	660	0	Foraging, Flying	Heath, Conifer Plantation, Rough Grassland	Male Hen Harrier foraging low over heath, conifer plantation & rough grassland habitat c. 5m AGL (15m AGL over trees).

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
6	10.05.18	13.06 - 13.13	1	360	50	Foraging, Consuming Prey	Heath, Conifer Plantation, Rough Grassland	Male Hen Harrier hunting, dropped to ground (point A) for 20 seconds and caught prey (possibly frog) and flew low to point B to consume it. After three minutes he climbed up and soared eastwards, dropping a little and flew southwards along a similar path to observation no. 5 (may be same bird), c. 80m AGL.
7	08.06.18	12.51	4	115	0	Foraging	Rough Grassland, Conifer Plantation	Male Hen Harrier hunting at 0-5m AGL over rough grassland before rising to 25m and flying east over post-thicket forestry.
8	06.07.18	12.07	3	15	5	Foraging	Heath/Bog	Male Hen Harrier hunting over heath bog at a height of 0-5m AGL.
9	06.07.18	12.33 - 12.37	4	210	30	Flying	Grassland, Conifer Plantation	Male Hen Harrier flying over grassland in valley below VP4. Flight height 1-3m AGL over grassland and just above trees in Conifer Plantation.
10a	06.07.18	14.07	3	15	0	Foraging	Heath/Bog	Male Hen Harrier hunting over heath bog at a height of 0-5m AGL.
10b	06.07.18	14.09	3	0	40	Flying	Rough Grassland	Male Hen Harrier (almost certainly same individual as observation no. 10a), flying over rough grassland at 5-25m AGL.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
10c	06.07.18	14.10	3	0	240	Flying (two males together briefly)	Grassland, Conifer Plantation	Male Hen Harrier (from observation no. 10a/b) joined by a second male Hen Harrier and flew together for a few seconds. One bird lost from view. The remaining bird flew over grassland and Conifer Plantation at a height of 5-25m AGL.
11	06.07.18	14.53 - 15.03	2, 6	240	330	Flying with prey	Grassland, Conifer Plantation, Heath	Male Hen Harrier flying with prey, initially c. 10m AGL, circling higher up to 500m north of VP5. Reduced height again to 5-25m AGL to fly along ridge over heath near VP6.

Hen Harrier Observations, Summer Season 2019 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	28.03.19	15.39	6	0	149	Foraging	Heath/Bog	Ringtail Hen Harrier hunting low (1-3m AGL) over heath/bog northeast of VP6.
2	13.05.19	09.20	8	30	0	Flying	Conifer Plantation	Male Hen Harrier flying over forest at a height of 5-25m AGL.
3	12.06.19	12.15	6	0	125	Foraging	Conifer Plantation, Rough Grassland	Male Hen Harrier initially flying at 20m AGL over spruce forestry. Dropped to 1-2m AGL, hunting over rough grassland.
4a	12.06.19	13.20	6	20	0	Commuting	Pasture	Male Hen Harrier flying at a height of 15m AGL over pasture/treelines.
4b	12.06.19	13.22	6	120	0	Foraging	Conifer Plantation, Scrub	Male Hen Harrier hunting at a height of 3-10m AGL. Same individual as 4a.
4c	12.06.19	13.27	6	70	0	Commuting	Conifer Plantation	Male Hen Harrier commuting flight across spruce forestry, then dropped behind it, c. 15m AGL.

Casual Hen Harrier Observations, Summer Season 2019 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
A	27.03.19	11.58	RG TR1	10	0	Flying	Heath/Bog	Male Hen Harrier flying with Buzzard over heather at 10-20m AGL.
B	27.03.19	12.16	RG TR1	10	0	Resting/Flying	Heath/Bog	Male Hen Harrier flushed up from heather during transect. Flew over heather for 10 seconds.
C	27.05.19	08.28	PC1	5	0	Flying	Conifer Plantation	Male Hen Harrier flying over young conifer plantation at a height of 5m AGL.

Hen Harrier Observations, Breeding Season 2020 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	18.03.20	10.28	7 & 3	103	15	Foraging	Conifer Plantation	Male Hen Harrier hunting over bog and pre-thicket forestry at a height of 1-25m.
2	18.03.20	11.26	1	50	0	Foraging	Young Forestry, Scrub, Rush, Grassland	Male Hen Harrier rose out of scrub/new forestry south of VP1, foraged over new forestry and rushy grassland, zig zagging over habitat as it hunted, then flew south towards VP3 over mature forestry, flying low at all times
3	20.03.20	11.36	8	240	0	Foraging	Conifer Plantation, Improved Grassland	Male flying low over spruce forest, then hunting over rushy pasture before circling upwards to 40m height.
4	27.04.20	09.23	6	0	60	Carrying prey	Grassland	Male Hen Harrier carrying prey and flying over grassland at a height of 50-120m above ground level.
5	10.06.20	10.05	4	20	0	Flying	Heath/Bog	Male Hen Harrier flying west at a height of 5-25m.
6	10.06.20	10.49	1	68	0	Flying	Forestry	Adult Male Hen Harrier circling over Forestry at a height of 10-30m.
7a	12.06.20	08.40	5	8	0	Flying	Bog, Rough Grassland	Ringtail Hen Harrier flew east past ridge at VP5 at a height of 10-30m, then flew back west.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
7b	12.06.20	08.42	5	10	0	Flying	Bog, Rough Grassland	Ringtail Hen Harrier flying east at a height of 10-30m.
8	16.07.20	12.02	8	5	0	Flying		Brief view of probable male Hen Harrier flying at a height of 5-25m.
9	26.08.20	13.25	8	45	0	Foraging	Heath/Bog	Ringtail Hen Harrier hunting over bog at a height of <20m.
10	26.08.20	13.44	3	5	0	Foraging	Forestry	Ringtail Hen Harrier flying along the edge of forestry at a height of <5m.
11	26.08.20	13.56	8	22	0	Foraging	Heath/Bog	Ringtail Hen Harrier hunting over bog at a height of <20m.
12	26.08.20	14.02	2	65	0	Circling	Heath/Bog	Ringtail Hen Harrier circling at a height of 15-50m, flew towards VP8 where it started hunting at a height of 1-2m.
13	26.08.20	14.08	2 & 5	99	0	Foraging	MF/HB	Ringtail Hen Harrier hunting between VP8 and VP2 flying low 1-2m height.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
7b	12.06.20	08.42	5	10	0	Flying	Bog, Rough Grassland	Ringtail Hen Harrier flying east at a height of 10-30m.
8	16.07.20	12.02	8	5	0	Flying		Brief view of probable male Hen Harrier flying at a height of 5-25m.
9	26.08.20	13.25	8	45	0	Foraging	Heath/Bog	Ringtail Hen Harrier hunting over bog at a height of <20m.
10	26.08.20	13.44	3	5	0	Foraging	Forestry	Ringtail Hen Harrier flying along the edge of forestry at a height of <5m.
11	26.08.20	13.56	8	22	0	Foraging	Heath/Bog	Ringtail Hen Harrier hunting over bog at a height of <20m.
12	26.08.20	14.02	2	65	0	Circling	Heath/Bog	Ringtail Hen Harrier circling at a height of 15-50m, flew towards VP8 where it started hunting at a height of 1-2m.
13	26.08.20	14.08	2 & 5	99	0	Foraging	MF/HB	Ringtail Hen Harrier hunting between VP8 and VP2 flying low 1-2m height.

Golden Plover Observations

Golden Plover Observations, Breeding Season 2018

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
11.04.18	09.55 - 09.56	1	4	75	0	Flying	Bog	Flock of 22 Golden Plover flying low above bog (<5m AGL initially) away from VP4 observer, rose in height to >100m AGL. Considered likely that they were disturbed from roost.
11.04.18	09.56 - 10.46	2	3	0	3,000	Flying, Resting on Bog	Bog	Flock of 22 Golden Plover just off site, heard calling at first. Likely to be the flock from observation no. 1 above. Wide movements and different flight formations. Flight height varying from 5-150m AGL. Landed on bog out of sight at 10.01am. Flew up again at 10.46 and flew quickly downhill to the southeast at 20m AGL

Golden Plover Observations, Summer Season 2019 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
28.03.19	10.23	1	6	0	45	Flying	Heath/bog/scrub & improved grassland	Flock of 18 Golden Plover flying over heath/bog/scrub/improved grassland at a height of 150-170m above ground level (AGL).
28.03.19	13.00	2	4	30	0	Flying	Rough Grassland, Improved Grassland	Flock of 10 Golden Plover flying at a height of 5-25m AGL.
29.03.19	11.00	3	7	600	0	On ground	Heath/Bog	Flock of 25 Golden Plover on the ground
29.03.19	11.05	4	7	300	0	On ground	Heath/Bog	Flock of 3 Golden Plover on the ground
17.04.19	11.31	5	2	3	0	Flying	Heath/Bog	Flock of 15 Golden Plover flying over heath/bog at a height of 80-100m AGL.
17.04.19	13.37	6	2	20	0	Flying	Heath/Bog	Flock of 15 Golden Plover flying over heath/bog at a height of 80-100m AGL.

Golden Plover Observations, Summer Season 2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
18.03.20	8.58	1	4	120	0	Flying		Flock of 40 GP flying at a height of 25-100m.
18.03.20	9.10	2	4	20	0	Flying		Flock of 30 GP flying at a height of 5-25m.
18.03.20	9.29	3	2	45	0	Flying		Flock of 10 GP flew southeast at a height of 80m. Dipped below ridge out of sight.
18.03.20	9.50 - 12.08	4	4	8,280	0	Roosting, Flying		Flock of 54 GP roosting in front of VP4 for a few hours. Some feeding, mostly roosting. Flew off to north at 12.08 at a height of 5-25m.
18.03.20	9.55	5	7	60	0	Flying	Heath/Bog	8 GP flying over bog at a height of <50m.
18.03.20	11.25	6	7	180	60	Flying	Heath/Bog	7 GP flying over bog at a height of 50-150m.
18.03.20	11.48	7	4	10	20	Flying		Flock of at least 200 GP flying - distant observation.
18.03.20	12.40	8	1	4	0	Flying	Forestry	Flock of 20 GP. Very brief appearance before disappearing into cloud. Flying south of VP7 in a southerly direction towards VP4.
18.03.20	12.49	9	7	170	20	Flying	Heath/Bog	Flock of 40 GP flying over bog at a height of 25-200m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
18.03.20	12.54	10	2	30	0	Flying		Flock of 40 GP flying at a height of over 200m.
18.03.20	13.15	11	4	0	120	Flying		Flock of c. 100 GP flying at a height of 25-100m.
18.03.20	14.55	12	1	40	0	Flying	Forestry, Agricultural land, Bog	Flock of 150 GP flying high in four distinct groups which split and merged as they flew. Flew from VP2 over centre of the site in a southerly direction then flew in a south westerly direction before disappearing out of view
18.03.20	15.07	13	1	60	0	Flying	Forestry	Flock of 38 GP flew from the west between VP1 and VP7, flying high, turning and flying in a south/south easterly direction before disappearing out of view.
18.03.20	13.50	14	2	55	0	Flying		Flock of 30 GP flying south/southeast, then circled east of VP1 and then headed east/northeast out of sight.
20.03.20	12.25	15	6	0	60	Flying	Pasture	Flock of 29 GP flying over grassland at a height of 25-100m.

Peregrine Falcon Observations

Peregrine Falcon Observations, Breeding Season 2017 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.06.17	13.06	1	6	0	30	Foraging	Heath and Improved agricultural grassland	Peregrine Falcon hunting over improved agricultural grassland and heath, well off site. Flight height of 5-25m above ground level. Lost from sight over hill to north.
12.07.17	14.10 - 14.12	2	5	150	0	Foraging	Conifer Plantation and Improved agricultural grassland	Peregrine Falcon came into view from the east, hunting high and lazily over conifer plantation. Veered southwest, still hunting over improved grassland and eventually veered off to the southeast. Flight height 25-100m above ground level.
23.08.17	14.52	3	2	22	0	Circling/Flying	Agricultural Grassland	Peregrine Falcon seen circling over fields before flying quickly down the valley. Seen again for two seconds 2 mins later circling over fields.

Peregrine Falcon Observations, Breeding Season 2018

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
08.06.18	14.55 - 15.10	1	1	0	900	Soaring	Rough Grassland, Conifer Plantation	Peregrine Falcon flying to the northeast of VP1. Flight height low at first (20m AGL), mobbed by Swallows. Then circled upwards soaring at 25-100m AGL and finally >100m AGL.

Peregrine Falcon Observations, Summer Season 2019 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
13.05.19	09.59	1	3	0	94	Flying	Heath/Bog	Peregrine Falcon flying north to south from Musheramore western flank over heath/bog. Dropped behind hill out of view. Flying at a height of 40-50m AGL.
21.08.19	10.38	2	1	40	0	Flying	Pasture, Conifer Plantation	Adult Peregrine Falcon flying at a height of 10-20m AGL over pasture. Then skimmed across spruce forest.

Peregrine Falcon Observations, Summer Season 2020 Survey

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
12.06.20	12.51	1	5	6	4	Flying	Bog and Improved Grassland	Peregrine Falcon flew east past VP5 at a height of 20-30m.

Merlin Observations

Merlin Observations, Breeding Season 2019

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.03.18	9.17	1	6	0	28	Perched, Flying	Rough Grassland	Female/immature Merlin perched on Hawthorn for 20 secs, then flew over rough grassland at a height of 20-30m for 8 secs.

Merlin Observations, Breeding Season 2020

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
26.08.20	12.08	1	3	15	0		heath/bog	Merlin flying and interacting with Hooded Crow at a height of 5-25m.

Marsh Harrier Observations

Marsh Harrier Observations, Breeding Season 2019.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
13.05.19	11.55	1	8	120	0	Flying	Heath/Bog	Female Marsh Harrier chased by Hooded Crow. Flying at a height of 5-25m AGL for one minute and 25-100m AGL for one minute.

White-tailed Sea Eagle Observations

White-tailed Sea Eagle Observations, Breeding Season 2020.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
20.03.20	11.17 - 11.26	1	9	420	120	Flying	Heath/Bog & Forestry	<p>Juvenile White-tailed Sea Eagle flew from the east over forestry to the east of VP9, being mobbed by crow, flew in a west/northwesterly direction over bog near VP9, circled over forestry north west of VP9 before turning south and flying over the centre of the site in a south westerly direction circling and flying, circling over the peak of Musheramore, then flying off to the west/south west out of sight. Red tag on eagle's wing, numbers not decipherable, appeared to be juvenile as no distinct white tail apparent. Flight height 40-250m.</p>

Figure 1 Summer 2017 Hen Harrier

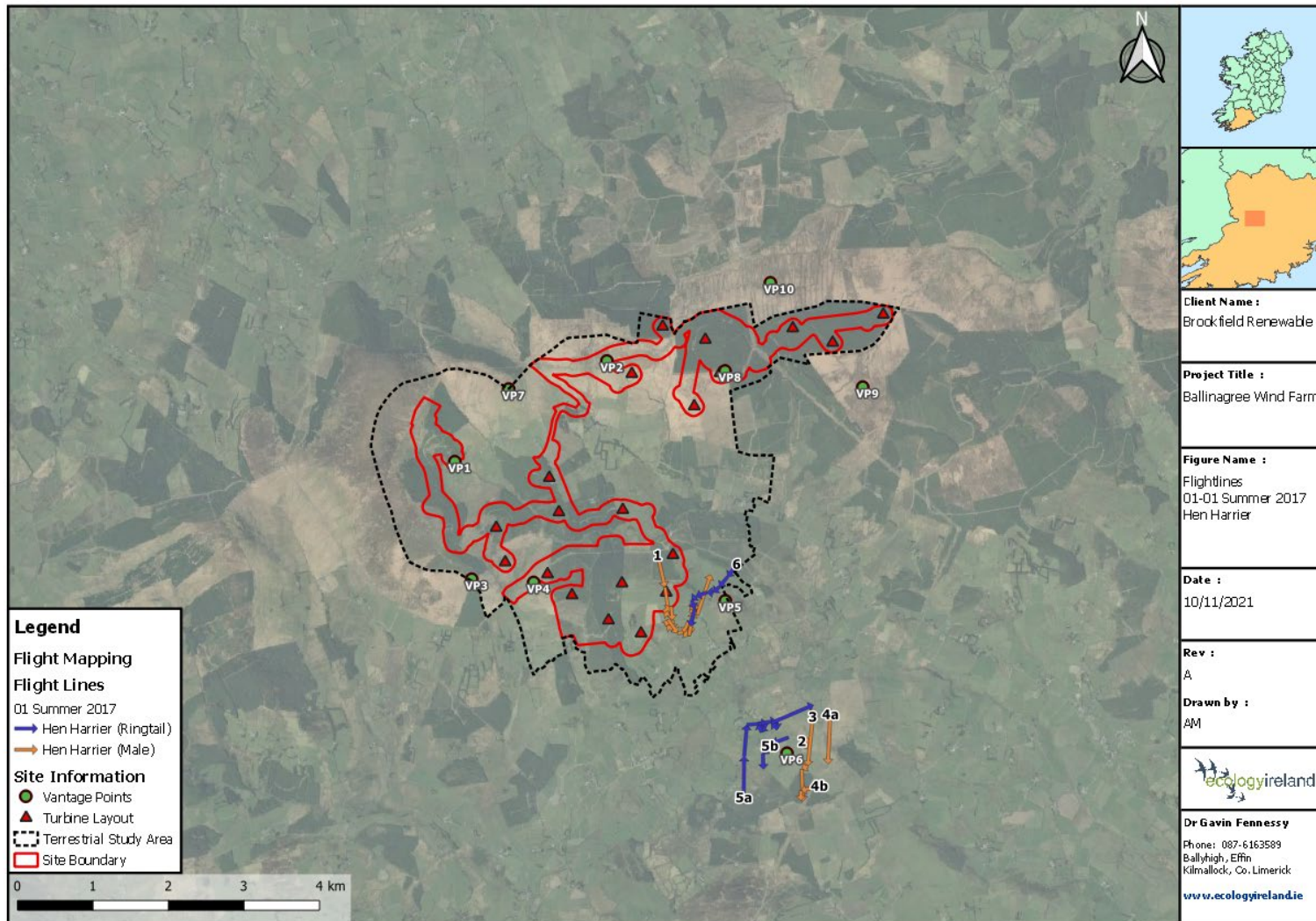


Figure 2 Summer 2017 Peregrine

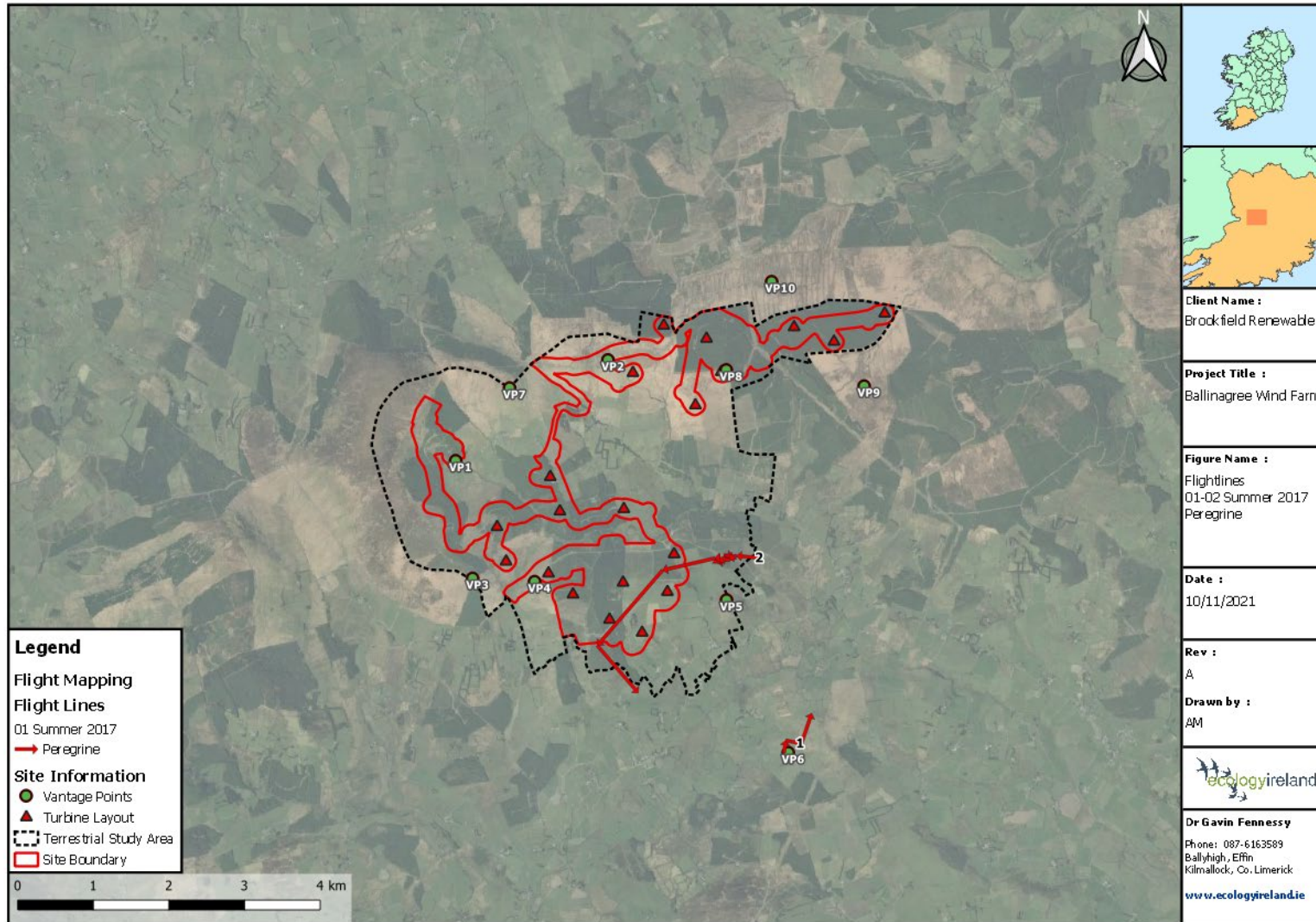


Figure 3 Summer 2018 Golden Plover

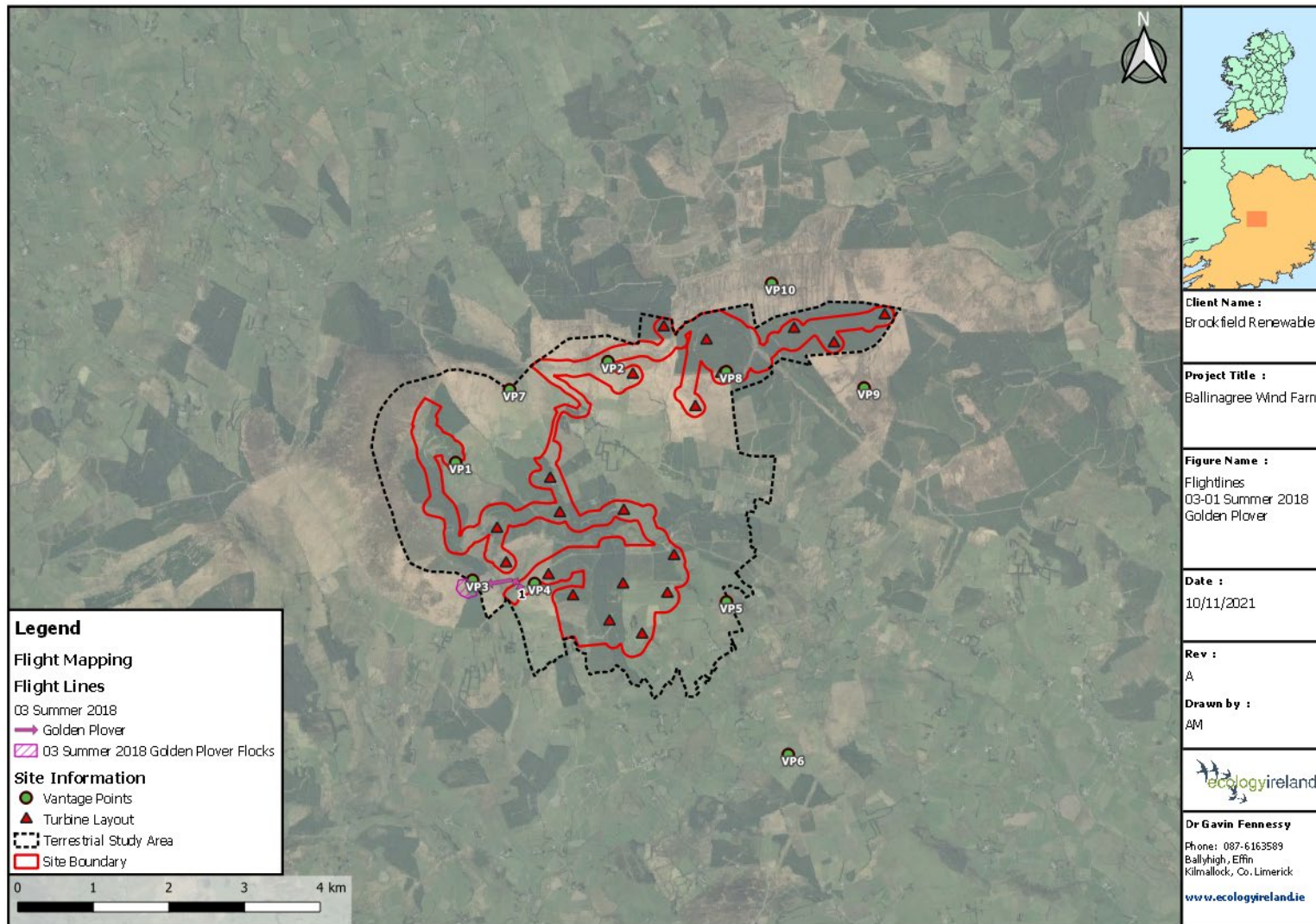


Figure 4 Summer 2018 Hen Harrier

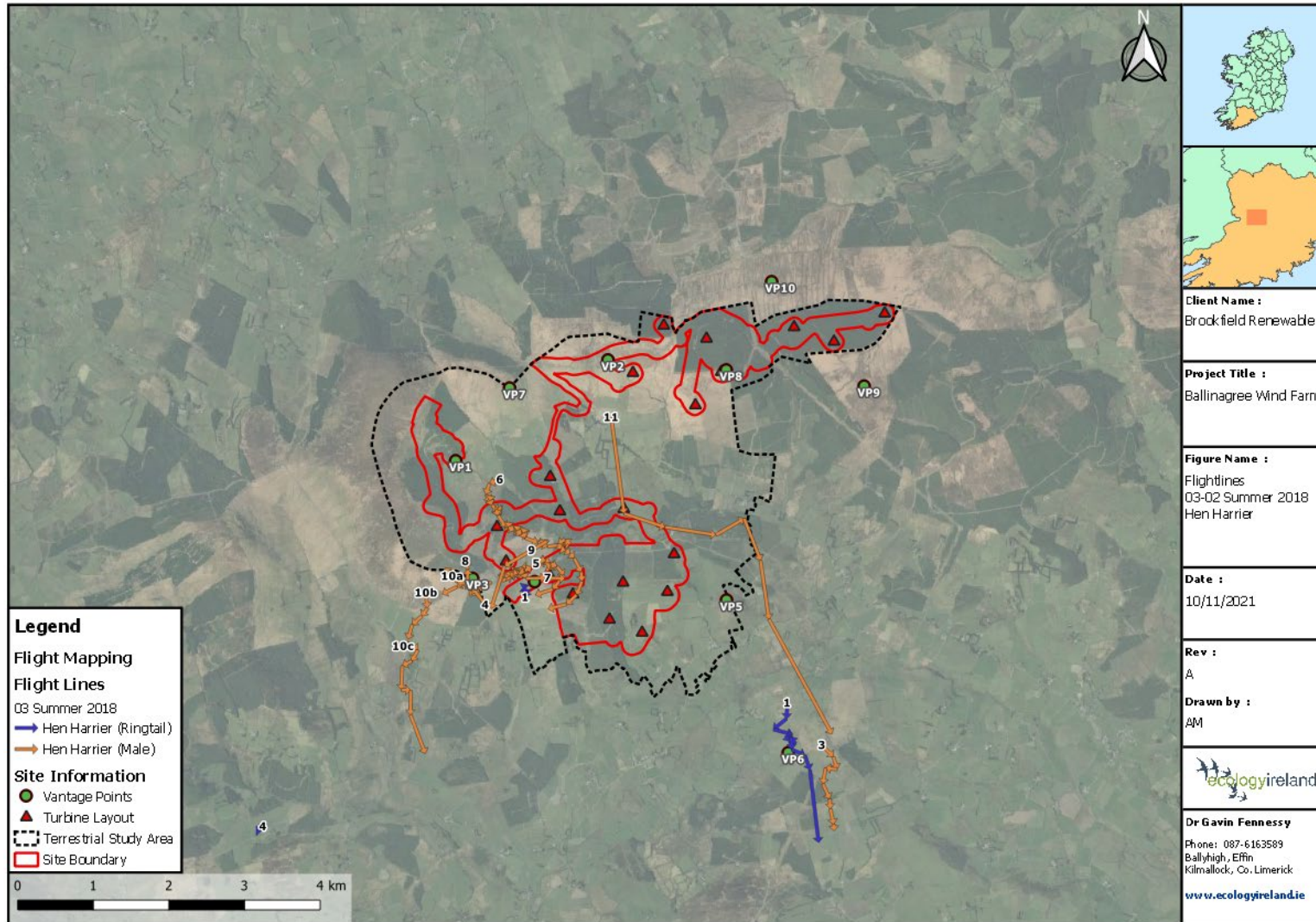


Figure 5 Summer 2018 Peregrine

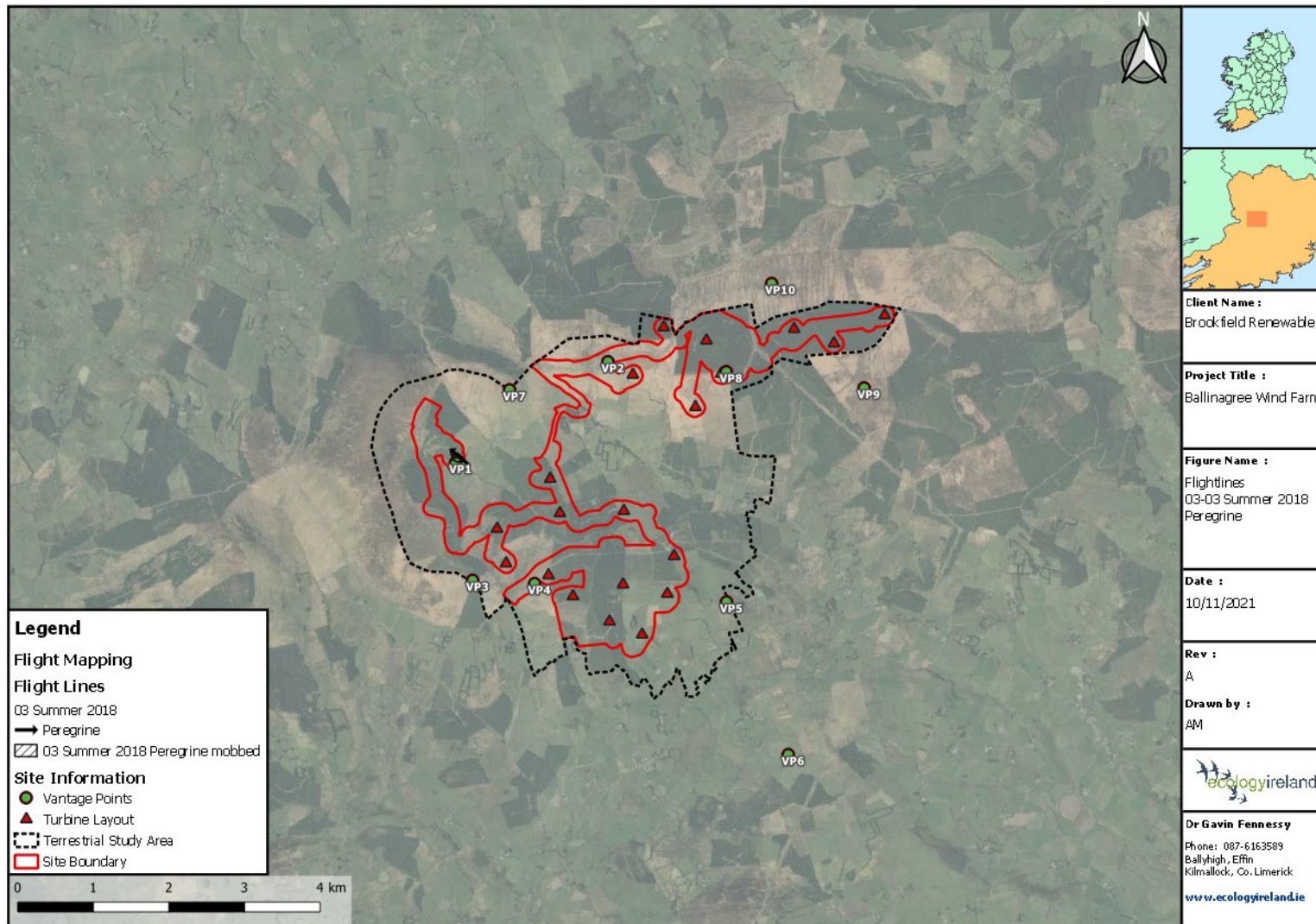


Figure 6 Summer 2018 Kestrel

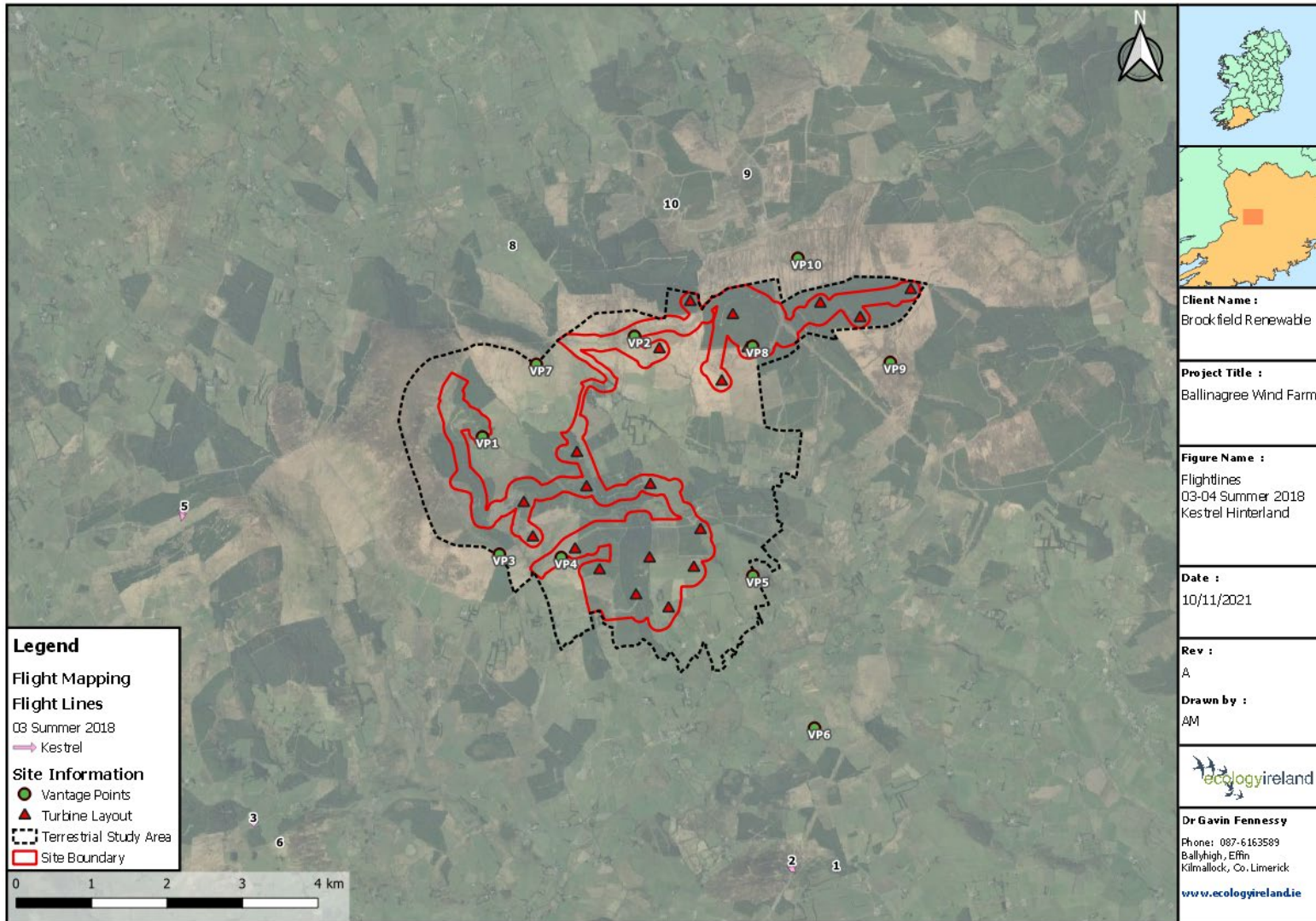


Figure 7 Summer 2019 Golden Plover

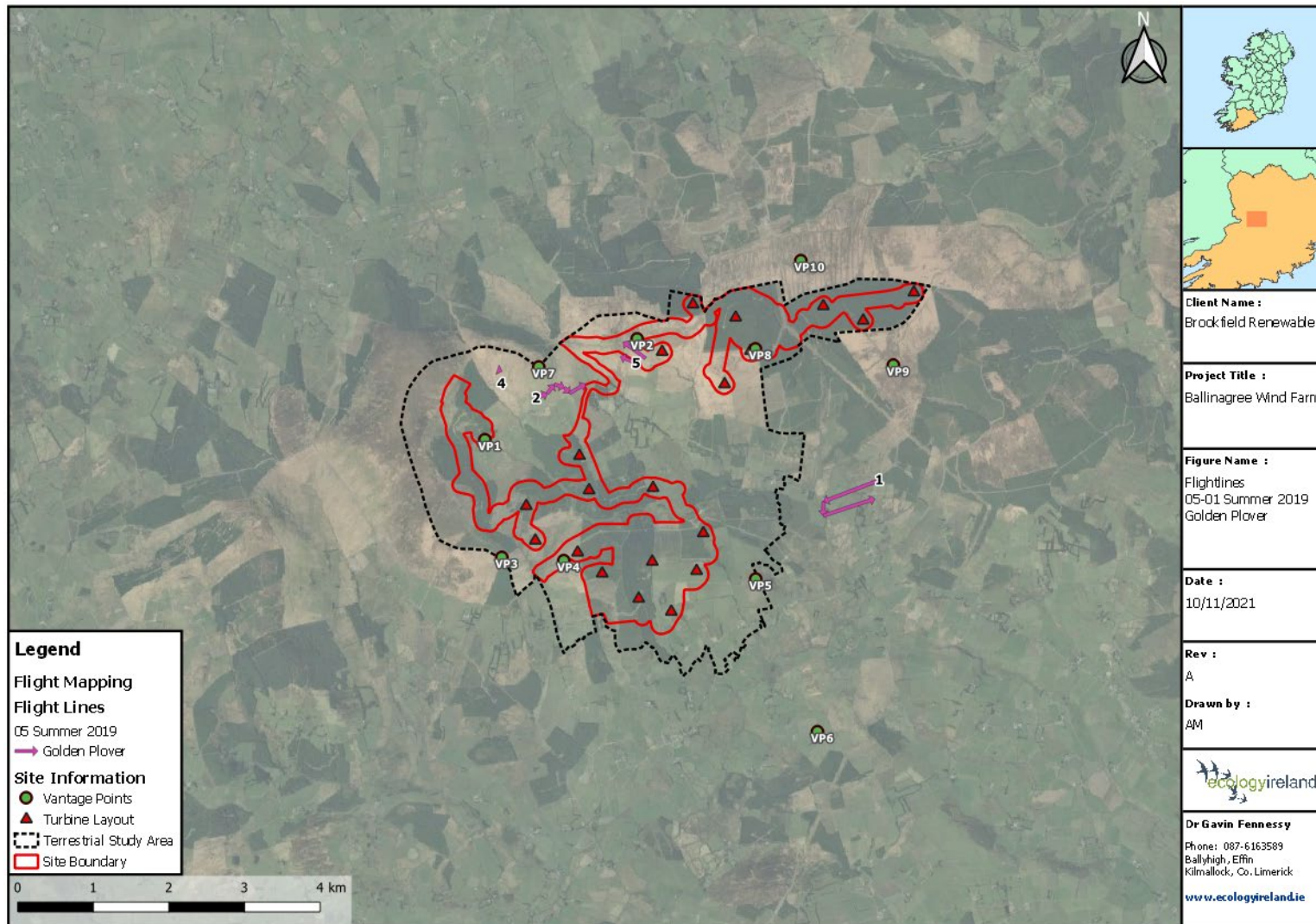


Figure 8 Summer 2019 Hen Harrier

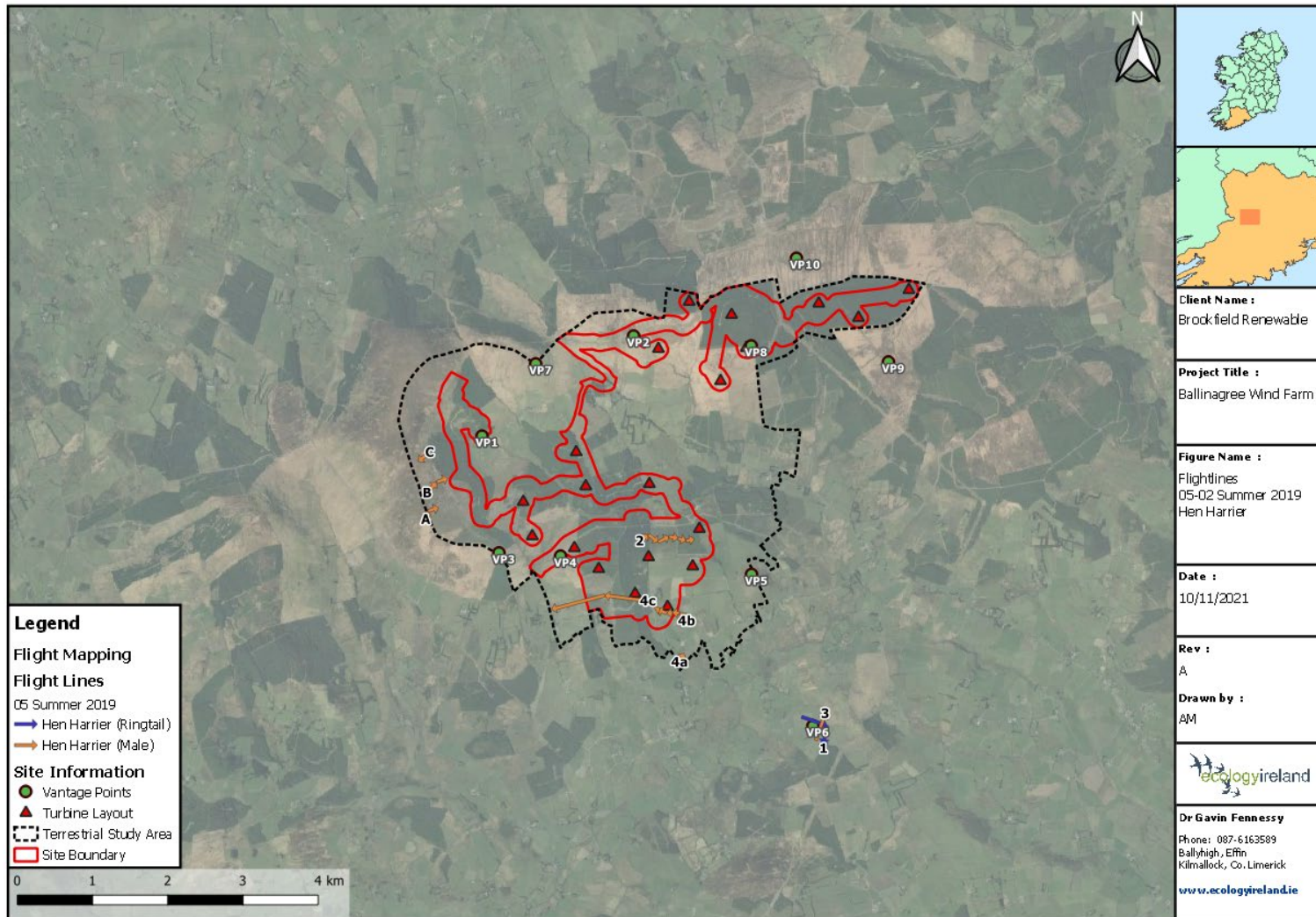


Figure 9 Summer 2019 Peregrine

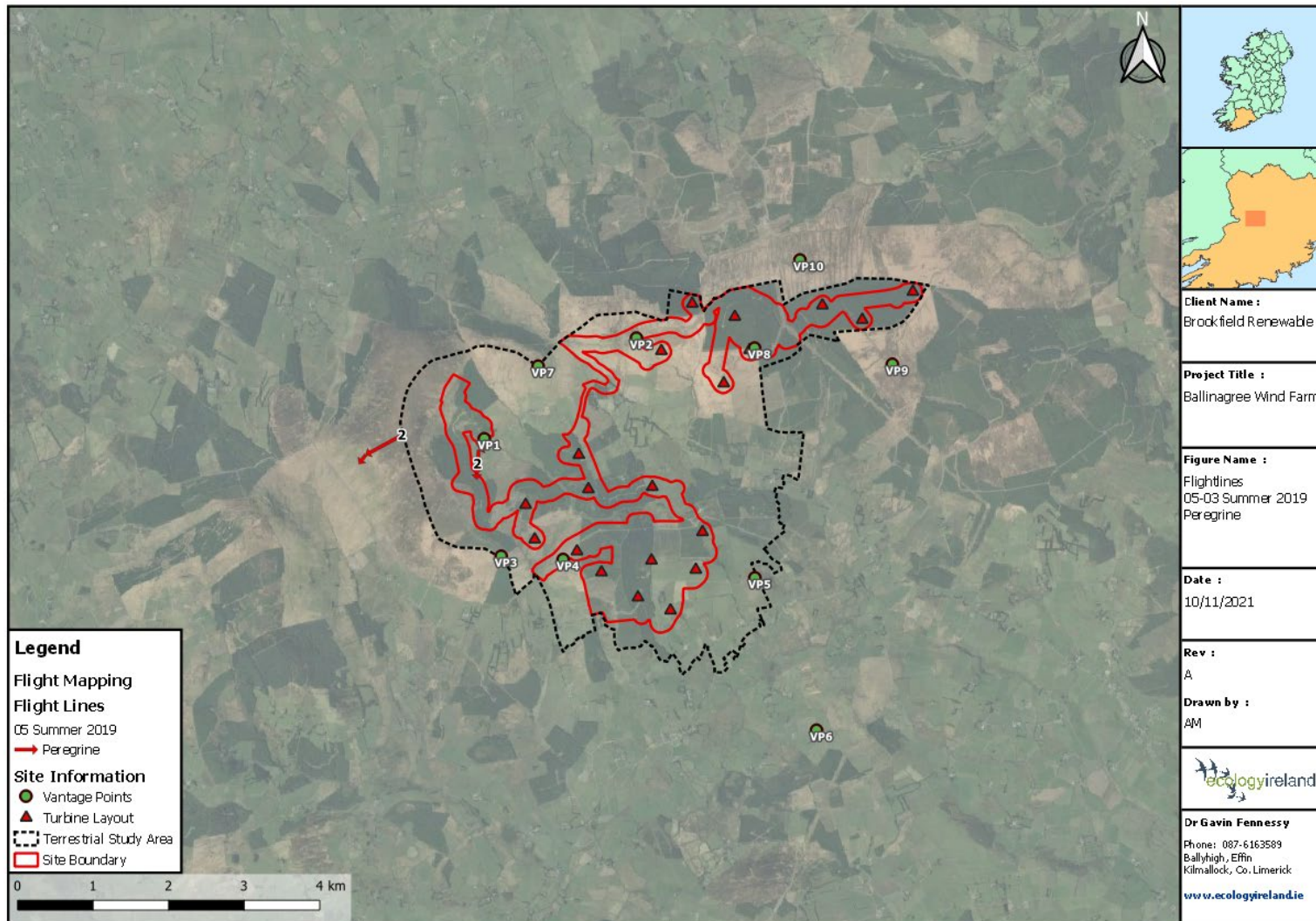


Figure 10 Summer 2019 Marsh Harrier

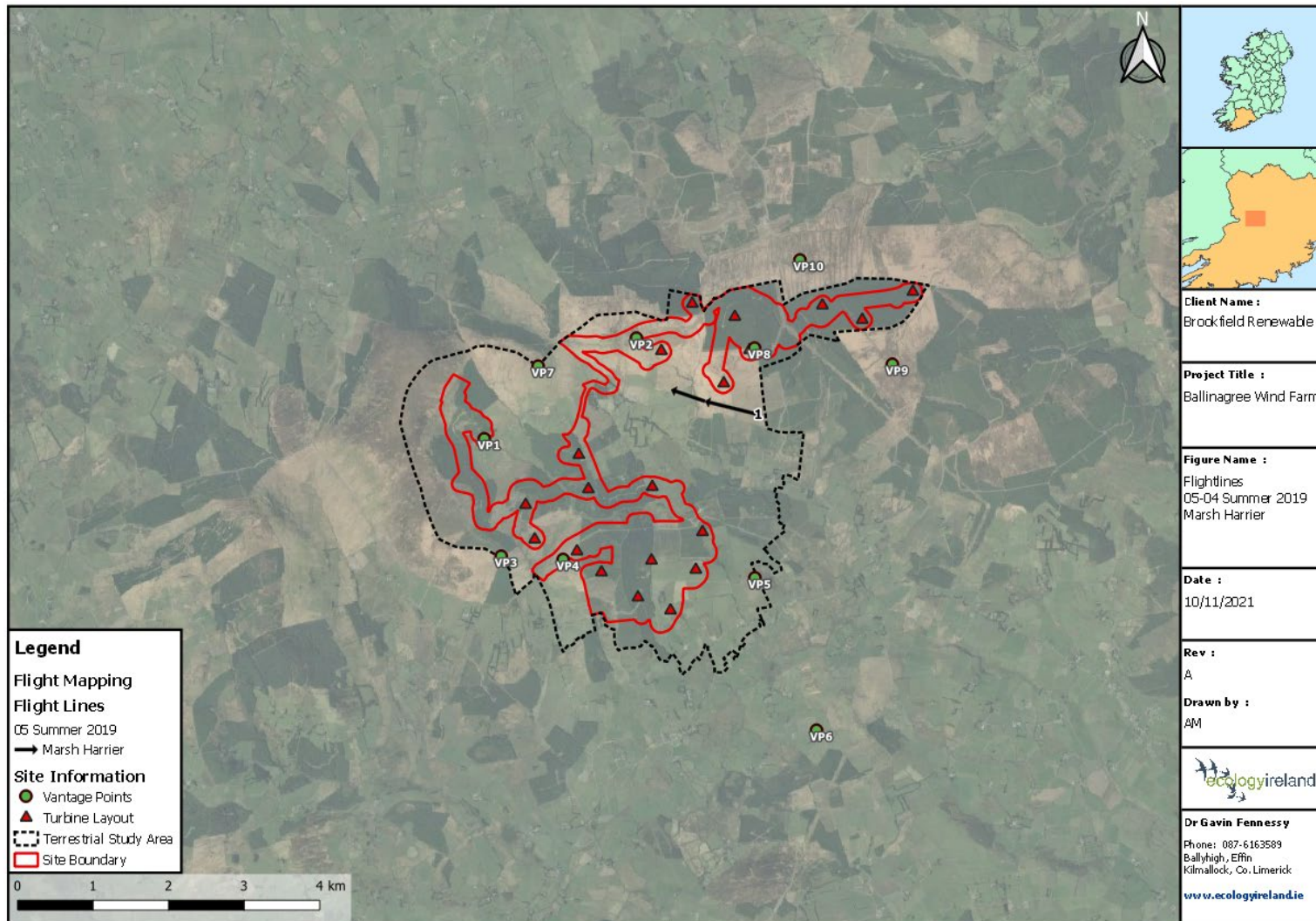


Figure 11 Summer 2019 Red Grouse

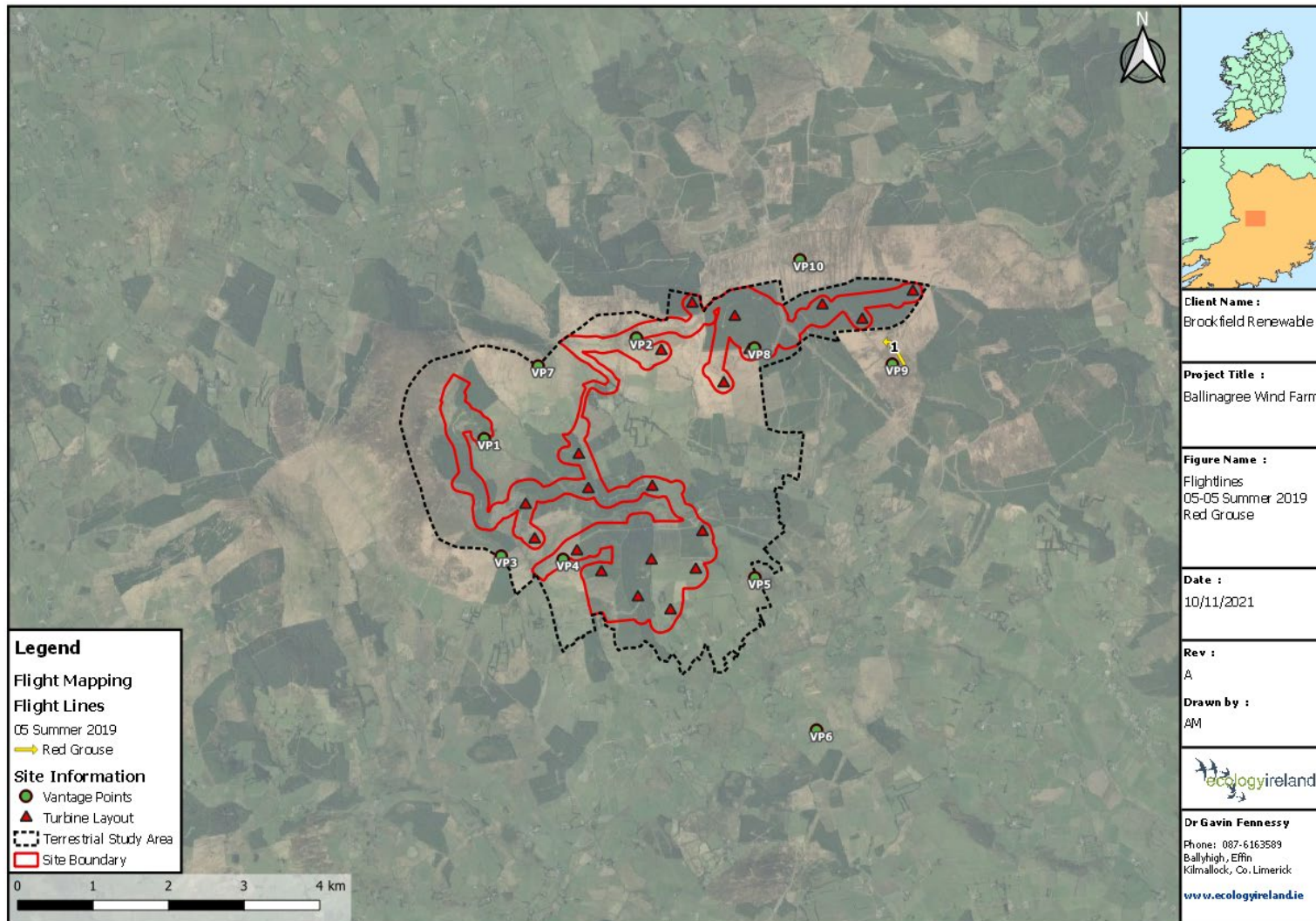


Figure 12 Summer 2020 Hen Harrier

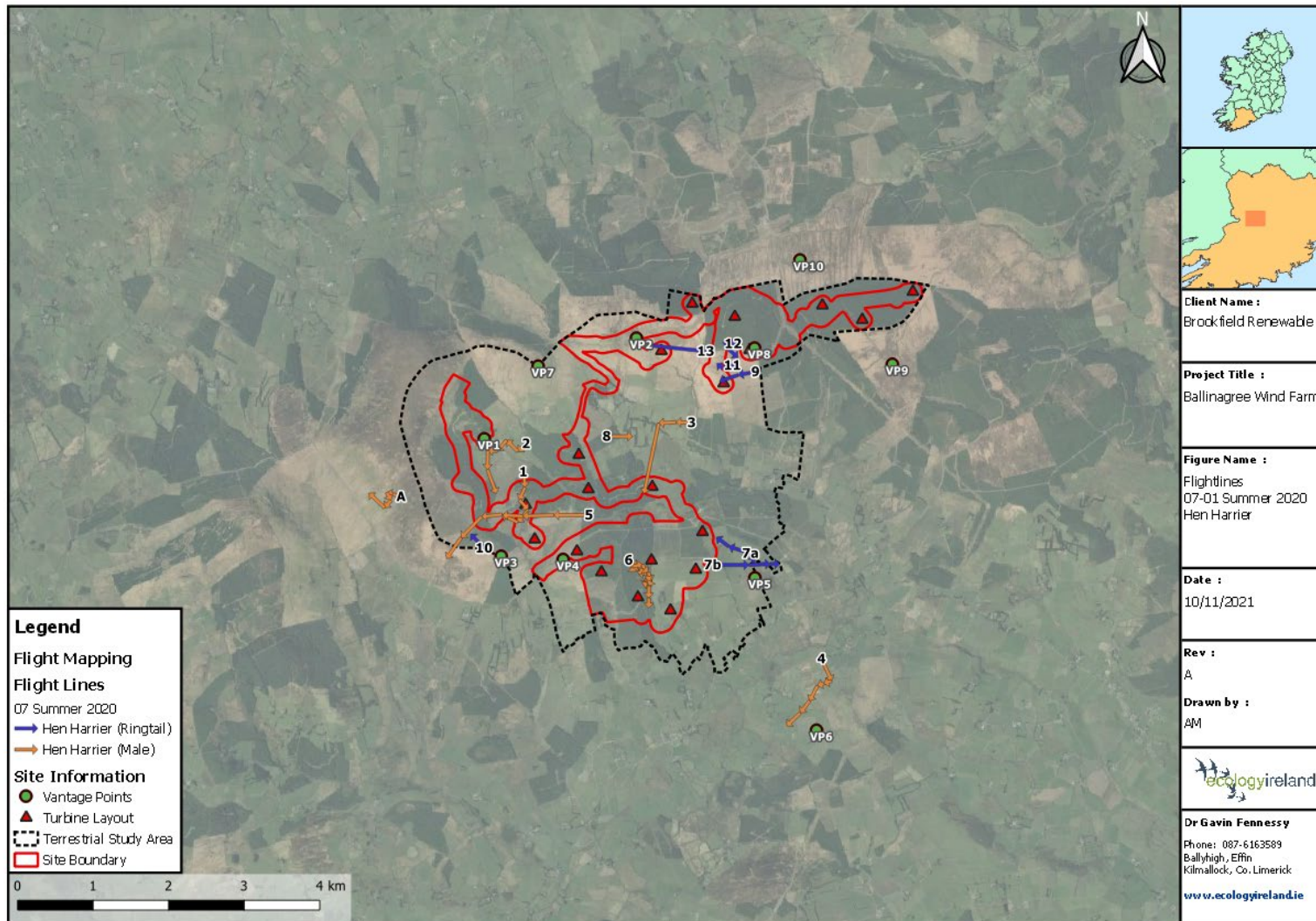


Figure 13 Summer 2020 Peregrine

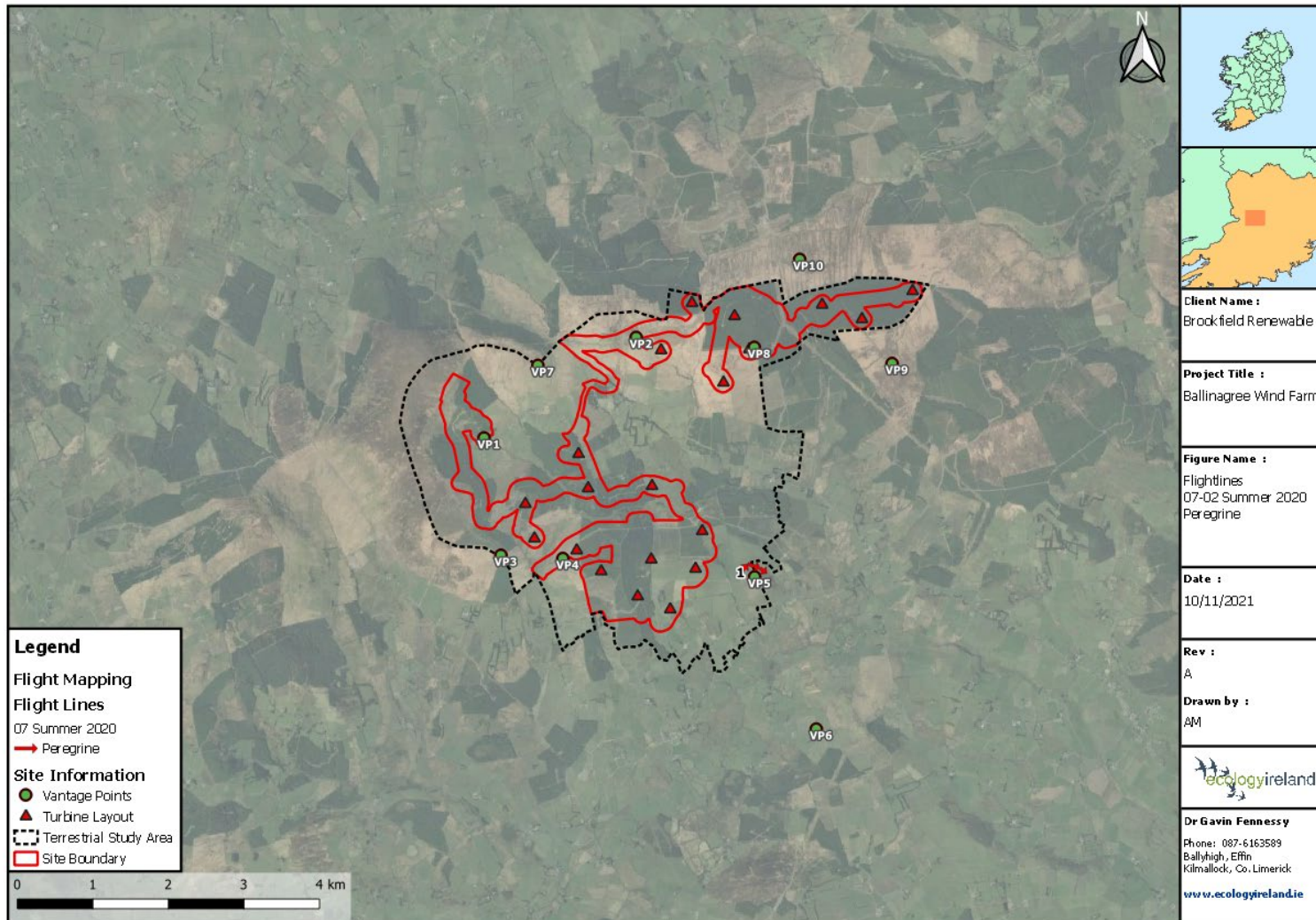


Figure 14 Summer 2020 Merlin

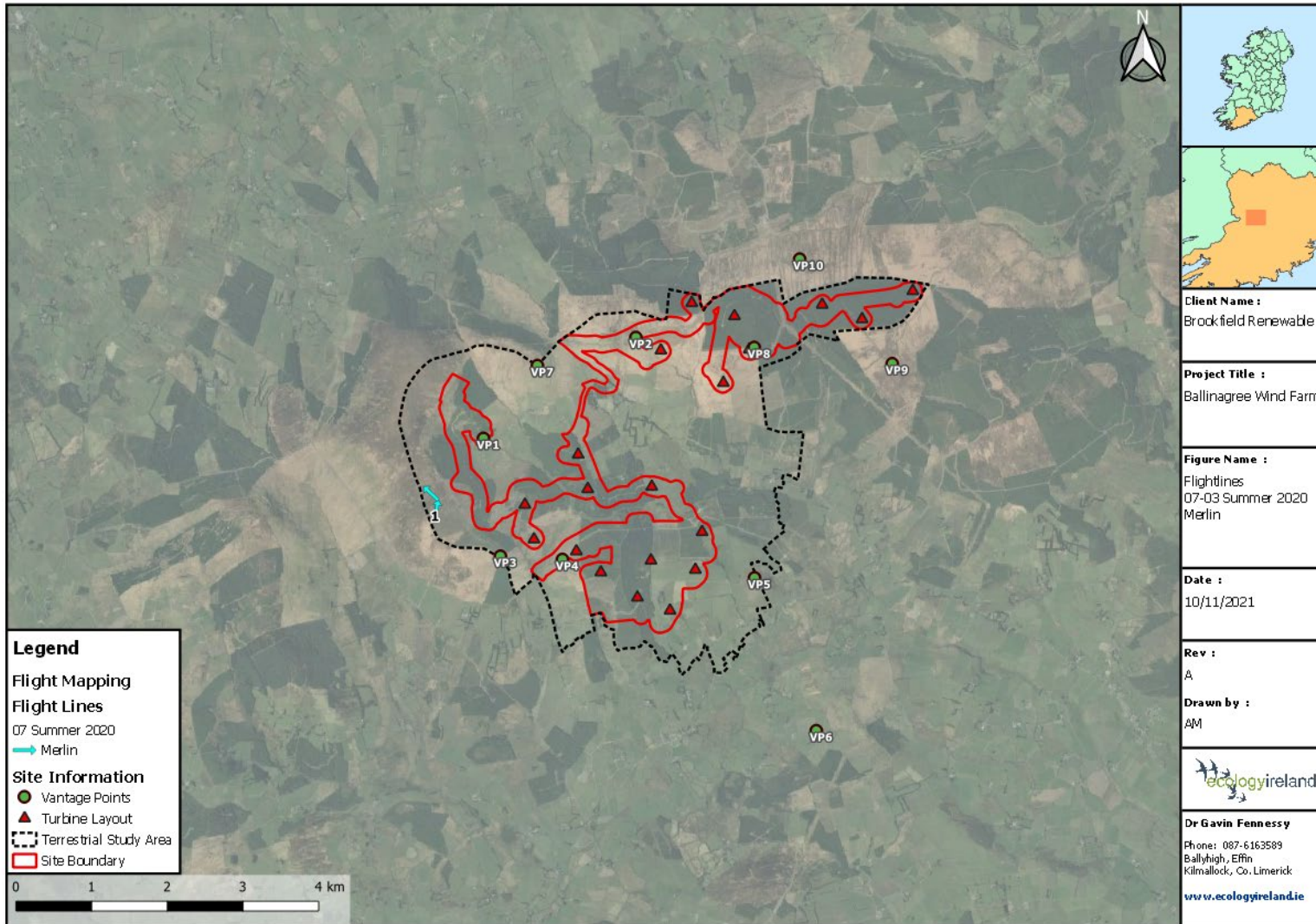


Figure 15 Summer 2020 White Tailed Sea Eagle

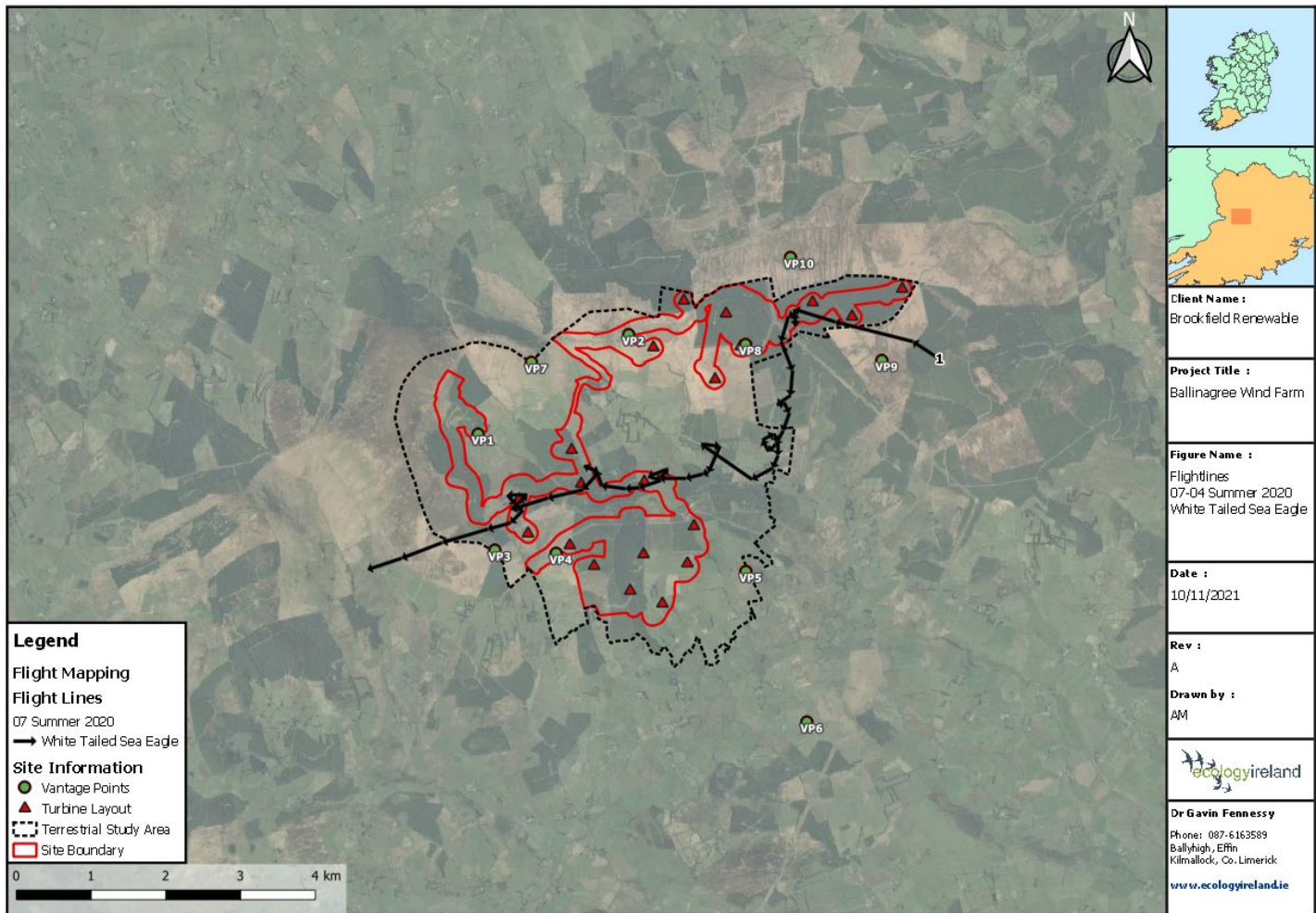


Figure 16 Summer 2020 Red Grouse

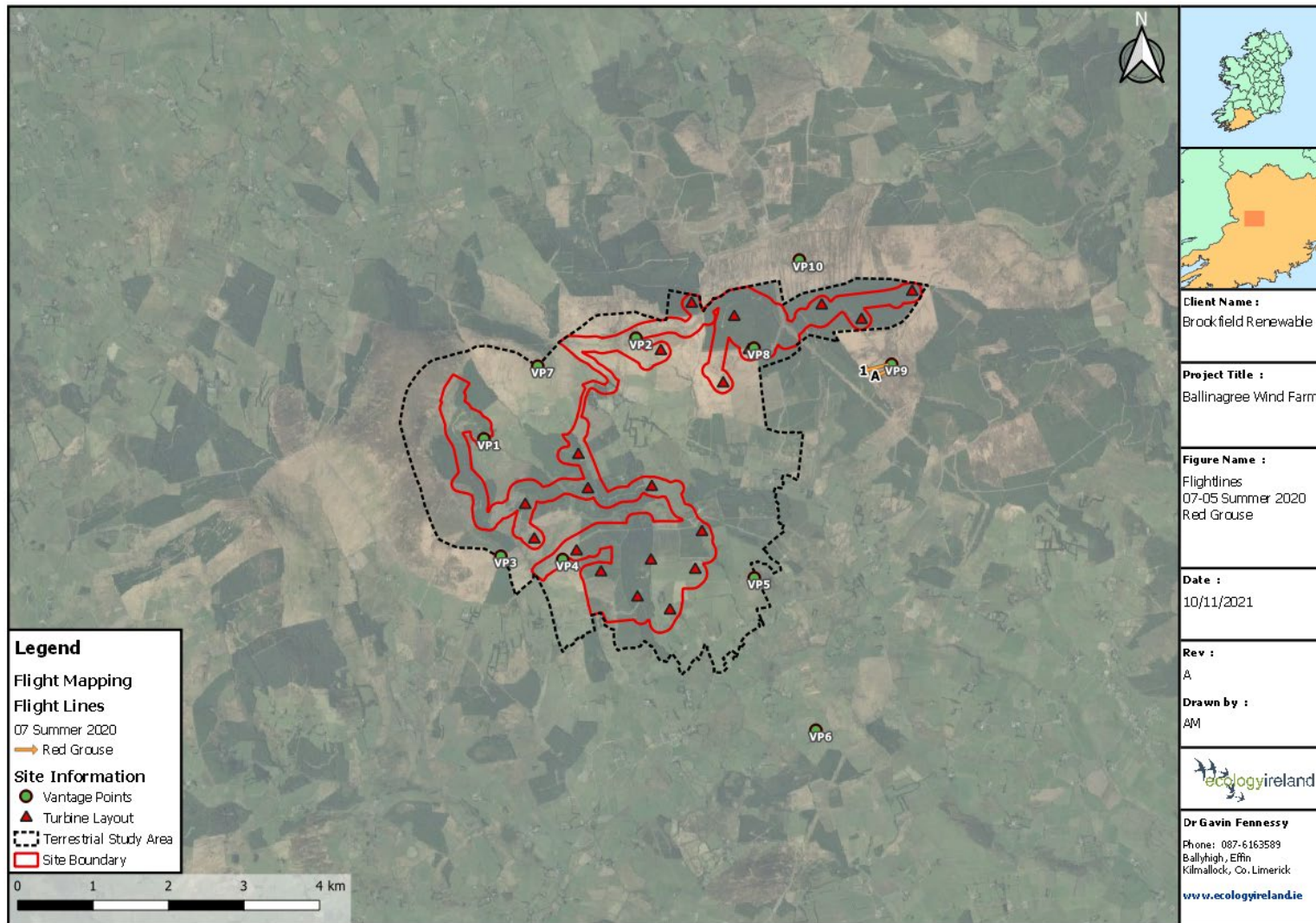
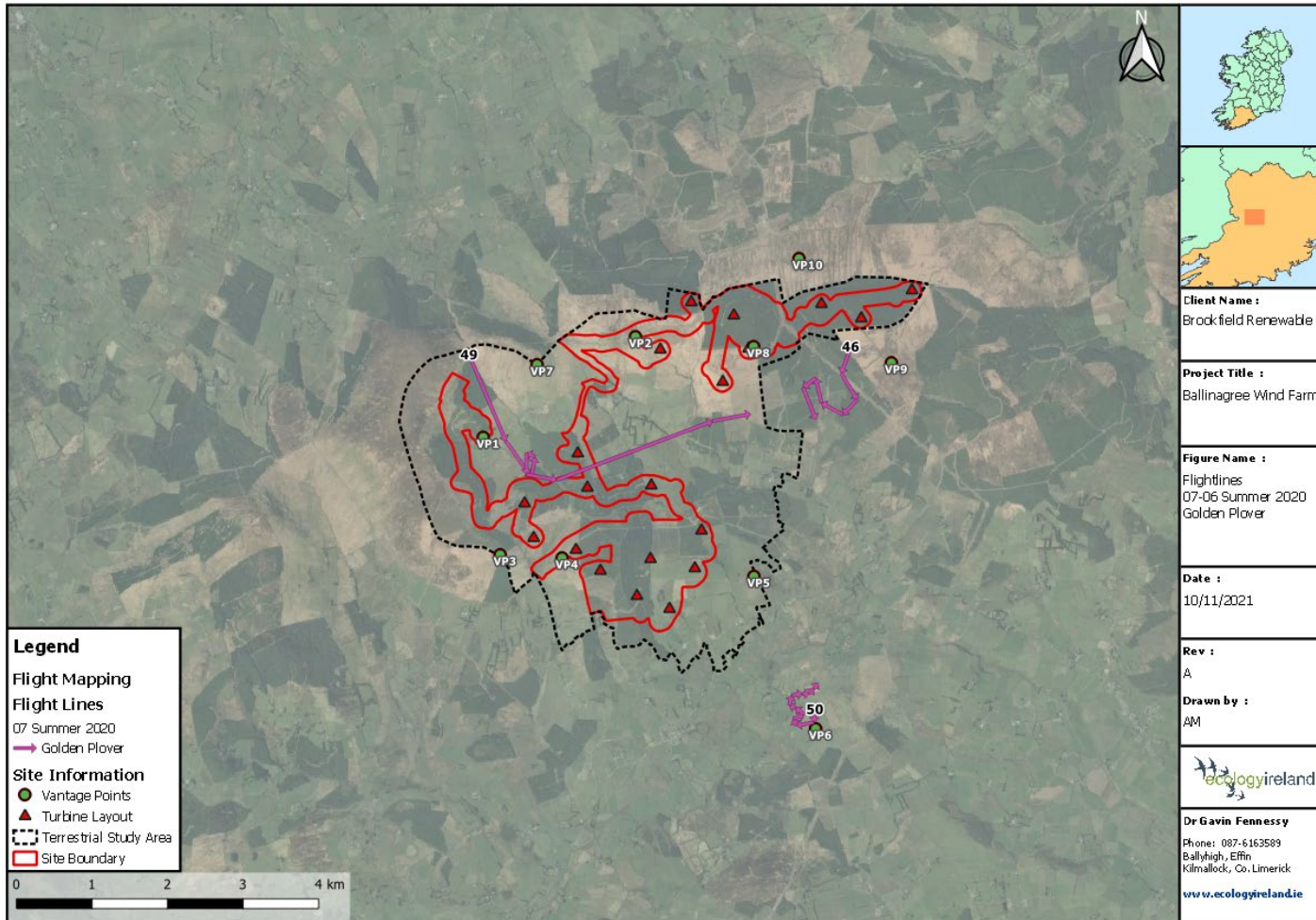


Figure 17 Summer 2020 Golden Plover



Appendix 8A.5

Winter Season VP Survey Results (October 2017 to March 2021)

Hen Harrier Observations

Hen Harrier Observations, Winter Season 2017/2018 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	09.11.17	11.24 - 11.26	5	150	0	Foraging	Conifer Plantation, rough grassland	Male Hen Harrier hunting over young conifers and rough grassland. Flew south at 2-5m above ground level (AGL) and then flew over the forest at 25m AGL, and west out of view.
2	09.11.17	12.45 - 12.47	1 & 5	0	210	Flying	Conifer Plantation	Ringtail Hen Harrier mobbed by three crows. Flying at 25-100m AGL initially, dropped to 20m AGL.
3	09.11.17	13.18	1	4	0	Flying	Conifer Plantation	Adult male Hen Harrier flying just above treetops, 5-25m AGL.
4	09.11.17	13.33	1 & 4	23	161	Foraging	Conifer Plantation, rough grassland	Adult male Hen Harrier foraging, 0-5m AGL, then rose to 20m to clear forestry.
5	26.01.17	12.06 - 12.08	3	120	30	Flying	Conifer Plantation, Bog	Ringtail Hen Harrier (probably a young female) flew in from the east over forest at 8-10m AGL. Mobbed by two Ravens. The Harrier then flew low over the moor (1-2m AGL) as it ascended the hill and flushed two Snipe. It disappeared over the hill but

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
								was seen again flying along the eastern side of the peak to the southeast of Musheramore at 1-2m AGL.
6	21.02.18	13.16	3	4	0	Foraging	Conifer Plantation	Male Hen Harrier came briefly into view over immature conifer plantation to the north of VP3. Flying over conifers at 0-5m AGL. Lost from sight heading north.
7	26.02.18	11.17	5	15	0	Flying	Improved Agricultural Grassland	Adult male Hen Harrier briefly seen, flying quickly over improved agricultural grassland < 25m AGL.
8	26.02.18	11.33 - 11.37	5 & 6	120	120	Flying	Improved Agricultural Grassland, Scrub	Adult male Hen Harrier seen again (probably same bird as Observation 6). Flying quickly improved agricultural grassland, and scrub. Flew around disused house and farmyard at 10m AGL and dropped to 3-5m AGL as it left the site and continued down into valley and over another area of scrub before disappearing out of view.
9	16.03.18	10.11	4	15	0	Foraging	Bog	Brief sighting of ringtail Hen Harrier flying low <5m AGL.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
								Probably foraging. Lost from view due to topography.
10	16.03.18	11.06	3	5	5	Flying	Conifer Plantation, Bog	Male Hen Harrier flew over forest and then over moor at 1-2m AGL. Veered south and flew over hill out of view.
11	22.03.18	12.55	6	0	180	Flying, carrying prey	Bog, Conifer Plantation	Male Hen Harrier carrying food in talons, being mobbed by a Raven (but out-maneuvred it). Continued south with prey flying c. 25-100m AGL.

Hen Harrier Observations, Winter Season 2018/2019 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	17.10.18	9.19 - 9.21	4	135	0	Flying	Rough grass and heath/bog	Male Hen Harrier flying east to west up valley over rough grass and heath/bog. Mobbed by Raven, driven off to southwest over hill.
2	17.10.18	9.38	1	40	0	Foraging	Conifer Plantation	Male Hen Harrier foraging, < 15m above ground level (AGL).
3a	17.10.18	11.24	6	0	49	Foraging	Heath/molinia	Ringtail (probable adult female) foraging low (0-5m AGL) off site over heath.
3b	17.10.18	12.08 - 12.11	6	0	180	Circling	Rough grassland	Ringtail (probable adult female) circling off site off site at a height of 5-25m AGL.
4	17.10.18	12.26	6	0	48	Foraging	Rough Grassland, Conifer Plantation	Ringtail (probable juvenile male) hunting off site over heath at a height of 0-5m AGL.
5	07.12.18	10.23	4	25	0	Foraging	Rough grassland/ Heath bog	Male Hen Harrier foraging low (<5m AGL) for 15 seconds and flying at 5-25m AGL for 10 secs.
6	07.12.18	11.33 - 11.34	6	0	60	Foraging, Flying	Rough Grassland, Conifer Plantation	Female Hen Harrier flying southwest c. 25-30m AGL, foraging and flew over conifer plantation to the south and lost from view.
7a	11.01.19	14.17	3	5	23	Flying	Conifer Plantation	Male Hen Harrier flying east at 20m AGL (over treetops).

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
7b	11.01.19	14.30	2	460	30	Foraging	Conifer Plantation, Rough Grassland, Improved Grassland	Male Hen Harrier hunting low (< 10m AGL)
8	28.03.19	15.39	6	0	149	Foraging	Heath/Bog	Ringtail Hen Harrier hunting low (1-3m AGL) over heath/bog northeast of VP6.

Hen Harrier Observations, Winter Season 2019/2020 Survey.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	22.10.19	13.33	10	0	80	Foraging	Heath/Bog	Male Hen Harrier hunting over heath/bog at a height of <10m above ground level (AGL).
2	22.11.19	11.44	10	0	10	Foraging	Heath/Bog	Male Hen Harrier hunting over heath/bog at a height of <5m above ground level (AGL).
3	17.12.19	9.52	7	15	0	Foraging	Heath/Bog	Male Hen Harrier hunting and flying over bog to west of VP7 at 4-10m above ground level.
4	20.01.20	14.53	5	420	0	Foraging & perching	Conifer Plantation, Improved Grassland	Male Hen Harrier circling at 35m directly above VP5, being mobbed by 3 Hooded Crows. It flew north and descended as it flew and landed on a tree stump for 2 minutes. Then flew over conifer plantation at 20m height and foraged over improved grassland at 2-3m height before flying out of sight.
5	18.03.20	10.28	7 & 3	103	15	Foraging	Conifer Plantation	Male Hen Harrier hunting over bog and pre-thicket forestry at a height of 1-25m.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
6	18.03.20	11.26	1	50	0	Foraging	Young Forestry, Scrub, Rush, Grassland	Male Hen Harrier rose out of scrub/new forestry south of VP1, foraged over new forestry and rushy grassland, zig zagging over habitat as it hunted, then flew south towards VP3 over mature forestry, flying low at all times
7	20.03.20	11.36	8	240	0	Foraging	Conifer Plantation, Improved Grassland	Male flying low over spruce forest, then hunting over rushy pasture before circling upwards to 40m height.

Hen Harrier Observations, Winter Season 2020/2021 Survey

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
1	13.10.20	12.03	10	120	0	Foraging	Forestry/Clearfell	Ringtail Hen Harrier flew from mature forest along margin of young forestry and clearfelled area. Foraging at a height of 5-20m.
2	15.10.20	10.02	2	30	0	Flying	Heath/Bog	Male Hen Harrier interacting with Hooded Crow. Flying at a height of 5-25m.
3	25.11.20	11.00	8	10	0	Foraging	Bog/ Rough Grassland	Male Hen Harrier hunting over bog to the south of VP8 at a height of <10m.
4	25.11.20	11.05	9	0	30	Foraging	Heath/Bog	Male Hen Harrier foraging, disturbed flock of Golden Plover from the ground.
5	25.11.20	11.36	10	0	170	Foraging	Heath/Bog	Male Hen Harrier hunting over bog around VP10 at a height of 1-6m.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
6a	25.11.20	13.05	10	0	161	Flying	Heath/Bog, Forestry	Two male Hen Harriers flying together. One bird flew off to the west.
6b	25.11.20	13.07	10	0	230	Flying, On Ground	Heath/Bog, Forestry	The second male Hen Harrier landed on the ground and remained there for 2 minutes and 5 seconds (x on map) before taking off again and flying north.
7	27.11.20	11.12	3	10	45	Foraging	Heath/Bog	Male Hen Harrier foraging at a height of less than 3m and also perched.
8	10.12.20	12.33	10	4	8	Flying	Heath/Bog, Young Forestry	Male Hen Harrier flying low over new forestry from south. Flew over clear fell and new forest, then along edge of mature forest in an easterly direction. Flying at a height of 10-20m.

Observation	Date	Time	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
9	25.02.21	11.02	2	10	0	Flying	Heath/Bog	Ringtail (female) Hen Harrier flew west over brow of hill at a height of 5-10m.
10	16.03.21	11.35	10	0	68	Foraging, Flying	Heath/Bog	Male Hen Harrier flew from west over bog at 15m height north of VP10, then veered south east and hunting at a height of 5m above ground. Attempted strike twice on Meadow Pipit near stream to east of VP10.
11a&b	30.03.21	11.25	5 & 8	20	60	Flying	Forestry, Rough Grassland	Male Hen Harrier flying at a height of 5-25m.

Golden Plover Observations

Golden Plover Observations, Winter Season 2017/2018.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
24.10.17	12.34	1	4	10	5	Circling	Bog, Rough Grassland	Flock of 8 Golden Plover circling over site briefly from southwest, then lost from view to the southwest again. Flying high, >100m and moving fast.
24.10.17	13.36	2	2	0	8	Flying	Bog	Flock of 8 Golden Plover flew in north-westerly direction. Birds were 15m above bog and in view for 8 seconds.
24.10.17	14.57	3	3	5	10	Flying	Bog, Conifer Plantation	3 Golden Plover flew from behind VP at 15-20m above ground to west towards valley.
09.11.17	10.40	4	1	20	30	Flying	Conifer Plantation, Rough Grassland	Flock of 35 Golden Plover flying c. 25-100m AGL.
09.11.17	11.12	5	3	30	180	Flying	Bog, Conifer Plantation	Flock of 22 Golden Plover flying 5-25m AGL.
09.11.17	11.18 - 11.25	6	3	120	300	Flying	Bog, Conifer Plantation	Flock of 35 Golden Plover flying c. 25-100m AGL. Only visible intermittently as they flew up and down behind brow of hill.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
09.11.17	11.45 - 12.27	7	3	2,350	360	Flying, resting on ground	Bog, Conifer Plantation	Flock of 47 Golden Plover flying 25-100m AGL for c. 15 mins, then flew lower 5-25m and landed on site (see X on map). Stayed on the ground from 11.59 - 12.27 (28 mins).
09.11.17	11.51	8	5	150	0	Flying	Bog, Wet Grassland	Flock of c. 80 Golden Plover flew up and down valley to west of VP5 at 40-60m AGL. Dropped in height to 30m as they flew south and out of view.
09.11.17	12.20 - 12.21	9	2	0	60	Flying	Rough Grassland, Bog	Flock of 26 Golden Plover flew past VP2 heading east, then turned north and flew off brow of hill. Flight height 5-25m AGL.
09.11.17	12.49 - 13.09	10	5	0	1200	Flying	Conifer Plantation, Bog	Flock of c. 200 Golden Plover flying east and west between Musher Mountain and Knockcraugh Mountain at 20-80m AGL. Off site for c. 20 mins.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
09.11.17	14.02	11	1	0	21	Flying	Conifer Plantation, Bog	Flock of 120 Golden Plover flying at 25-100m AGL. Similar sized flock seen >2km northeast (far off site) of this observation at 14.05 (additional time not recorded as so far from site).
26.01.18	11.51 - 11.56	12	3	90	210	Flying	Bog	Flock of 10 Golden Plover flying 2-35m AGL over bog. Circling for 4 mins before landing southwest of VP3 out of sight (but could be heard occasionally).
21.02.18	10.26 - 10.28	13	4	0	117	Flying	?	Flock of 28 Golden plover circling at 5-25m AGL off site.
21.02.18	13.15	14	3	10	0	Flying	Bog	Flock of 8 Golden Plover came into view from the southwest, flying north/northeast over 100m AGL. Lost from view to north of VP3.
21.02.18	13.25	15	1	0	10	Flying	Rough Grassland?	Flock of 8 Golden Plover flying low, <10m AGL.
26.02.18	12.44	16	5	10	15	Flying	Conifer Plantation, Rough Grassland	Flock of 19 Golden Plover flying fast >100m AGL.
26.02.18	12.49	17	5	0	5	Flying	Bog	Flock of 9 Golden Plover flying fast over VP5, 25-100m AGL.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.03.18	12.28	18	3 & 2	40	5	Flying	Conifer Plantation, Bog	Flock of c. 75 Golden Plover flew northeast at 75-100m AGL. Fast direct flight. Lost from sight in low cloud.
16.03.18	13.48	19	2	0	6,120	Flying, resting on ground	Bog, Conifer Plantation, rough grassland?	Flock of c. 150 Golden Plover split from a group of 250 which were visible to the north (far off site) and flew towards the site at 5-10m AGL. Bunching and manoeuvring initially before rapid flight downhill. Landed behind tall conifers near VP2, off site. Stayed on the ground out of sight for the remainder of the watch (i.e. until 15.30).

Golden Plover Observations, Winter Season 2018/2019 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.11.18	10.15	1	3	10	0	Flying	Heath/bog	Golden Plover heard calling over VP. Not seen in fog. On site.
07.12.18	11.10	2	3	10	10	Flying	Heath/bog	Flock of seven Golden Plover flying at a height of 60-80m.
07.12.18	14.00	3	4	0	40	Flying	Conifer Plantation	Flock of c. 20 Golden Plover flushed by Raven and flying at a height of 5-25m AGL.
11.01.19	9.26	4	3	18	4	Flying	Conifer Plantation	Flock of 5 Golden Plover flying c. 20m AGL.
11.01.19	09.40 - 11.20	5	3	0	6,000	Calling	Heath/bog	At least one Golden Plover heard calling at intervals. Not seen, either on the ground or flying.
11.01.19	12.47	6	3	30	0	Flying	Heath/bog	Flock of 40 Golden Plover flying east over heath bog at a height of > 100m.
11.01.19	13.35	7	3	0	36	Flying	Heath/bog	Flock of 26 Golden Plover flying and calling at a height of c. 20m AGL off site.
28.03.19	10.23	8	6	0	45	Flying	Heath/bog/scrub & improved grassland	Flock of 18 Golden Plover flying over heath/bog/scrub/improved grassland at a height of 150-170m AGL.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
28.03.19	13.00	9	4	30	0	Flying	Rough Grassland, Improved Grassland	Flock of 10 Golden Plover flying at a height of 5-25m AGL.
27.03.19	12.05	A	RG TR1	n/a	0	On Ground	Heath/Bog	Flock of 9 Golden Plover flushed from bog during Red Grouse transect RG TR1.

Golden Plover Observations, Winter Season 2019/2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.10.19	11.11	1	10	20	0	Flying	conifer plantation	Flock of 16 Golden Plover flying over conifer plantation at a height of c. 40m above ground level.
22.10.19	11.27	2	10 & 9	0	960	Flying	Heath/Bog	Flock of c. 250 Golden plover flying over heath/bog at a height of 50-100m for 11 minutes and >100m for 5 minutes.
19.11.29	9.46 - 10.31	3	2	1980	780	Circling	Heath/Bog	Flock of 70 Golden Plover took flight and were joined by a flock of 100 from the NE. After 10 mins they were joined by another flock of 100 - giving a total of 270 GP. After another 10 mins a flock of 100 left the group and flew off site to the west. The remaining 170 eventually landed off site to the north.
19.11.29	11.14	4	7	120	0	Flying & landing	Heath/Bog	Flock of 70 Golden Plover flying low (5-25m). Landed on site but not visible on ground.
19.11.29	11.36	5	2	90	30	Flying	Heath/Bog	Flock of 20 Golden Plover flying in a V-formation at a height of >100m.
19.11.29	11.40	6	4	8	0	On ground	Heath/Bog	Flock of 7 Golden Plover on the ground near VP4

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
19.11.29	12.43	7	7 & 2	300	180	Flying	Heath/Bog	Flock of 75 Golden Plover flying at a height of 25-100m, probably landed.
19.11.29	13.08	8	7 & 2	50	120	Flying	Heath/Bog	Flock of 65 Golden Plover flying mainly north of the site, occasionally entering the site. Flying at a height of c. 60m.
22.11.19	11.53	9	8	250	0	Flying	Heath/Bog	Flock of 21 Golden Plover calling and flying at a height of 30-40m above ground level.
22.11.19	11.57	10	8	251	0	Flying	Heath/Bog	Flock of 14 Golden Plover flying low over bog and calling.
22.11.19	12.10	11	8	3076	0	On ground	Heath/Bog	Flock of 15 Golden Plover landed on heath/bog southwest of VP8. Later took off up into cloud/fog and lost from sight.
22.11.19	12.40	12a	9	0	50	Flying	Heath/Bog	Flock of 12 Golden Plover flying over heather bog at a height of 10-25m above ground level.
22.11.19	12.42	12b	9	0	15	Flying	Heath/Bog	Flock of 12 Golden Plover (same as 12a) flying over heather bog at a height of 10-25m above ground level.
22.11.19	12.55	13	10	0	5	Flying	Heath/Bog	Golden Plover heard in flight off site near VP10 but not seen.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.11.19	13.49	14a	6	0	30	Flying	Heath/Bog	Flock of 200 GP flying at a height of over 200m over VP5.
22.11.19	13.49	14b	6	0	45	Flying	Heath/Bog	A group of 75 split off from the main flock and flew north east.
22.11.19	13.54	15	5	16	0	Flying	Rough grassland, Improved grassland	Flock of 15 Golden Plover flying at a height of 80m above ground level.
16.12.19	10.12	16a	9	0	900	Flying, On Ground	Heath/Bog	Flock of 130 Golden Plover arrived from ENE, circled over bog at a height of 25-100m. Group of 25 dropped on to bog.
16.12.19	10.27	16b	9	25	755	Flying	Heath/Bog	Flock of 160 Golden Plover joined the original flock and continued circling ascending to c. 400m.
16.12.19	11.02	17	9	0	40	Flying	Heath/Bog	Flock of 23 Golden Plover appear to have just taken off from bog.
16.12.19	11.05	18	9	30	620	Flying	Heath/Bog	Flock of 23 Golden Plover flying at a height of 40-150m.
16.12.19	11.15	19	9	0	35	Flying		Flock of 7 Golden Plover circling initially at a height of 30m.
16.12.19	11.16	20	9	45	240	Flying	conifer plantation	Flock of 16 Golden Plover flying at a height of 40-125m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.12.19	11.20	21	9	10	480	Flying	conifer plantation	Flock of 20 Golden Plover join the 16 from flightline 19 and circle near VP10 at a height of 50-100m.
16.12.19	11.25	22	8	0	5	Flying	Bog and Forestry	Two groups of 6 GP flew behind VP9 over Knockduff turbines in a North East Direction. Flying high (150m).
16.12.19	13.57	23	9	0	150	Flying	conifer plantation	Flock of 3 GP took off from bog north of VP 9.
17.12.19	9.35	24	4	10	0	Flying	Heath/bog/conifer plantation	One Golden Plover flying low (0-5m).
17.12.19	9.52	25	7	12	0	Flying	Heath/Bog	Two GP flying at 10-20m above ground level - probably flushed by Hen Harrier.
20.01.20	10.24	26	2	20	0	Flying		One GP flying - lost from view against sun.
21.01.20	9.37	27	7	45	0	Flying	Heath/Bog & Forestry	Flock of 4 GP flying over heather bog and forestry at a height of 25-100m.
21.01.20	11.40	28	3	0	375	Flying, On Ground	Heath/Bog, rough grassland	Flock of 30 GP on ground for 5 minutes and inflight at a height of <150m for 75 secs.
21.01.20	13.14	29	7	10	0	Flying	Heath/Bog	Flock of c. 50 GP flying over bog at a height of 80m.
20.02.20	9.40	30	7	10	0	Flying	Heath/Bog	3 GP flying over heath/bog at a height of 20m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
20.02.20	9.57	31	7	0	45	Flying	Heath/Bog	5 GP flying over heath/bog at a height of 10-15m.
20.02.20	10.15	32a	7	15	0	Flying	Heath/Bog	6 GP flying over heath/bog at a height of 10-20m. Lost from sight in cloud.
20.02.20	10.18	32b	7	14	0	Flying	Heath/Bog	6 GP flying low (1-2m height) over heath/bog.
20.02.20	10.25	33	8	0	12	Flying	Heath/Bog	Flock of 60 GP flying at a height of 50m off site.
20.02.20	10.54	34	7	200	31	Flying	Heath/Bog	Flock of 92 GP flying around VP7 and off to the NE at a height of 40-100m.
20.02.20	11.20	35	2	0	20	Flying	Heath/Bog and Forestry	Flock of 50 GP Circling and flying to the north of VP2 before disappearing behind the hill behind VP2.
18.03.20	8.58	36	4	120	0	Flying	Heath/Bog	Flock of 40 GP flying at a height of 25-100m.
18.03.20	9.10	37	4	20	0	Flying	Heath/Bog, rough grassland	Flock of 30 GP flying at a height of 5-25m.
18.03.20	9.29	38	2	45	0	Flying	Heath/Bog	Flock of 10 GP flew southeast at a height of 80m. Dipped below ridge out of sight.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
18.03.20	9.50 - 12.08	39	4	8,280	0	Roosting, Flying	Conifer Plantation, grassland	Flock of 54 GP roosting in front of VP4 for a few hours. Some feeding, mostly roosting. Flew off to north at 12.08 at a height of 5-25m.
18.03.20	9.55	40	7	60	0	Flying	Heath/Bog	8 GP flying over bog at a height of <50m.
18.03.20	11.25	41	7	180	60	Flying	Heath/Bog	7 GP flying over bog at a height of 50-150m.
18.03.20	11.48	42	4	10	20	Flying	Heath/Bog, Conifer Plantation	Flock of at least 200 GP flying - distant observation.
18.03.20	12.40	43	1	4	0	Flying	Forestry	Flock of 20 GP. Very brief appearance before disappearing into cloud. Flying south of VP7 in a southerly direction towards VP4.
18.03.20	12.49	44	7	170	20	Flying	Heath/Bog	Flock of 40 GP flying over bog at a height of 25-200m.
18.03.20	12.54	45	2	30	0	Flying	Conifer Plantation, grassland	Flock of 40 GP flying at a height of over 200m.
18.03.20	13.15	46	4	0	120	Flying	Conifer Plantation, grassland	Flock of c. 100 GP flying at a height of 25-100m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
18.03.20	14.55	47	1	40	0	Flying	Forestry, Agricultural land, Bog	Flock of 150 GP flying high in four distinct groups which split and merged as they flew. Flew from VP2 over centre of the site in a southerly direction then flew in a south westerly direction before disappearing out of view
18.03.20	15.07	48	1	60	0	Flying	Forestry	Flock of 38 GP flew from the west between VP1 and VP7, flying high, turning and flying in a south/south easterly direction before disappearing out of view.
18.03.20	13.50	49	2	55	0	Flying		Flock of 30 GP flying south/southeast, then circled east of VP1 and then headed east/northeast out of sight.
20.03.20	12.25	50	6	0	60	Flying	Pasture	Flock of 29 GP flying over grassland at a height of 25-100m.

Golden Plover Observations, Winter Season 2020/2021 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
13.10.20	9.27	1	10	2	3	Flying	Heath/bog/conifer plantation	Flock of 5 Golden Plover flying at a height of 20-30m (dipped low out of clouds).
13.10.20	12.11	2	5	20	0	Flying		Flock of 50 Golden Plover flying at a height of 15 to 100m.
15.10.20	9.00	3	2	5	0	Flying		One bird heard but not seen.
15.10.20	10.33	4	7	8	2	Flying	Heath/Bog	Flock of 4 GP flew towards VP7 from the west and turned north at a height of 5m. Heard again west of VP.
15.10.20	13.01	5	4	51	0	Flying	Heath/Bog	Flock of 26 GP flying over VP and off to the south at a height of 40-50m.
15.10.20	13.10	6	2	60	0	Flying	Heath/Bog	Flock of 11 GP flying at a height of 5-25m.
15.10.20	13.17	7	7	12	8	Flying	Heath/Bog	Flock of 9 GP flying north at a height of 15m.
15.10.20	14.06	8	2	120	0	Flying	Heath/Bog	Flock of 6 GP flying at a height of 5-25m.
25.11.20	9.00	9	9	180	0	Flying	Heath/Bog	Flock of 30 GP flying low (<25m), may have landed.
25.11.20	9.31	10	10	0	1,241	Flying	Forestry. Bog, Improved	Flock of c. 400 GP flying NE of VP10 at a height of 80-150m over existing wind farm to the north.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
							Grassland and Rough Grassland	
25.11.20	9.40	11	10	0	20	Flying	Heath/Bog	Flock of 14 GP flying over VP 10 at a height of 10-30m.
25.11.20	9.42	12	2	50	0	Commuting	Heath/Bog	Flock of 11 GP flying at a height of 60-150m.
25.11.20	10.21	13	8	0	10	Flying	Heath/Bog	Flock of 8 GP flying at a height of 100m to the east of VP8.
25.11.20	10.23	14	10	0	137	Flying	Heath/Bog, Forestry	Flock of 15 GP flying near substation to the NW of VP 10 at a height of 10-30m.
25.11.20	10.25	15	9	0	10	Flying	Forestry	One GP Flying at a height of 5-25m.
25.11.20	10.37	16	6	0	60	Flying	Grassland	Flock of 25 GP flying SW at a height of 100m.
25.11.20	11.01	17	2	10	0	Commuting	Heath/Bog	Flock of 9 GP flying a height of 10-20m
25.11.20	11.05	18	9	0	30	On Ground, Flying	Heath/Bog	Flock of 30 GP flew up from ground when Hen Harrier flew over.
25.11.20	11.47	19	10	0	30	Flying	Heath/Bog	Flock of 40 GP flying over VP10, same route as flightline 11.
25.11.20	11.58	20	10	0	97	Flying	Heath/Bog	Flock of 67 GP flying over VP10 at a height of 40-60m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
25.11.20	12.01 - 13.12	21	10	0	4,290	Flying, on ground.	Forestry, Recolonising bare ground	Flock of 40 GP flying near substation to north of site and landed near substation. Flushed by Hen Harrier at 13.12.
25.11.20	12.08	22	10	0	45	Flying	Heath/Bog	Flock of 19 GP flying at a height of 40m to the west over VP10.
25.11.20	12.30	23	9	0	180	Flying		Flock of 200 GP flying at a height of 5-25m.
25.11.20	12.31	24	10	0	106	Flying	Heath/Bog	Flock of 15 GP flying at a height of 70-80m.
25.11.20	12.46	25	6	0	130	Flying	Grassland	Flock of 25 GP flying east.
25.11.20	13.29 - 13.49	26	10	0	1,165	Flying, on ground.	Heath/Bog	Flock of 68 GP flying at a height of 50-80m. A flock of 30 broke off and landed near the substation for 10 minutes.
25.11.20	14.01	27	10	0	300	Flying	Heath/Bog, Forestry	Flock of 68 GP flying near substation at a height of 40-80m, some birds left leaving 46 birds for the final 4 minutes.
25.11.20	14.31	28	8	10	0	Flying	Forestry, Heath/Bog	2 GP flew east the back west at a height of 30-50m.
25.11.20	14.37	29	8	5	0	Flying	Heath/Bog	Flock of 80 GP flying at height of 50-80m.
25.11.20	14.46	30	10	0	127	Flying	Forestry	Flock of 35 GP flying over forestry at a height of 60-80m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
27.11.20	9.15	31	7	75	0	Flying	Heath/Bog	Flock of 11 GP flying at a height of 10-30m.
27.11.20	9.17	32	7	45	0	Flying	Heath/Bog	Flock of 5 GP flying at a height of 20-30m
27.11.20	9.45	33	7	0	60	Flying	Heath/Bog	Flock of 60 GP flying at a height of 40-50m
27.11.20	10.13	34	4	15	0	Commuting		Flock of 50 GP flying at a height of 50-100m.
27.11.20	11.41	35	7	265	0	Flying	Forestry, Improved Grassland	Flock of 30 GP flying at a height of 150-200m.
27.11.20	11.52	36	7	157	0	Flying	Heath/Bog	Flock of 56 GP flying at a height of 50-100m.
27.11.20	12.05	37	3	10	33	Flying	Heath/Bog	Flock of 25 GP flying at a height of >100m.
27.11.20	12.10	38	1	10	0	Flying		Flock of 30 GP flying at a height of 25-100m.
08.12.20	9.33	39	7	70	0	Flying	Forestry, Grassland	Flock of 10 GP flying at a height of 100m
08.12.20	9.58	40	3	50	0	flying, Landed on bog	Heath/Bog	Flock of 14 GP landed on bog.
08.12.20	10.32	41	2	32	0	Flying	Heath/Bog	Flock of 10 GP flying at a height of 20-25m
08.12.20	12.12	42	7	130	0	Flying	Forestry, Grassland	Flock of 30 GP flying at a height of 120m.
08.12.20	13.47	43	7	110	0	Flying	Forestry, Grassland	Flock of 25 GP flying at a height of 120m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
08.12.20	14.00	44	4	30	0	Flying		Flock of 75 GP flying at a height of 25-100m.
10.12.20	8.34	45	10	0	10	Flying	Heath/Bog	Flock of 16 GP flying low (0-20m) and circling.
10.12.20	8.39	46	10	0	9	Flying	Heath/Bog	Flock of 22 GP flying at a height of <20m.
10.12.20	8.55	47	10	0	5	Flying	Heath/Bog	Flock of 11 GP flying at a height of <10m.
10.12.20	10.14	48	9	5	0	Flying	Heath/Bog	Flock of 40 GP flying at a height of 5-10m.
21.01.21	9.53	49	8	0	50	Flying	Bog, Forestry	Flock of c.100 flying at a height of 40-60m.
21.01.21	10.09	50	9	0	30	Flying	Bog, Forestry	Flock of c.60 flying at a height of 100m.
21.01.21	10.35	51	9	0	5	Flying	Heath/Bog	Flock of c.18 flying at a height of 25-100m.
21.01.21	10.35	52	9	0	21,600	On Ground	substation	Flock of GP on hardcore area in front of substation to the north of the site. Numbers varied throughout the day from 35-100 GP.
21.01.21	13.57	53	9	0	217	Flying	Bog, Forestry	Flock of 64 flying at a height of 100-120m within existing wind farm.
21.01.21	14.12	54	9	0	230	Flying	Heath/Bog	Flock of 46 GP flying at a height of 100m over VP and within existing wind farm.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
21.01.21	15.17	55	9	0	68	Flying	Heath/Bog	Flock of 26 GP flying at a height of 40-50m.
21.01.21	15.24	56	9	0	63	Flying	Forestry	Flock of 26 GP flying at a height of 80m.
22.01.21	10.50	57	3	10	180	Flying	Heath/Bog, Grassland	Flock of 35 GP flying at a height of 10-30m.
22.01.21	11.00	58	3	0	150	Flying	Heath/Bog, Grassland	Flock of 55 GP flying at a height of 10-50m.
22.01.21	11.13	59	3	0	120	Flying	Heath/Bog, Grassland	Flock of 70 GP flying at a height of 30-50m.
22.01.21	11.50	60	4	0	5	Flying	Heath/Bog	Flock of 20 GP flying at a height of 30m.
22.01.21	12.03	61	1	8	0	Flying	Bog, Forestry	Flock of 35 GP flying at a height of 50-100m.
22.01.21	12.30	62	3	0	35	Flying	Heath/Bog, Grassland	Flock of 6 GP flying at a height of <3m.
22.01.21	13.05	63	4	660	0	Flying	Bog, Forestry	Flock of 130 GP flying at a height of 30-200m.
22.01.21	13.08	64	3	0	90	Flying	Heath/Bog, Grassland	Flock of c.130 GP flying at a height of 80-100m.
22.01.21	13.17	65	6	30	0	Flying		Flock of c.100 GP flying at a height of 25-100m.
22.01.21	13.46	66	7	54	0	Flying	Heath/Bog	Flock of 20 GP flying at a height of 20-30m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.01.21	14.10	67	7	15	0	Flying	Heath/Bog	Flock of 6 GP flying at a height of 40m.
22.01.21	14.14	68	1	9	0	Flying	Bog, Forestry	Flock of 35 GP flying at a height of 100m.
22.01.21	14.22 - 14.29	69	1	420	0	Flying	Bog, Forestry	Flock of c.80 GP flying at a height of 100-150m.
22.01.21	14.23	70	4	120	0	Flying	Bog, Forestry	Flock of 50 GP flying at a height of 40-80m.
22.01.21	14.36	71	3	0	65	Flying	Heath/Bog, Grassland	Flock of 85 GP flying at a height of 80-100m.
22.02.21	10.16	72	3	0	60	Flying	Heath/Bog	Flock of 30 GP flying at a height of 5-25m.
22.02.21	10.28	73	3	0	10	Flying	Heath/Bog	Flock of 6 GP flying at a height of 5-25m.
25.02.21	10.10	74	5	0	120	Flying	Heath/Bog	Flock of c.200 GP flying at a height of 30-100m.
25.02.21	10.11	75	2	4	2	Flying	Heath/Bog	Flock of c.100 GP flying at a height of 100m.
25.02.21	10.25	76	9	0	500	Flying	Heath/Bog	Flock of c.400-500 GP flying at a height of 100m.
25.02.21	10.55	77	9	0	360	Flying	Heath/Bog	Flock of c.400 GP flying at a height of 100m.
25.02.21	11.12	78	9	60	120	Flying	Heath/Bog	Flock of 100 GP flying at a height of 25-100m.
25.02.21	11.18	79	2	8	0	Flying	Heath/Bog	Flock of 20 GP flying at a height of 50m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
25.02.21	11.30	80	9	0	180	Flying	Heath/Bog	Flock of c.400 GP flying at a height of 25-100m. C.100 landed briefly on the bog.
16.03.21	9.19	81	4	180	0	Flying	Heath/Bog	Flock of c.35 GP calling and flying at a height of 25-175m. May have landed.
16.03.21	9.27	82	1	95	0	Flying	Bog, Forestry	Flock of c.30 GP flying at a height of 100m.
16.03.21	9.33	83	4	90	0	Flying	Heath/Bog	Flock of c.25 GP flying at a height of 25-175m.
16.03.21	9.40	84	3	0	600	Flying	Heath/Bog	Flock of c.30 GP flying at a height of 25-100m.
16.03.21	10.17	85	4	30	0	Flying	Heath/Bog	Flock of c.35 GP flying at a height of <10m.
16.03.21	10.28	86	3	0	20	Flying	Heath/Bog	Flock of 3 GP flying at a height of 5-25m.
16.03.21	10.33	87	3	15	0	Flying	Heath/Bog	Flock of 15 GP flying at a height of 5-25m.
16.03.21	11.15	88	9	30	180	Flying	Bog, Forestry, Grassland	Flock of 9 GP flying at a height of 10-50m.
16.03.21	11.18	89	3 & 1	40	10	Flying	Heath/Bog, Rough Grassland	Flock of 30 GP flying at a height of 5-25m.
16.03.21	11.22	90	1 & 4	360	0	Flying	Heath/Bog, Rough Grassland	Flock of 25-30 GP flying at a height of 25-175m.
16.03.21	11.46	91	2	20	0	Flying	Heath/Bog	Flock of 20 GP flying at a height of 5-10m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.03.21	14.14	92	7	55	0	Flying	Bog, Forestry, Grassland	Flock of c.200 GP flying at a height of 20-50m.
16.03.21	14.22	93	7	0	75	Flying	Heath/Bog	Flock of c.400 GP flying at a height of >150m.
16.03.21	14.23	94	7	0	15	Flying	Heath/Bog	Flock of c.50 GP flying at a height of 50-60m, broke off from larger flock.
16.03.21	14.25	95	10	5	208	Flying	Forestry, Bog	Flock of c.100 GP flying at a height of 100-150m.
16.03.21	14.37	96	2	150	270	Commuting	Heath/Bog	Flock of c.350-400 GP flying at a height of 100-200m.
30.03.21	11.21	97	8	20	0	Flying	Forestry, Grassland	Flock of 38 GP flying at a height of 25-60m.
30.03.21	12.04	98	5	10	0	Flying	Heath/Bog	Flock of c.30 GP flying at a height of 5-25m.

Peregrine Falcon Observations

Peregrine Falcon Observations, Winter Season 2017/2018.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
09.11.17	14.37	1	5	0	60	Circling	Bog, Conifer Plantation	Adult Peregrine Falcon circled at 70m over VP5 and flew east down the valley.

Peregrine Falcon Observations, Winter Season 2018/2019 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
17.10.18	9.54	1	4	516	0	Flying	Heath/bog, rough grassland	Adult Peregrine Falcon flying over heath/bog and rough grass, initially seen at 0-5m AGL and ascending to a height of 25-100m AGL.
17.10.18	10.13	2	6	0	83	Flying	Improved grassland	Peregrine Falcon flying high (c. 230m AGL), off site.
17.10.18	10.17	3	1	11	0	Flying		Peregrine Falcon flying fast at a height of 20-30m.
17.10.18	11.18	4a	6	0	58	Flying	Rough grassland	Immature Peregrine Falcon flying off site, flew across valley and lost from view.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
17.10.18	11.33	4b	6	0	15	Circling	Conifer Plantation	Immature female Peregrine Falcon (presumed same as 4a) circling off site at 60m AGL.
17.10.18	14.17	5a	5	20	10	Foraging	Bog/heath, rough grassland	Peregrine Falcon hunting close to Carrigagulla hill at 50-100m AGL. Headed off to west and northwest and picked up by VP4 observer (see 5b).
17.10.18	14.21	5b	4	40	0	Flying	Conifer Plantation	Adult Peregrine Falcon flying over forestry northeast of VP4 before moving off to the east at a height of 30m.
22.11.18	10.17	6	2	40	147	Flying	heath/bog	Immature Peregrine Falcon flying over heath/bog north of VP2. Mobbed by Ravens and moved off to the north behind hill. Flying at a height of 10-40m AGL.
22.11.18	10.39	7	5	0	8	Flying	heath/bog	Immature Peregrine Falcon flying along the base of Carrigagulla hill at a height of 2-5m AGL.
15.02.19	9.53	8	1	6	0	Foraging	Rough grassland	Peregrine Falcon diving and fast flying at a height of 0-40m AGL.

Peregrine Falcon Observations, Winter Season 2019/2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.10.19	13.08	1	9	0	30	Hunting	Heath/Bog	Peregrine Falcon pursuing small flock of Snipe for 40 seconds. The birds and Falcon gained altitude and were lost from sight above clouds.
20.01.20	11.51	2	2	16440	0	Flying, On Ground	Heath/Bog	Female (probably sub-adult as noticeable streaking on breast) flying low and landing on bog. Remained on bog for remainder of survey. Moving a short distance several times. Still present at 16.25.
20.02.20	11.46	3	4 & 3	25	25	Flying, Perched	Heath/Bog, Conifer Plantation	Peregrine Falcon perched on rock, then flew off over heather bog and conifer forest at a height of 1-20m. Flew over VP3 and west over hill and out of view.
20.02.20	12.17	4a	4	30	0	Flying, Perched	Heath/Bog	Peregrine Falcon back again at previous perch, then flew over bog at height of 10-20m.
20.02.20	12.19	4b	1	5	0	Flying	Grassland	Peregrine Falcon flying northeast at a height at 20m. Lost from view behind treeline.
20.02.20	13.18	5	4	4	0	Flying	Heath/Bog	Peregrine Falcon seen flying over bog at a height of 5m.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
20.02.20	13.24	6	4	20	0	Flying	Heath/Bog	Peregrine Falcon seen flying over bog at a height of 10-25m.
20.02.20	13.30	7	1	3	0	Flying	Forestry	Peregrine Falcon seen briefly over forestry at a height of 10-15m.
20.02.20	13.44	8	3	18	0	Flying	Heath/Bog	Peregrine Falcon flew over VP3 at a height of 15m and flew west over hill and out of view.
20.02.20	14.42	9	4	10	10	Flying	Heath/Bog, Conifer Plantation	Peregrine Falcon flying over bog and forestry at a height of 10-25m.

Peregrine Falcon Observations, Winter Season 2020/2021 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
25.11.20	12.32	1	10	120	258	Flying	Heath/bog, Forestry	Peregrine Falcon moved east to west in front of VP 10 and over the hill behind VP8 at a height of 20-70m above ground level.
08.12.20	10.50	2	3	10	0	Commuting	Forestry	Male Peregrine Falcon flying at a height of 20m.
22.01.21	13.03	3	4	15	0	Commuting	Heath/Bog	Peregrine Falcon flying at a height of 10-20m.

Merlin Observations

Merlin Observations, Winter Season 2018/2019 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
16.03.18	9.17	1	6	0	28	Perched, Flying	Rough Grassland	Female/immature Merlin perched on Hawthorn for 20 secs, then flew over rough grassland at a height of 20-30m for 8 secs.

Merlin Observations, Winter Season 2019/2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.10.19	12.46	1	10	0	15	Flying	Heath/Bog	Female/immature Merlin flying over heath/bog at a height of 10m above ground level.
22.10.19	14.07	2	10	0	20	Flying	Heath/Bog	Female/immature Merlin flying over heath/bog at a height of 10m above ground level.
27.02.20	11.37	3a	10	0	900	Flying, Perched	Blanket Bog	Possible merlin perched on a fencing pole c 1km from VP10 for almost 15mins, flew low over bog in

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
								westerly direction before disappearing in bog.
27.02.20	12.33	3b	10	0	3	Flying, Perched	Blanket Bog	Possible Merlin perched on pole west of VP10 and flew briefly before disappearing into bog

Merlin Observations, Winter Season 2020/2021 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.01.21	11.23	1	4	20	0	Flying	Heath/Bog	Female Merlin flying at a height of 5-10m.
22.01.21	11.39	2	4	5	0	Flying	Heath/Bog	Female Merlin flying at a height of 1m.
16.03.21	12.06	3	4	60	0	Flying	Forestry, Bog	Male Merlin flew west across bog, then over forestry at a height of <10m.

Red Kite Observations

Red Kite Observations, Winter Season 2019/2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
22.10.19	12.32 - 12.45	1	5 & 6	480	359	Flying	Improved Grassland, Forestry, Heath	Red Kite (no wing tags) flying west/southwest. Initially seen south/southwest of VP5 over improved grassland at a height of 150-200m. Mobbed by Hooded Crows/Rooks. Glided/flew off to the west/southwest and dropped down out of sight (80-100m AGL).

White-tailed Sea Eagle Observations

White-tailed Sea Eagle Observations, Winter Season 2019/2020 Survey.

Date	Time	Observation No.	VP	On Site Observation Time (secs)	Off Site Observation Time (secs)	Activity	Habitat	Details
20.03.20	11.17 - 11.26	1	9	420	120	Flying	Heath/Bog & Forestry	Juvenile White-tailed Sea Eagle flew from the east over forestry to the east of VP9, being mobbed by crow, flew in a west/north westerly direction over bog near VP9, circled over forestry north west of VP9 before turning south and flying over the centre of the site in a south westerly direction circling and flying, circling over the peak of Musheramore, then flying off to the west/south west out of sight. Red tag on eagle's wing, numbers not decipherable, appeared to be juvenile as no distinct white tail apparent. Flight height 40-250m.

Figure 18 Winter 2017-2018 Golden Plover

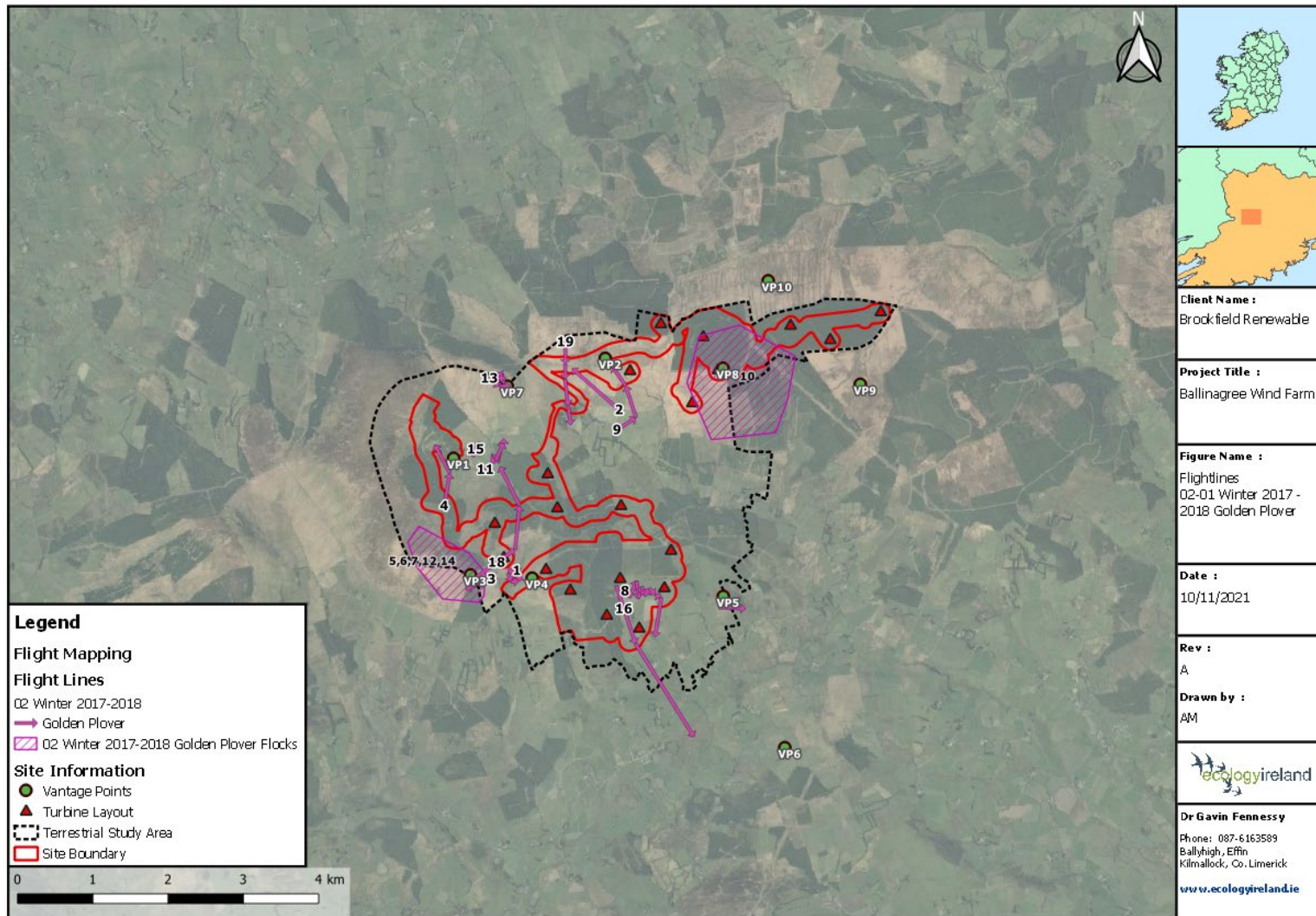


Figure 19 Winter 2017-2018 Hen Harrier

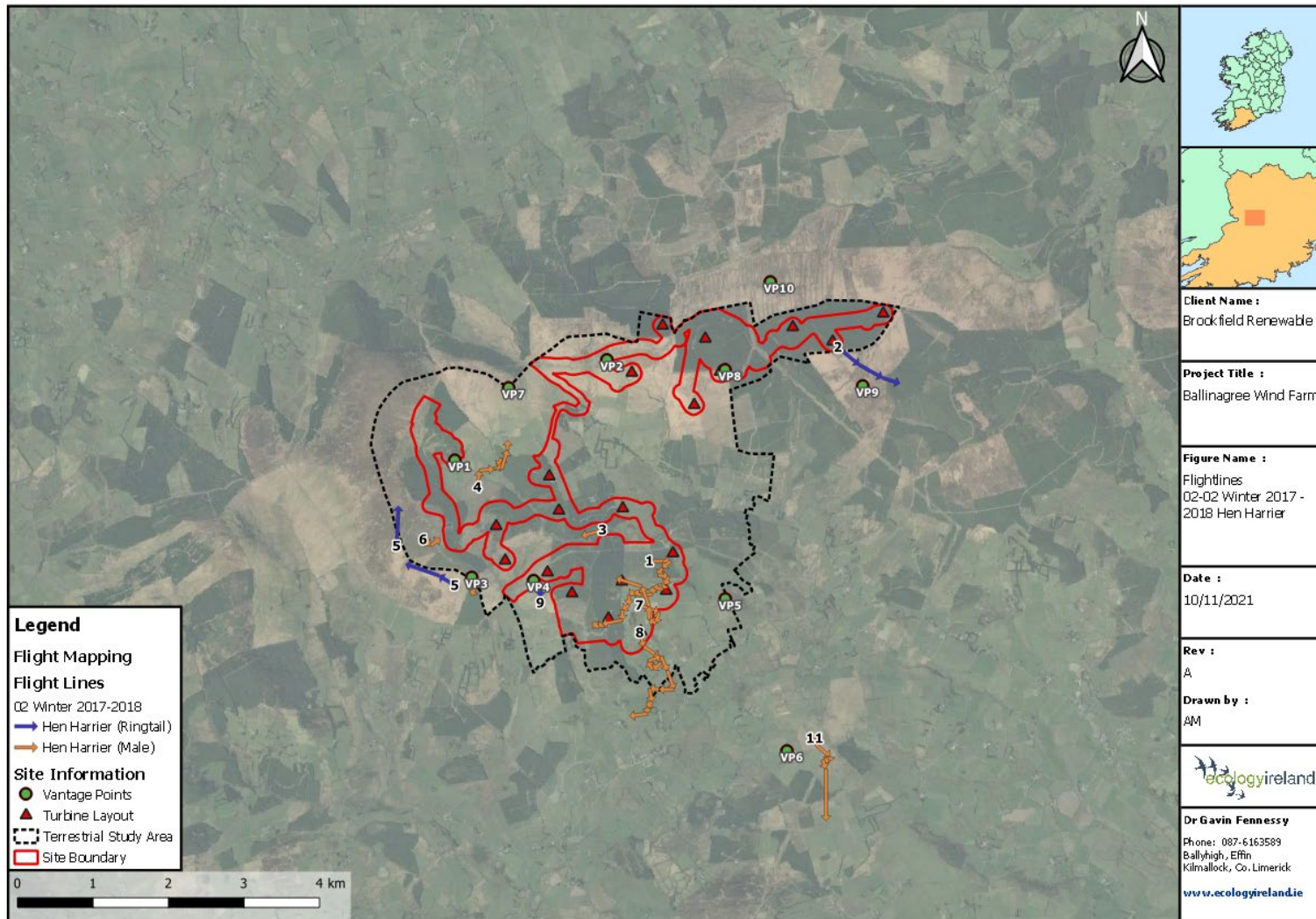


Figure 20 Winter 2017-2018 Peregrine

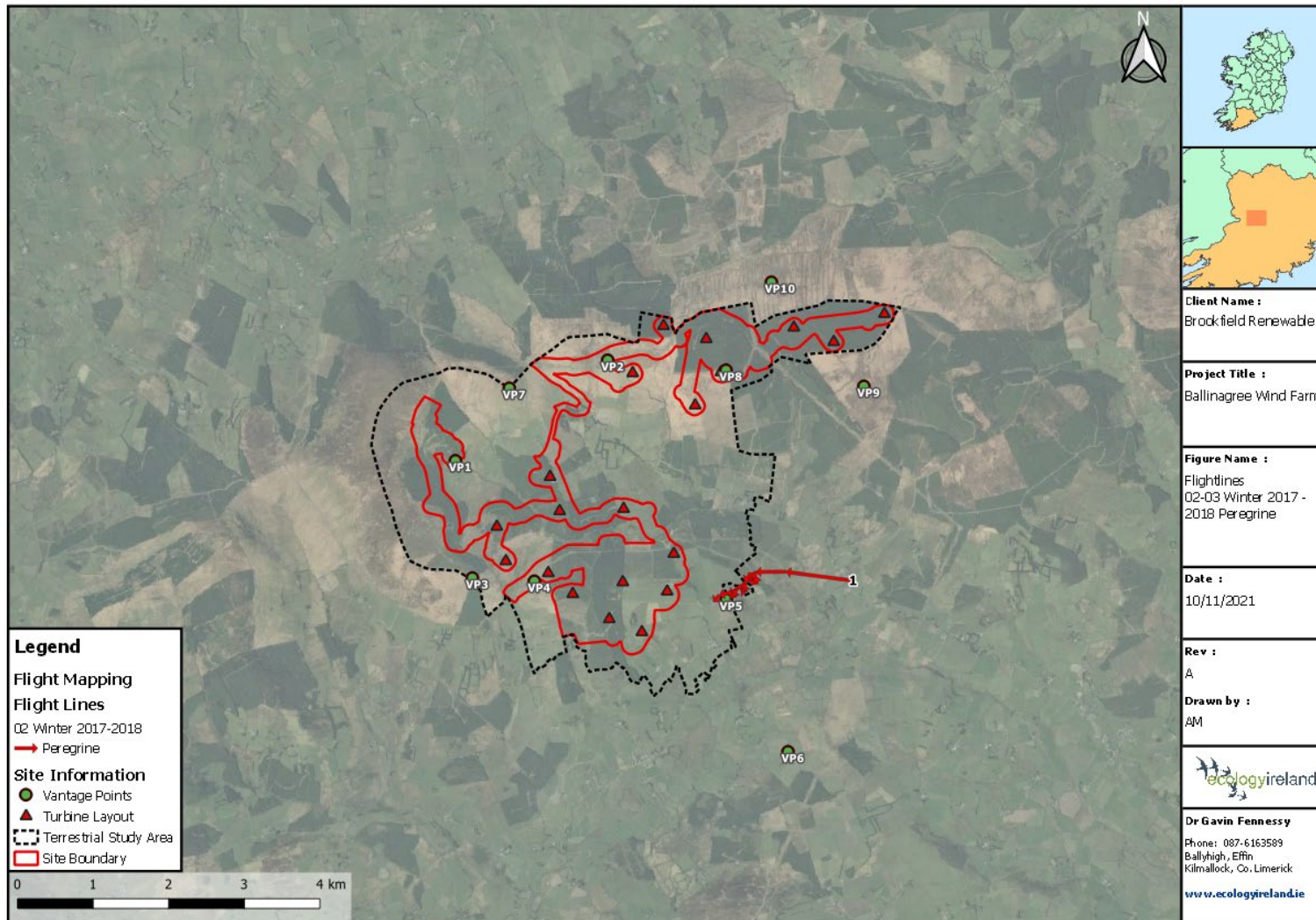


Figure 21 Winter 2017-2018 Merlin

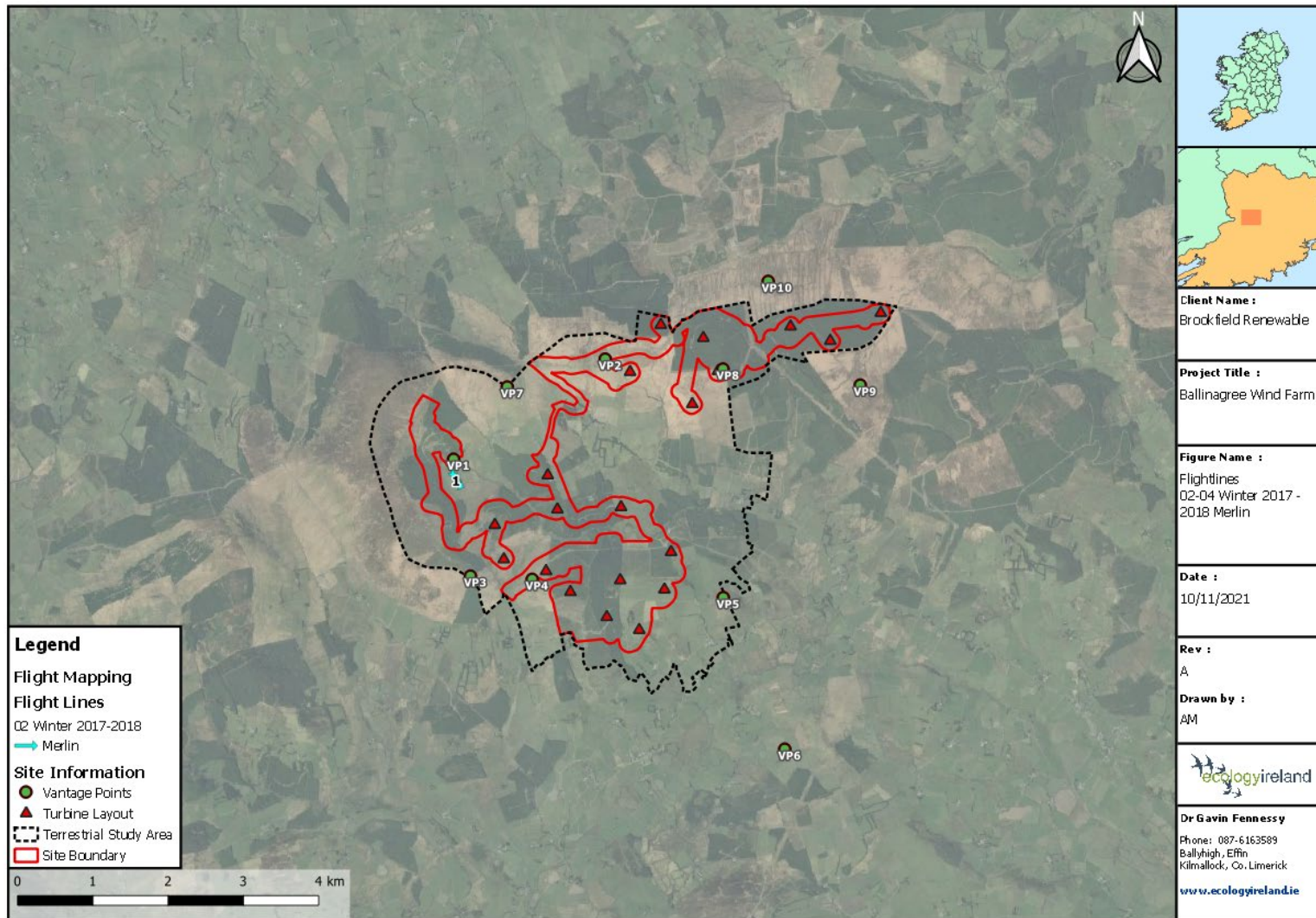


Figure 22 Winter 2018-2019 Golden Plover

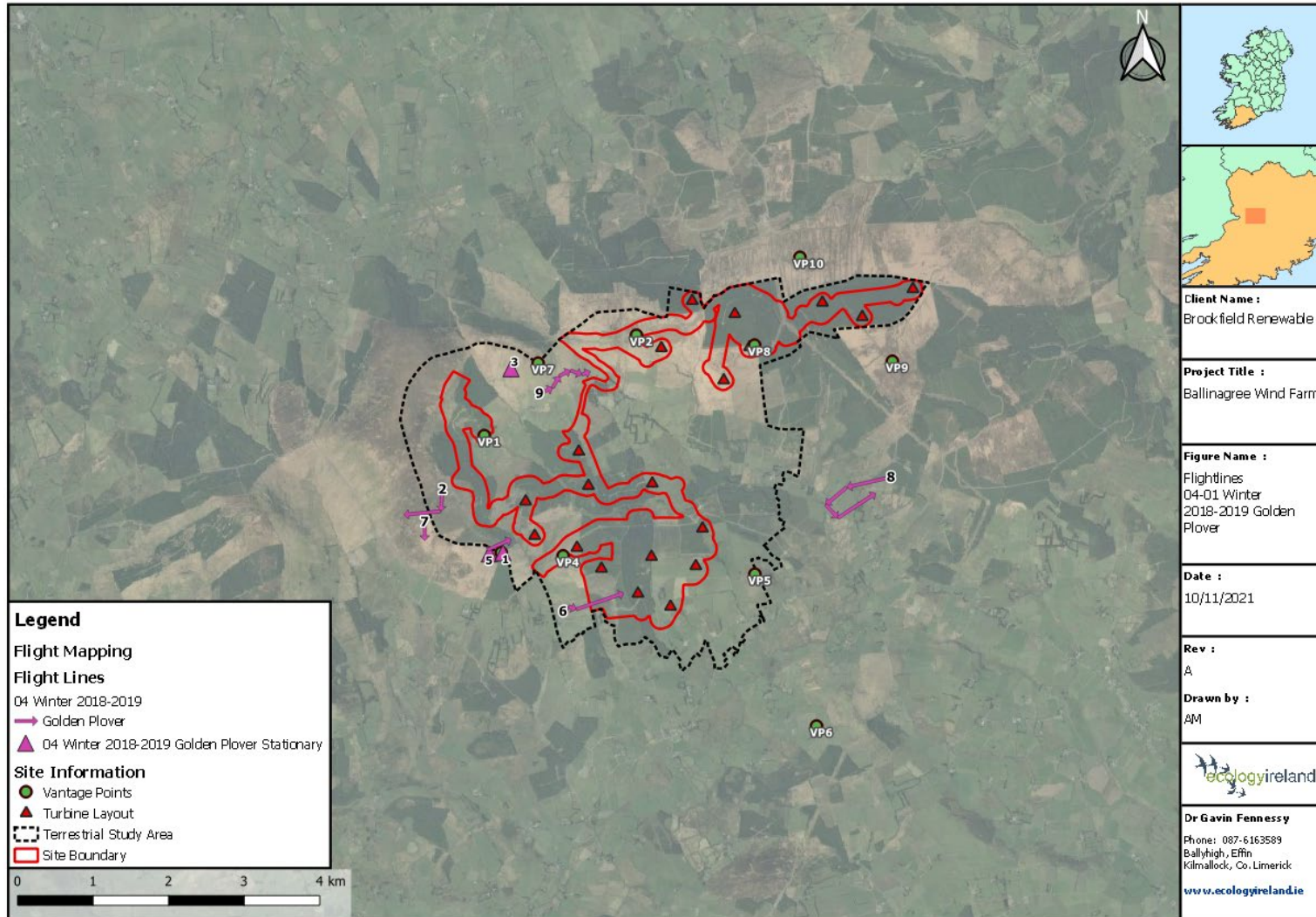


Figure 23 Winter 2018-2019 Hen Harrier

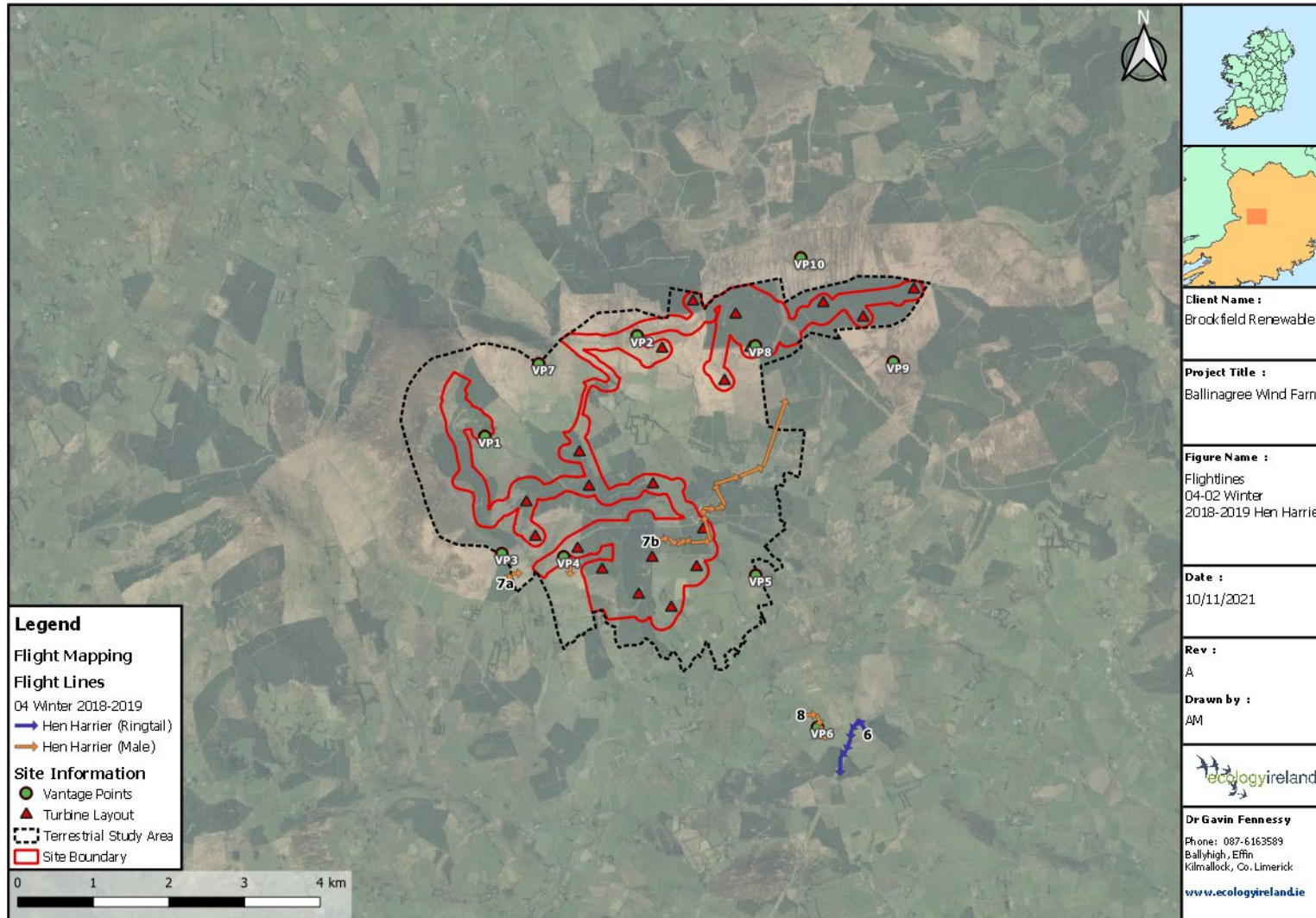


Figure 24 Winter 2018-2019 Peregrine

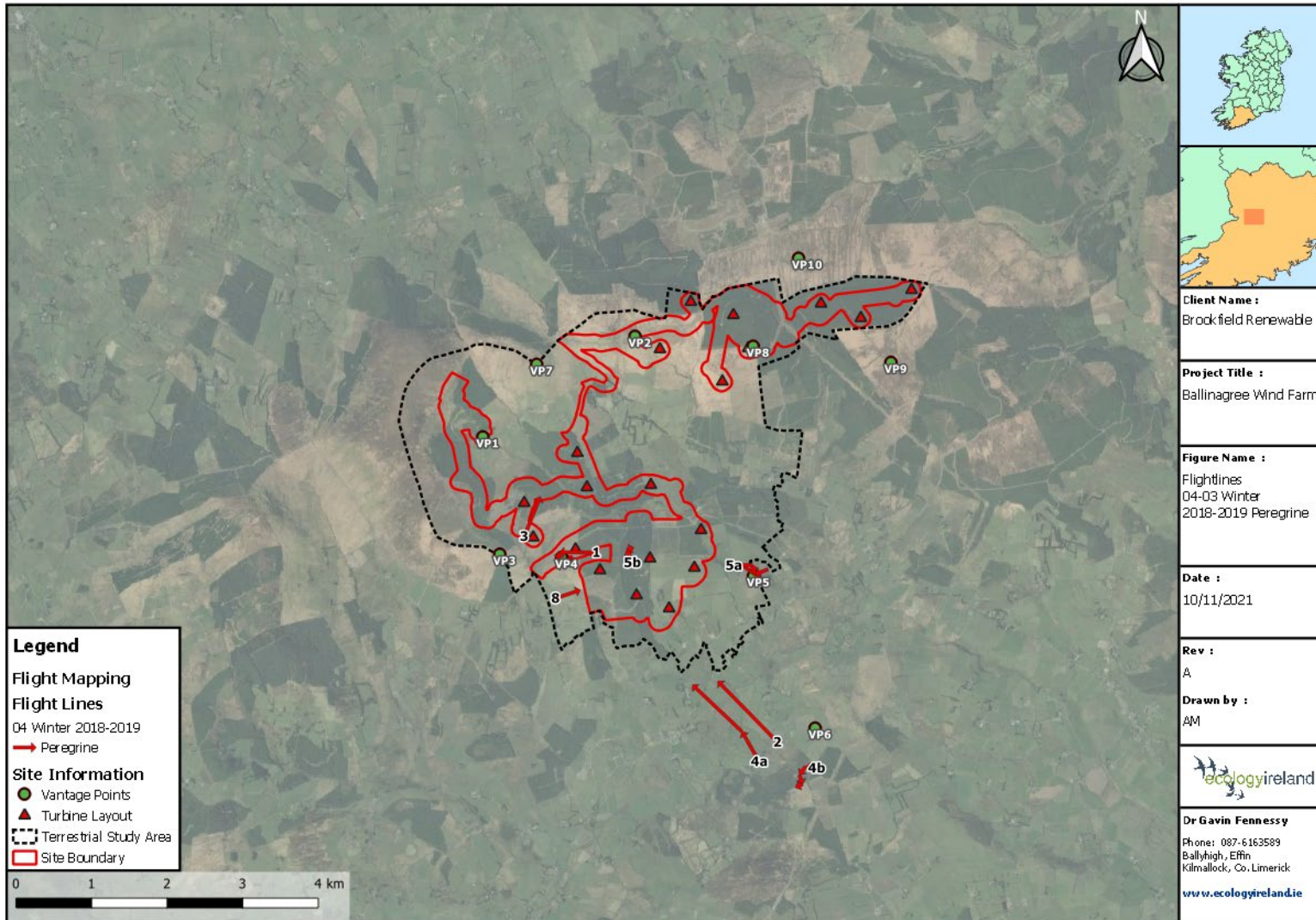


Figure 25 Winter 2018-2019 Merlin

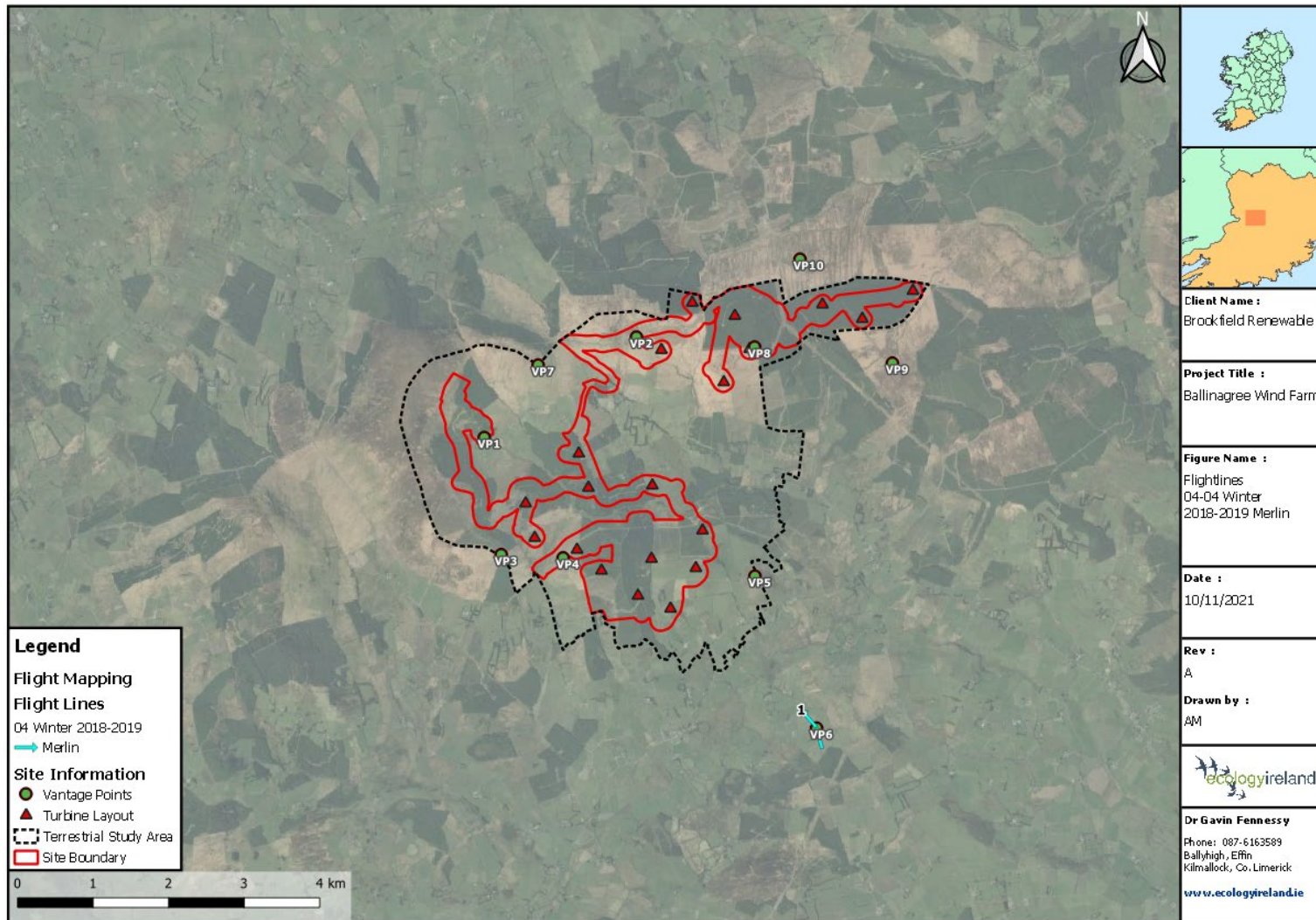


Figure 26 Winter 2018-2019 Hen Harrier Part 2

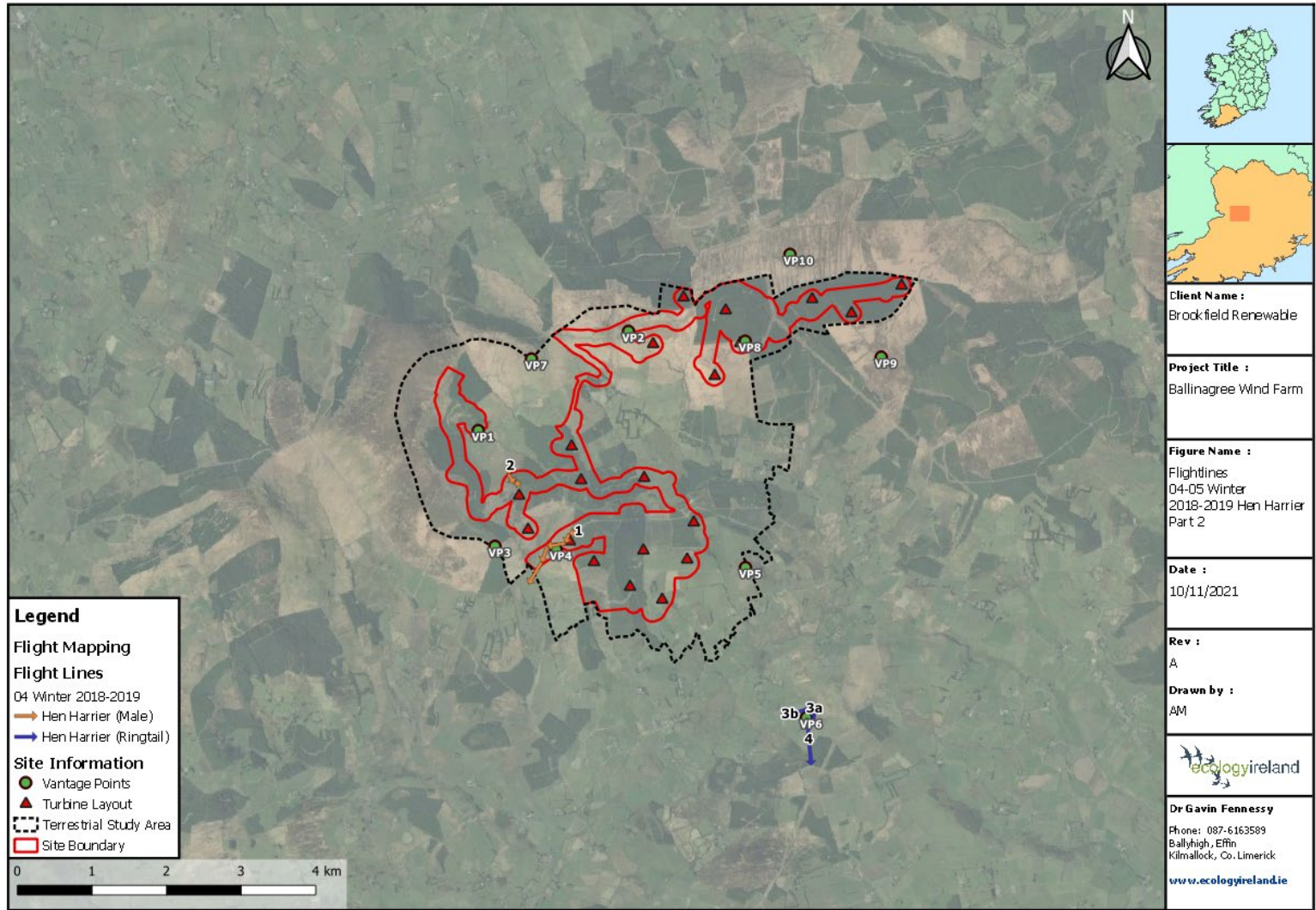


Figure 27 Winter 2019 – 2020 Golden Plover

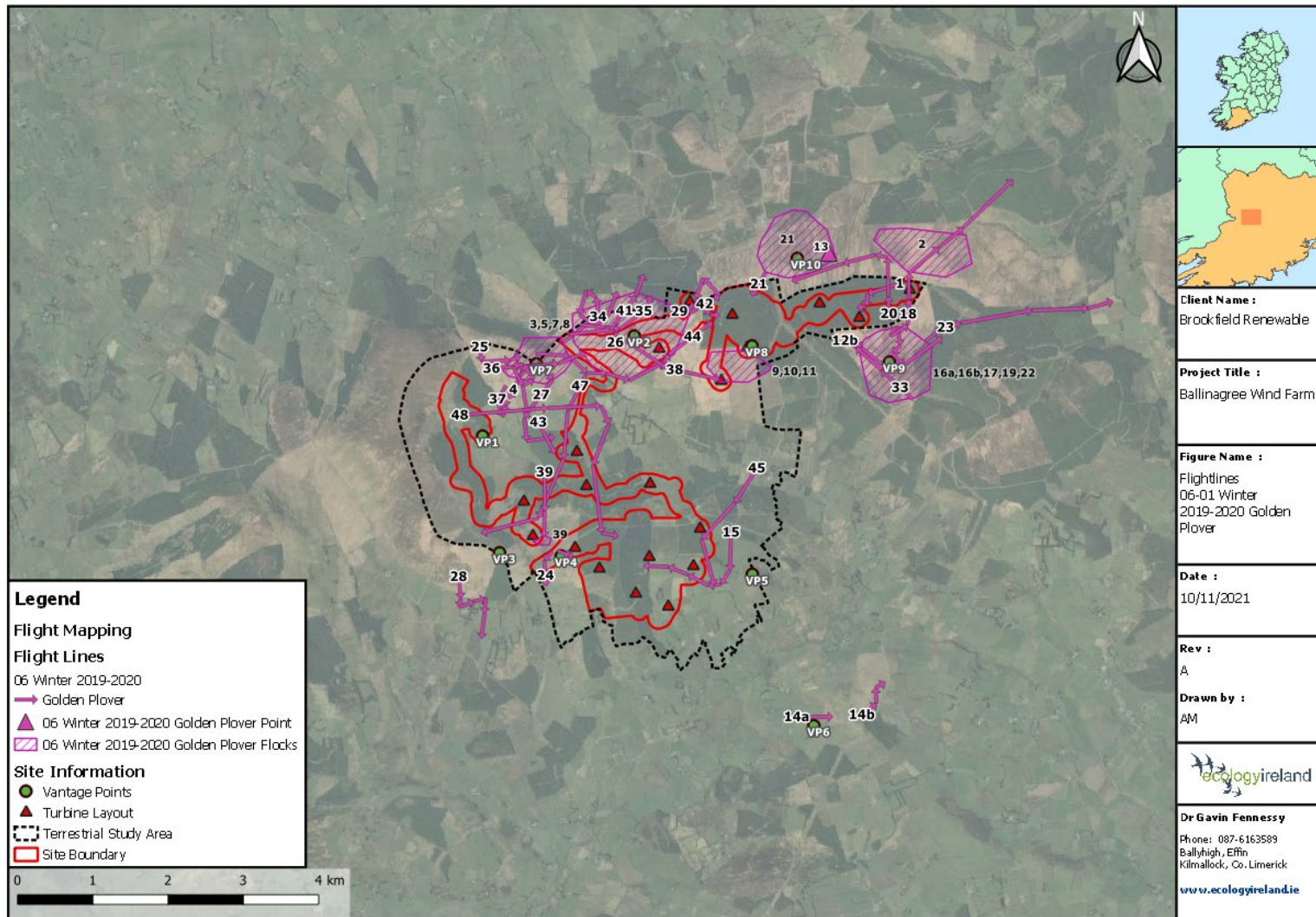


Figure 28 Winter 2019-2020 Hen Harrier

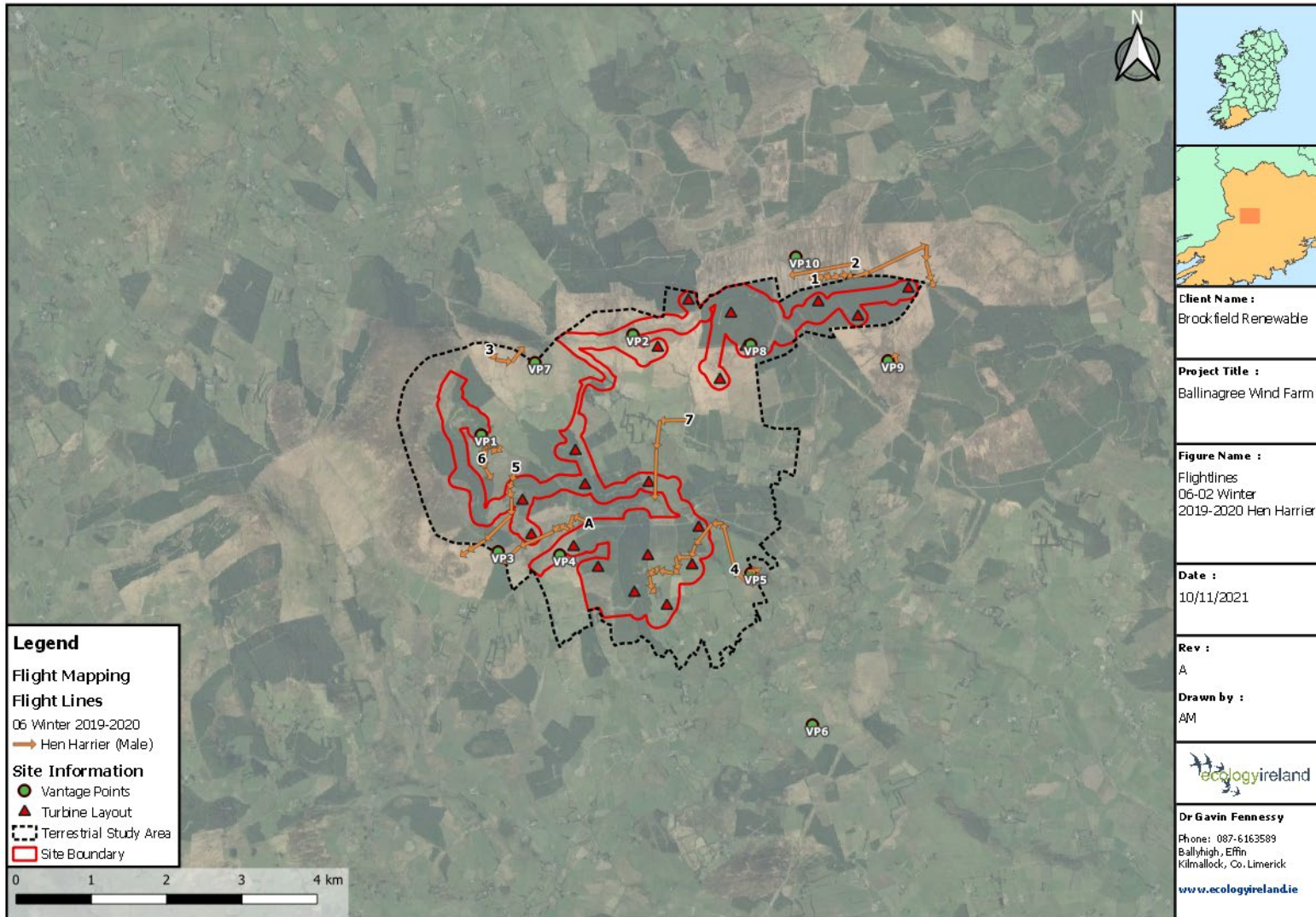


Figure 29 Winter 2019-2020 Peregrine

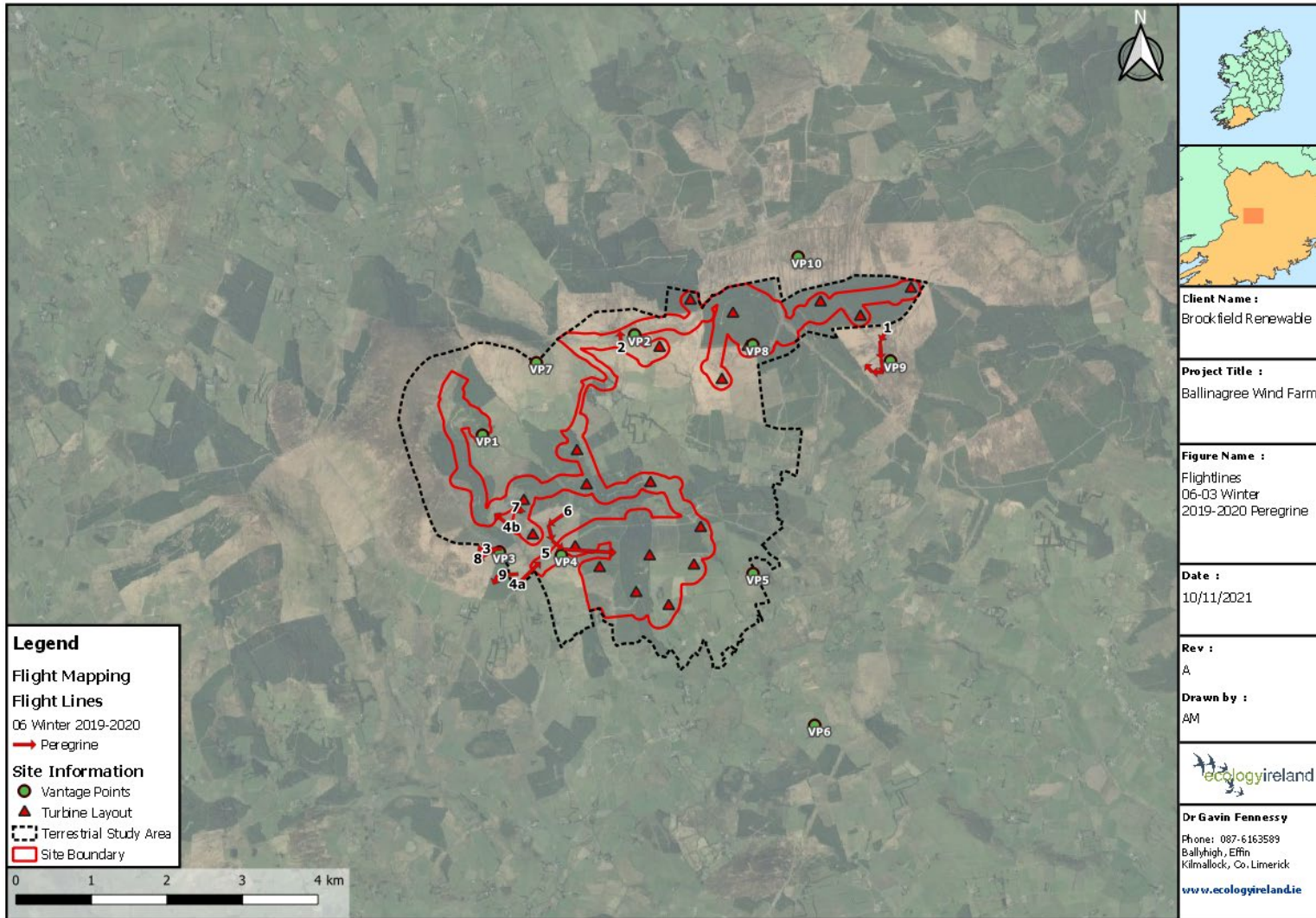


Figure 30 Winter 2019-2020 Merlin

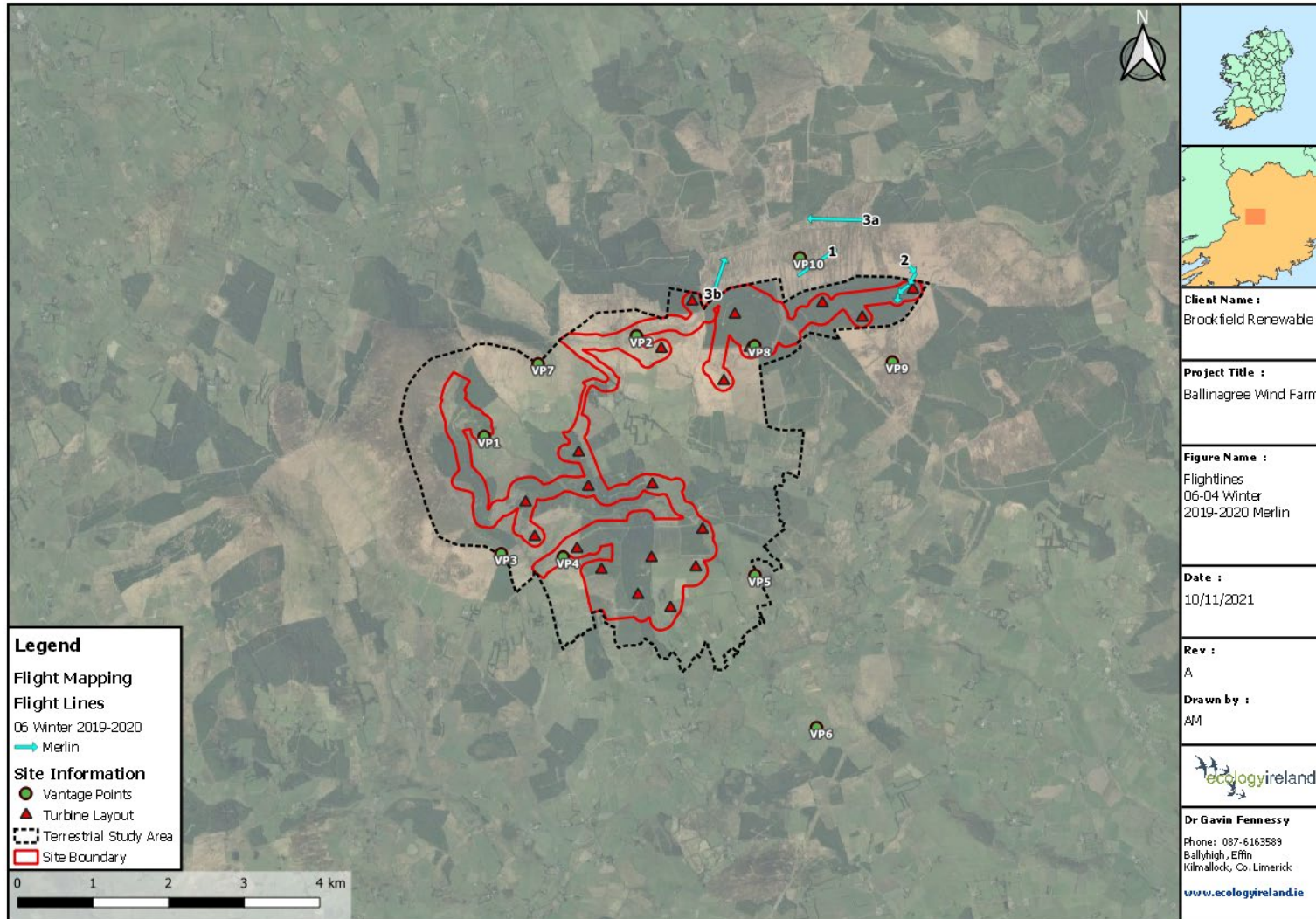


Figure 31 Winter 2019-2020 Golden Plover January

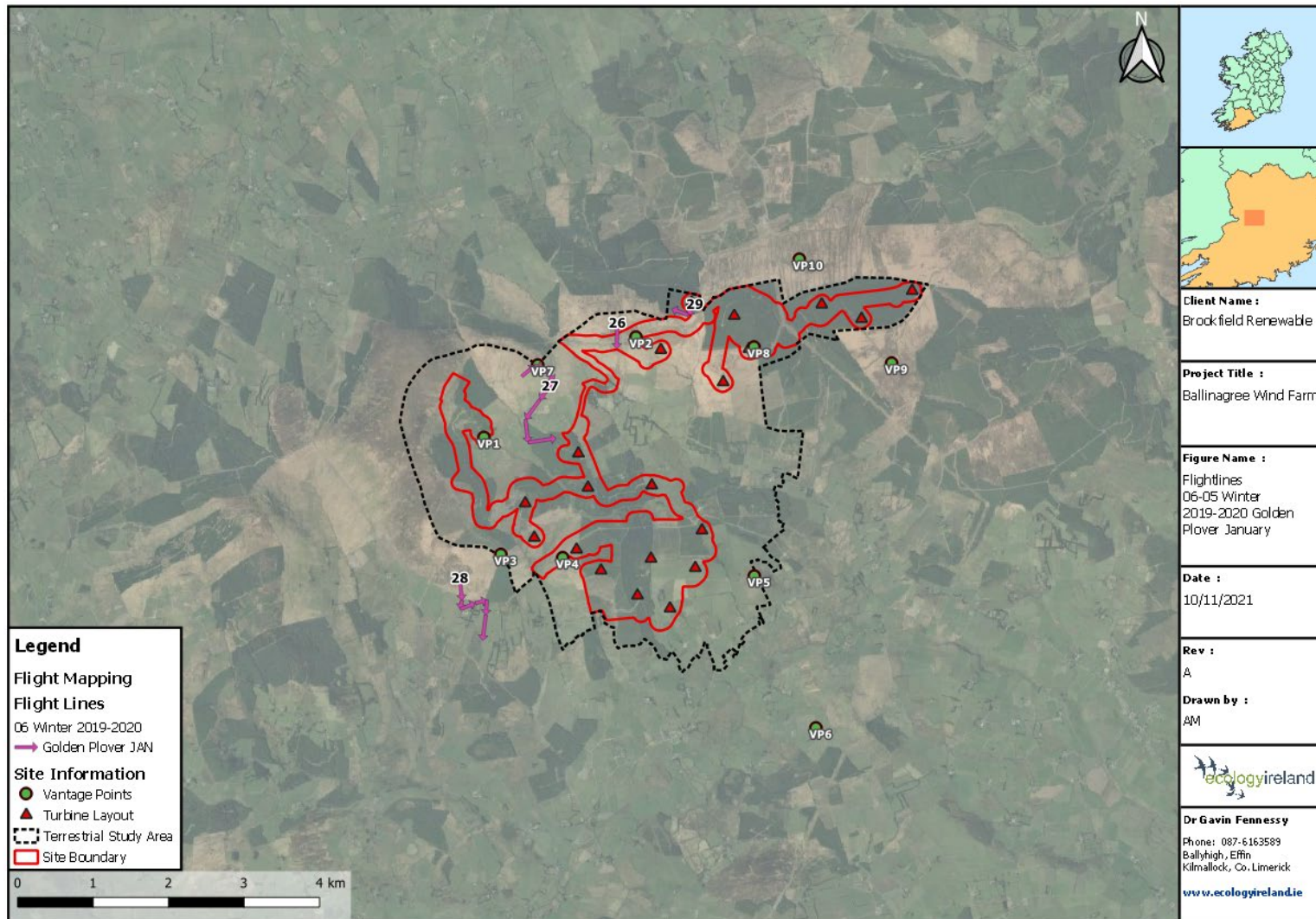


Figure 32 Winter 2019-2020 Golden Plover February

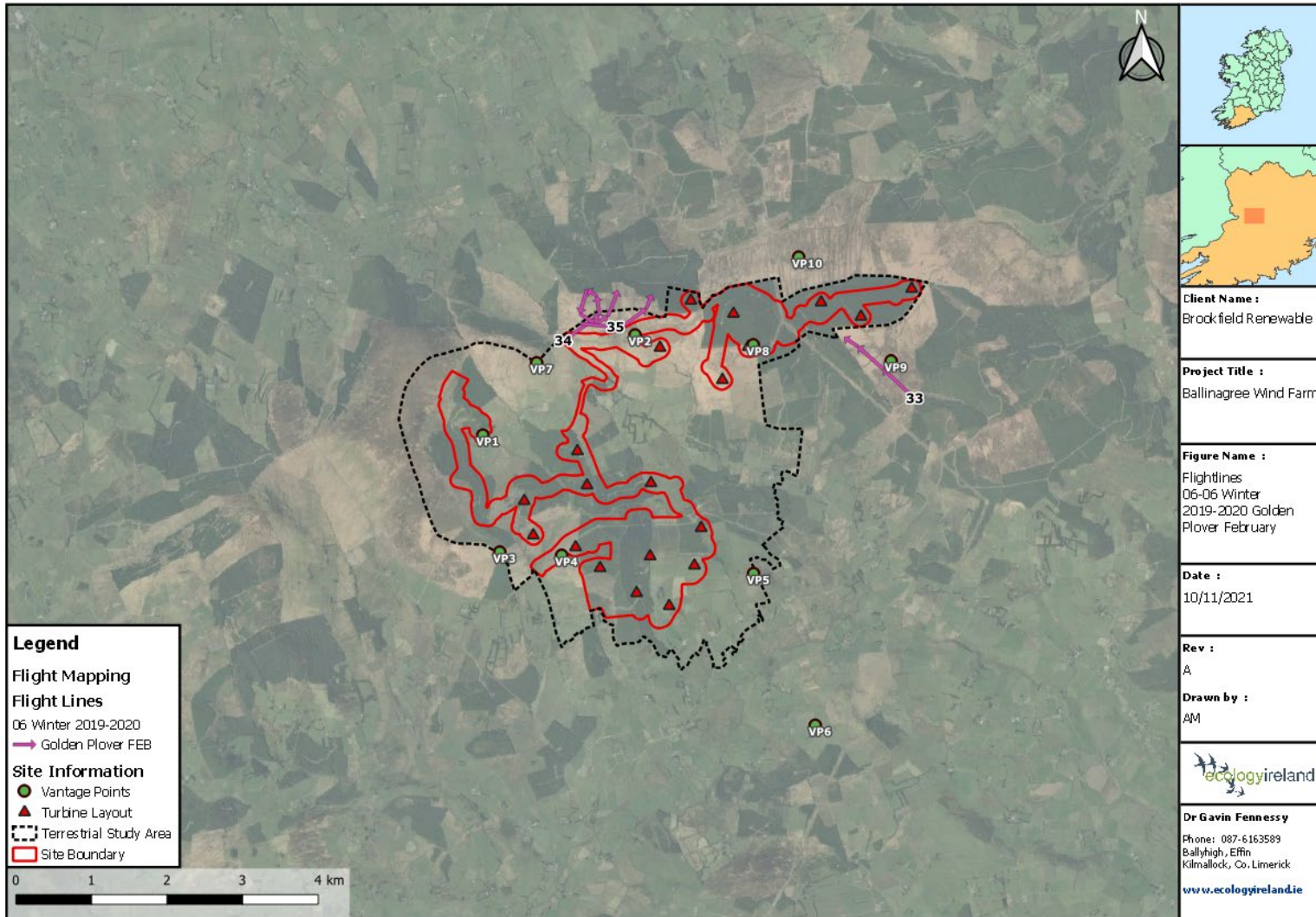


Figure 33 Winter 2019-2020 Golden Plover March

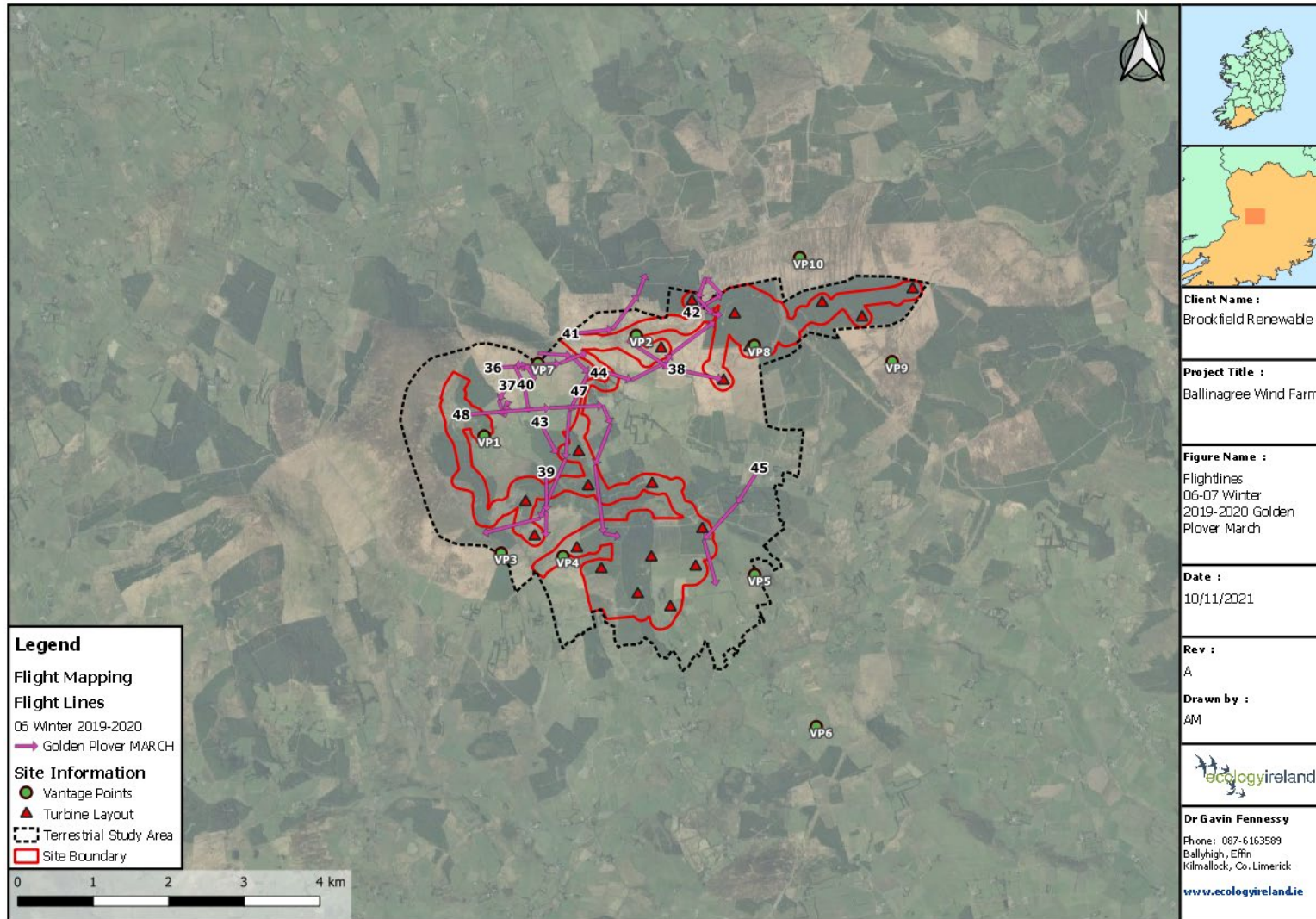


Figure 34 Winter 2019-2020 White Tailed Sea Eagle



Figure 35 Winter 2019-2020 Red Kite

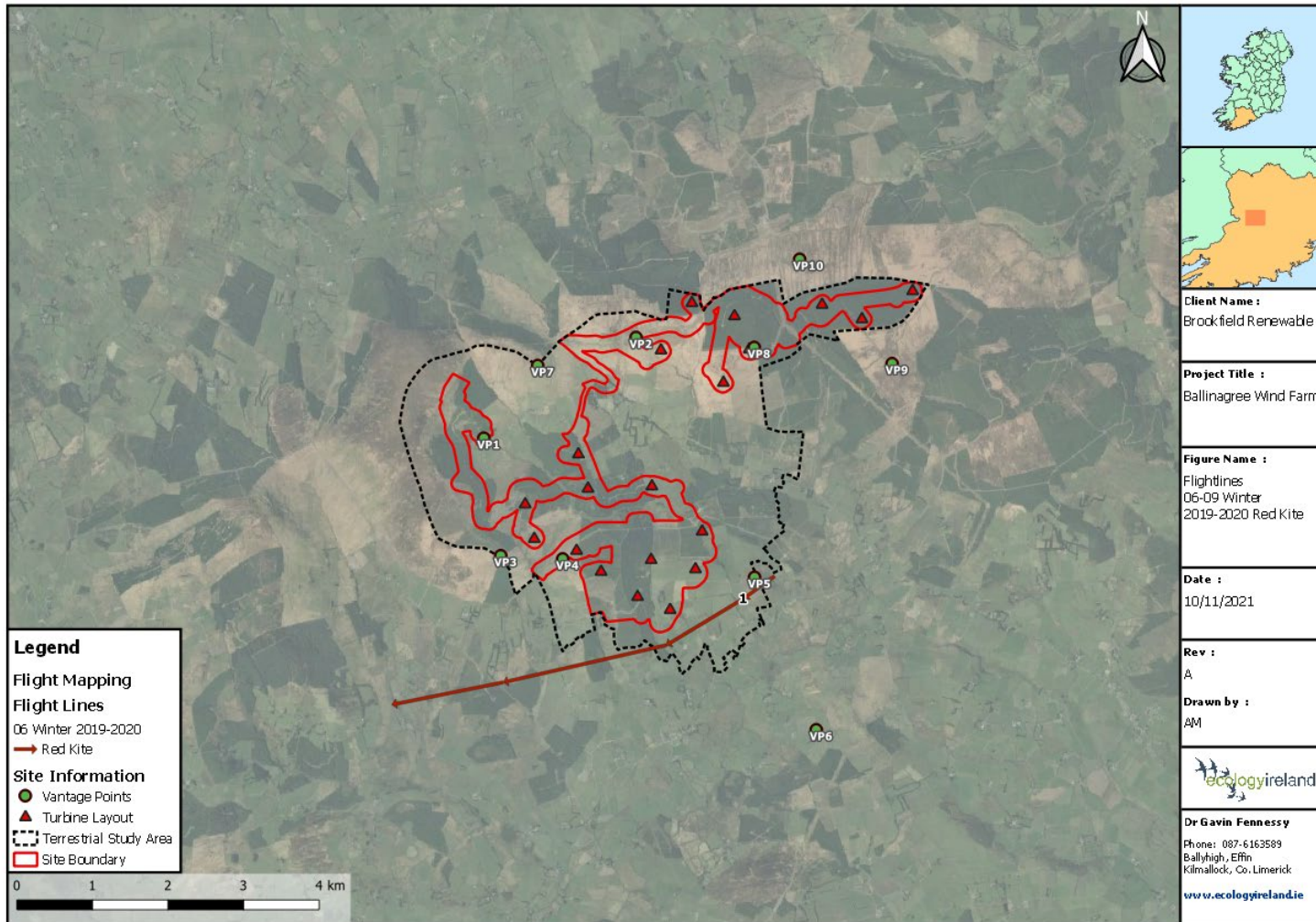


Figure 36 Winter 2019-2020 Red Grouse

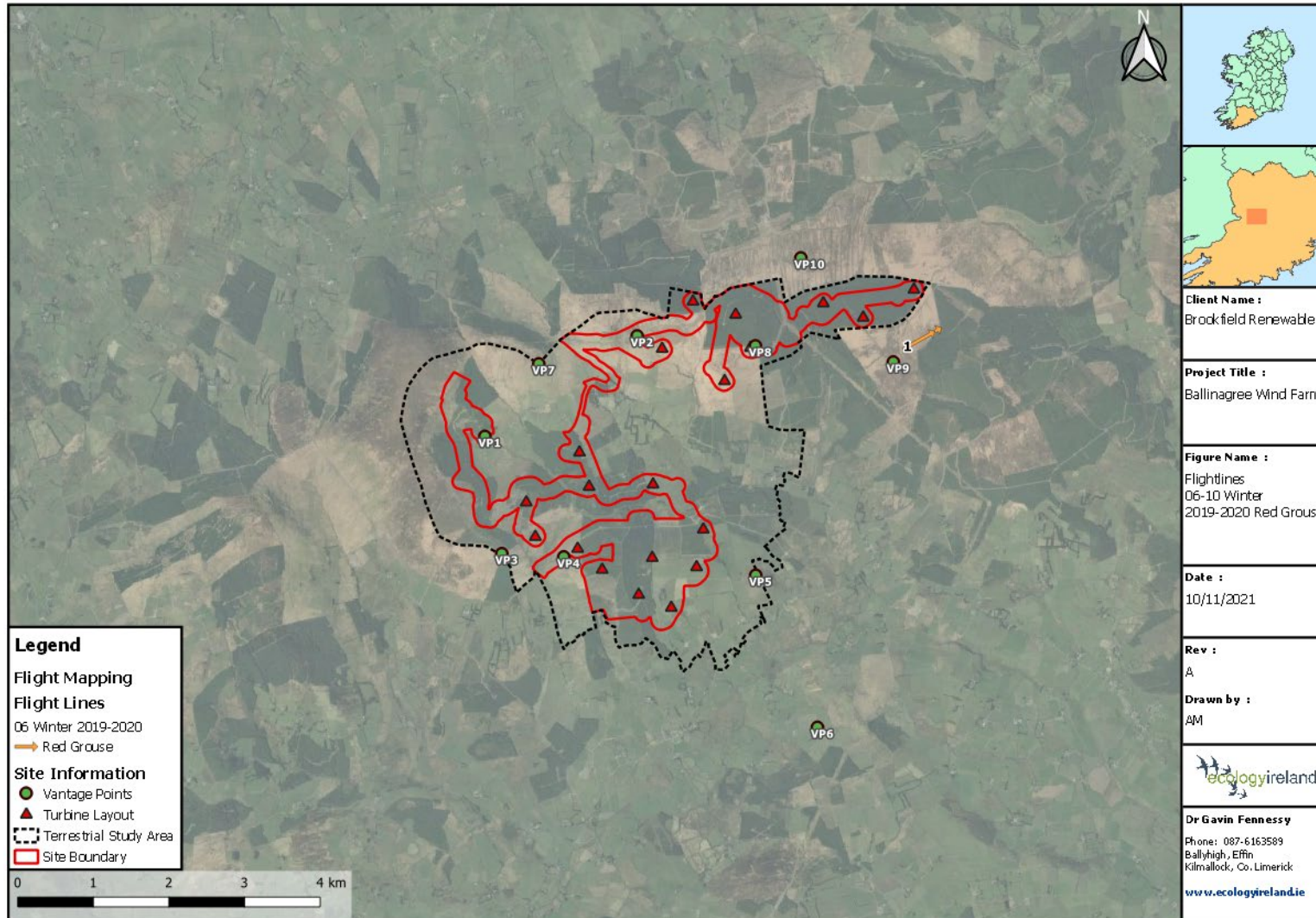


Figure 37 Winter 2020-2021 Golden Plover

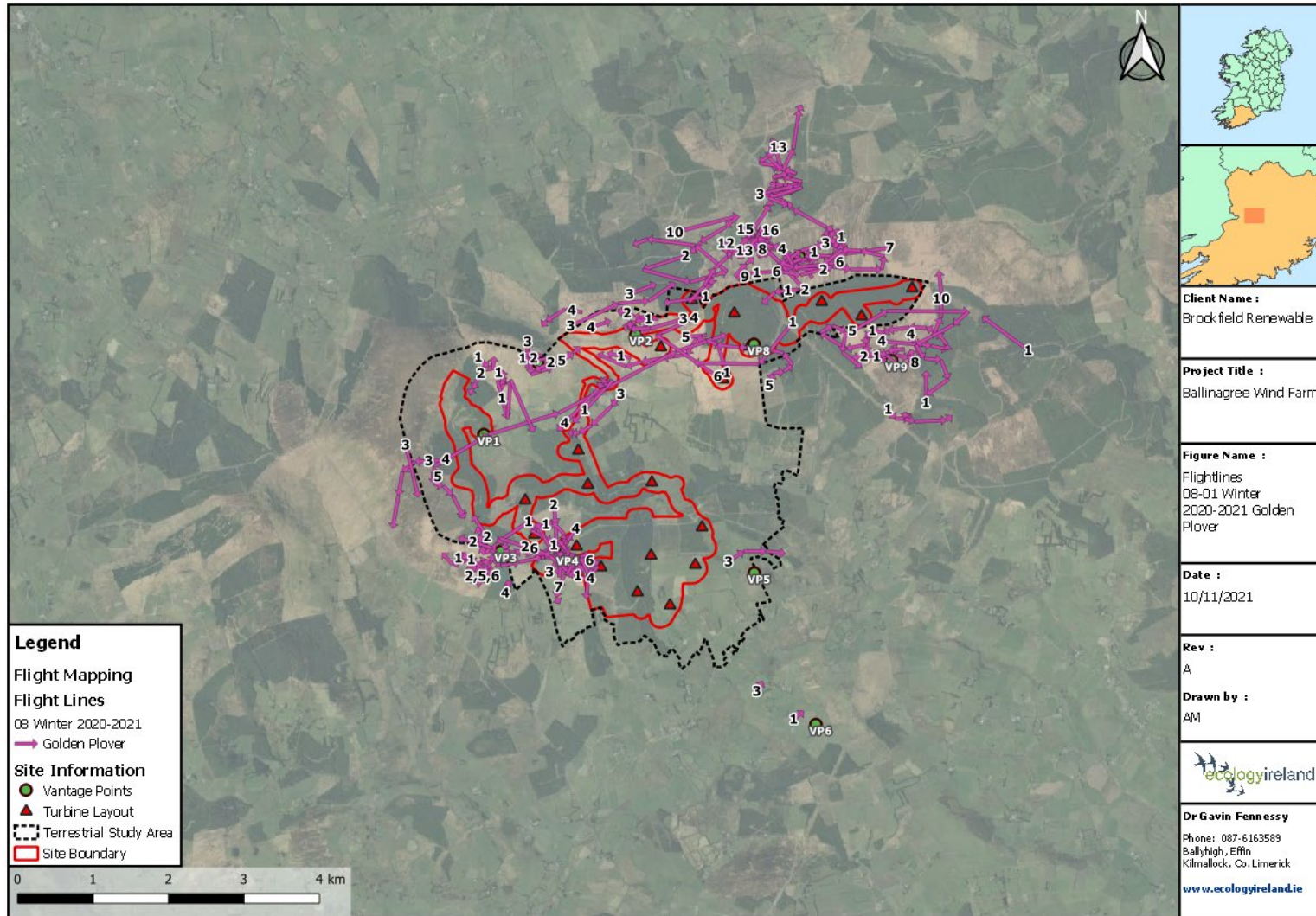


Figure 38 Winter 2020-2021 Golden Plover October

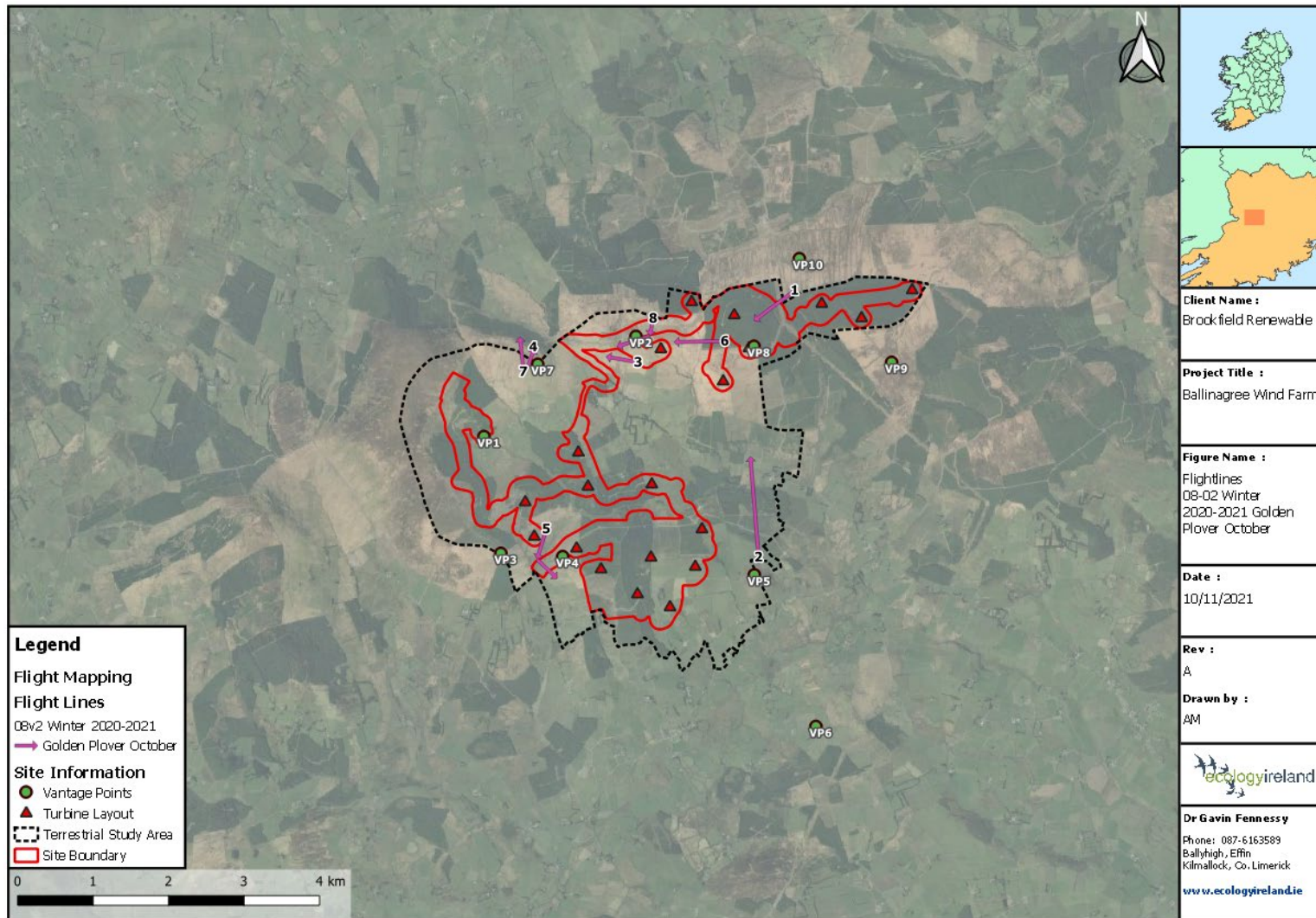


Figure 39 Winter 2020-2021 Golden Plover November

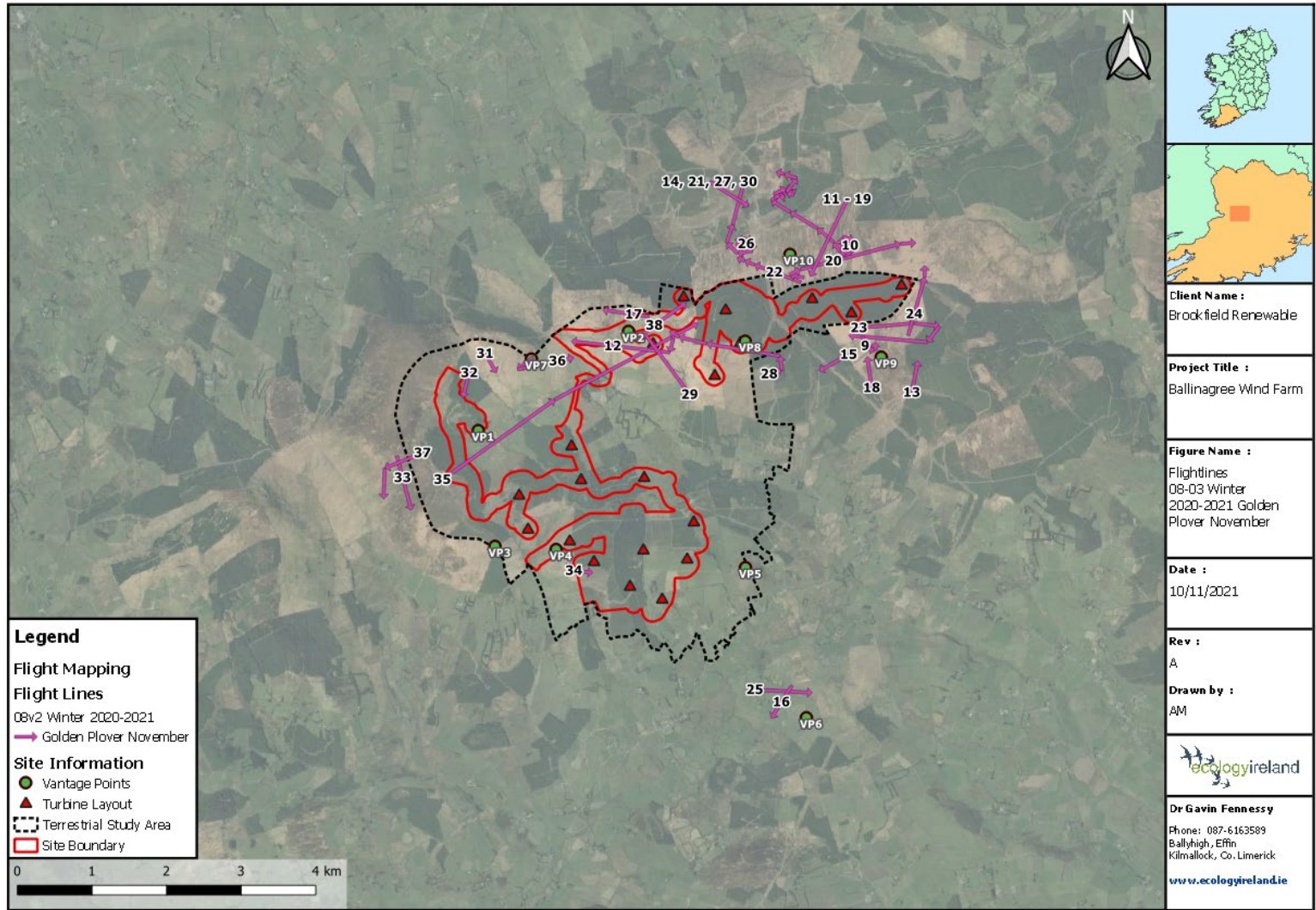


Figure 40 Winter 2020-2021 Golden Plover December

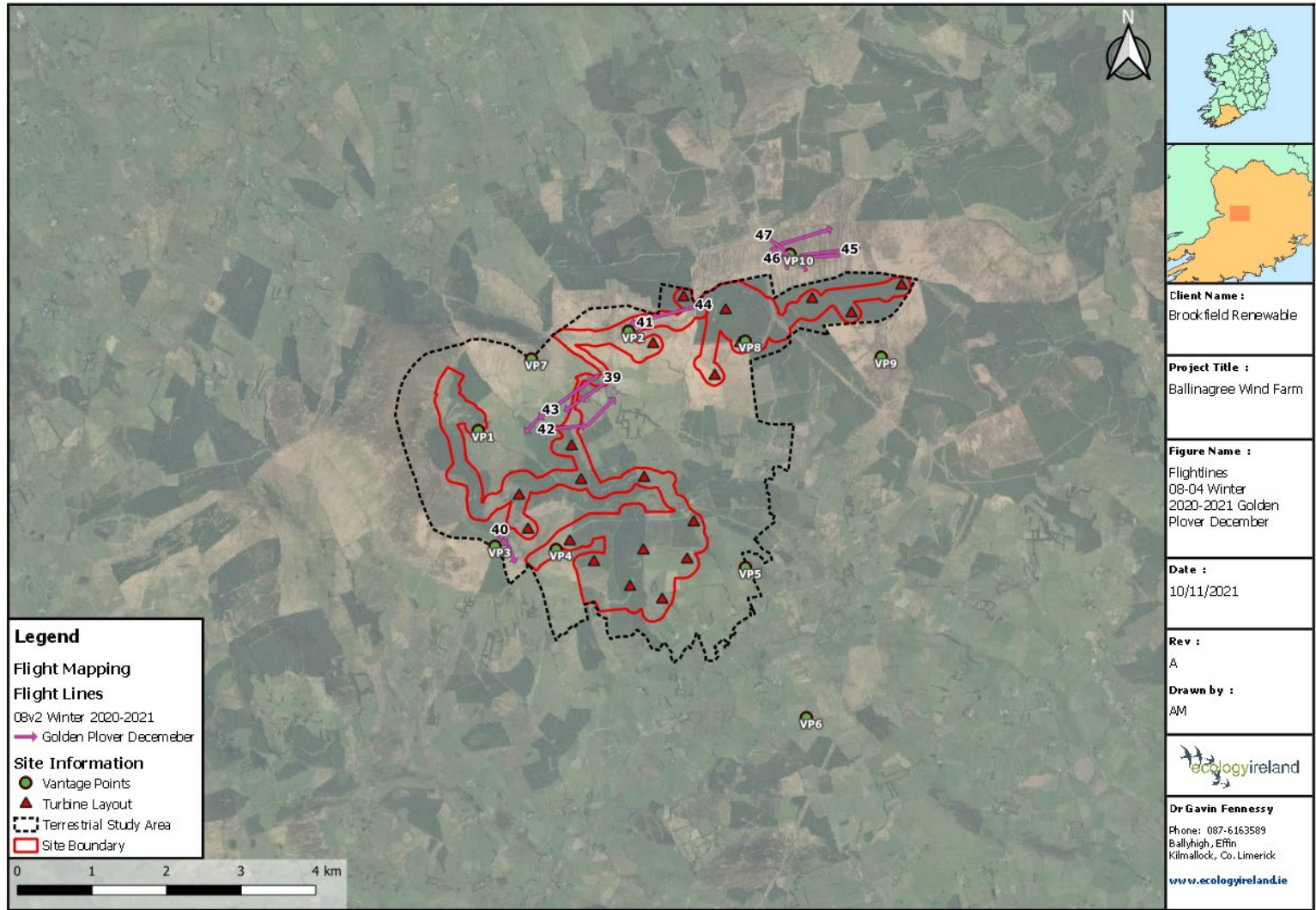


Figure 41 Winter 2020-2021 Golden Plover January

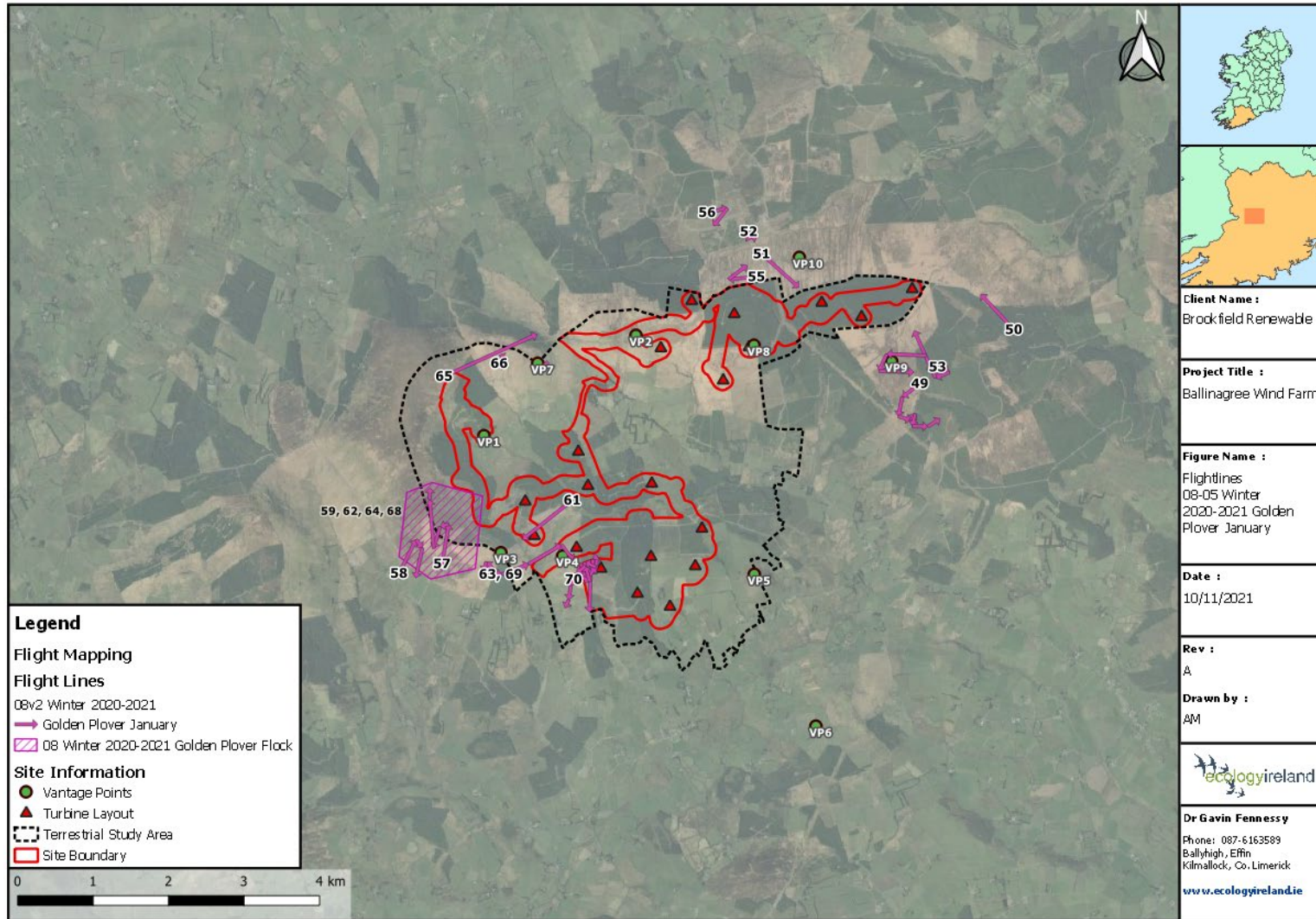


Figure 42 Winter 2020-2021 Golden Plover February

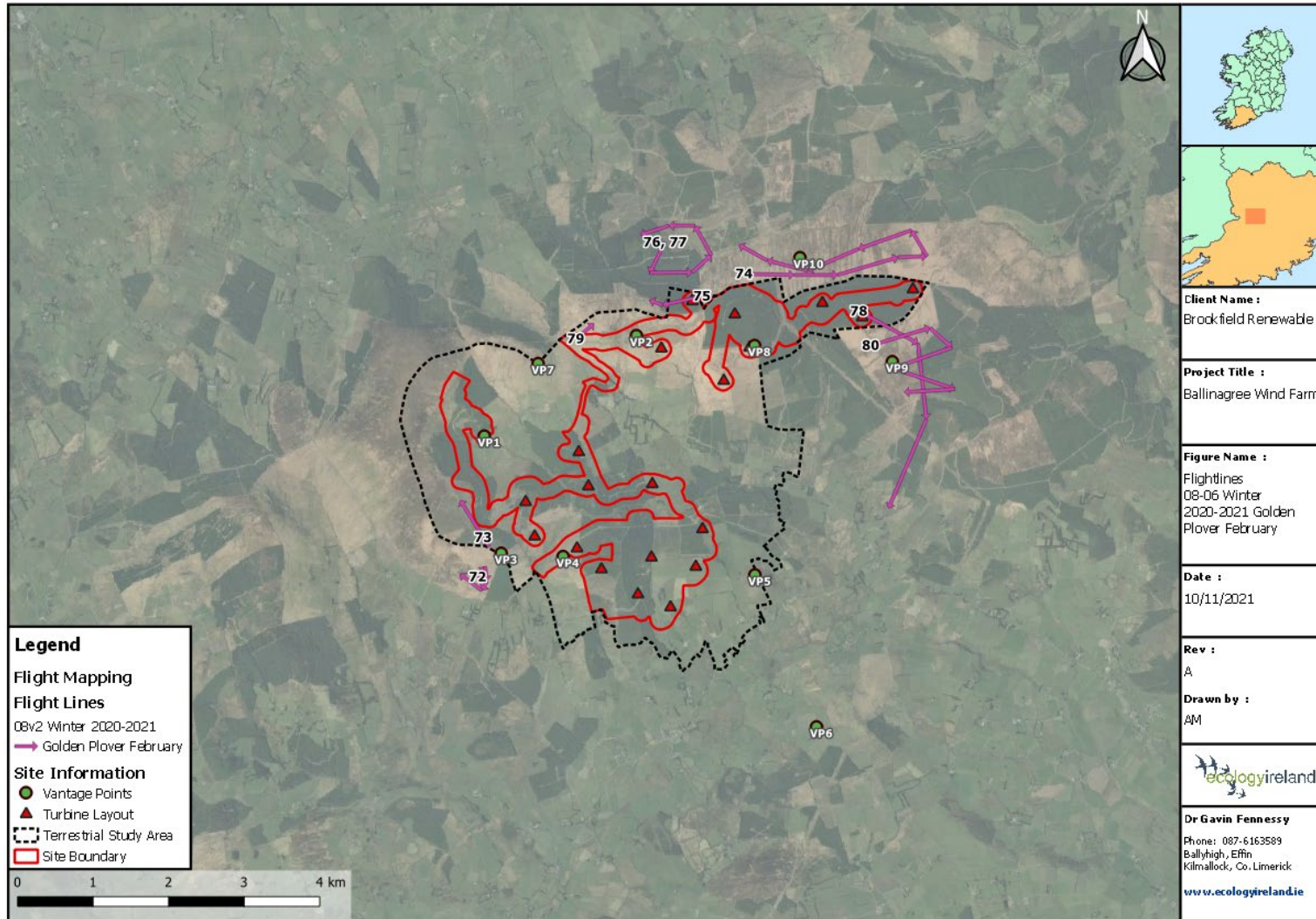


Figure 43 Winter 2020-2021 Hen Harrier

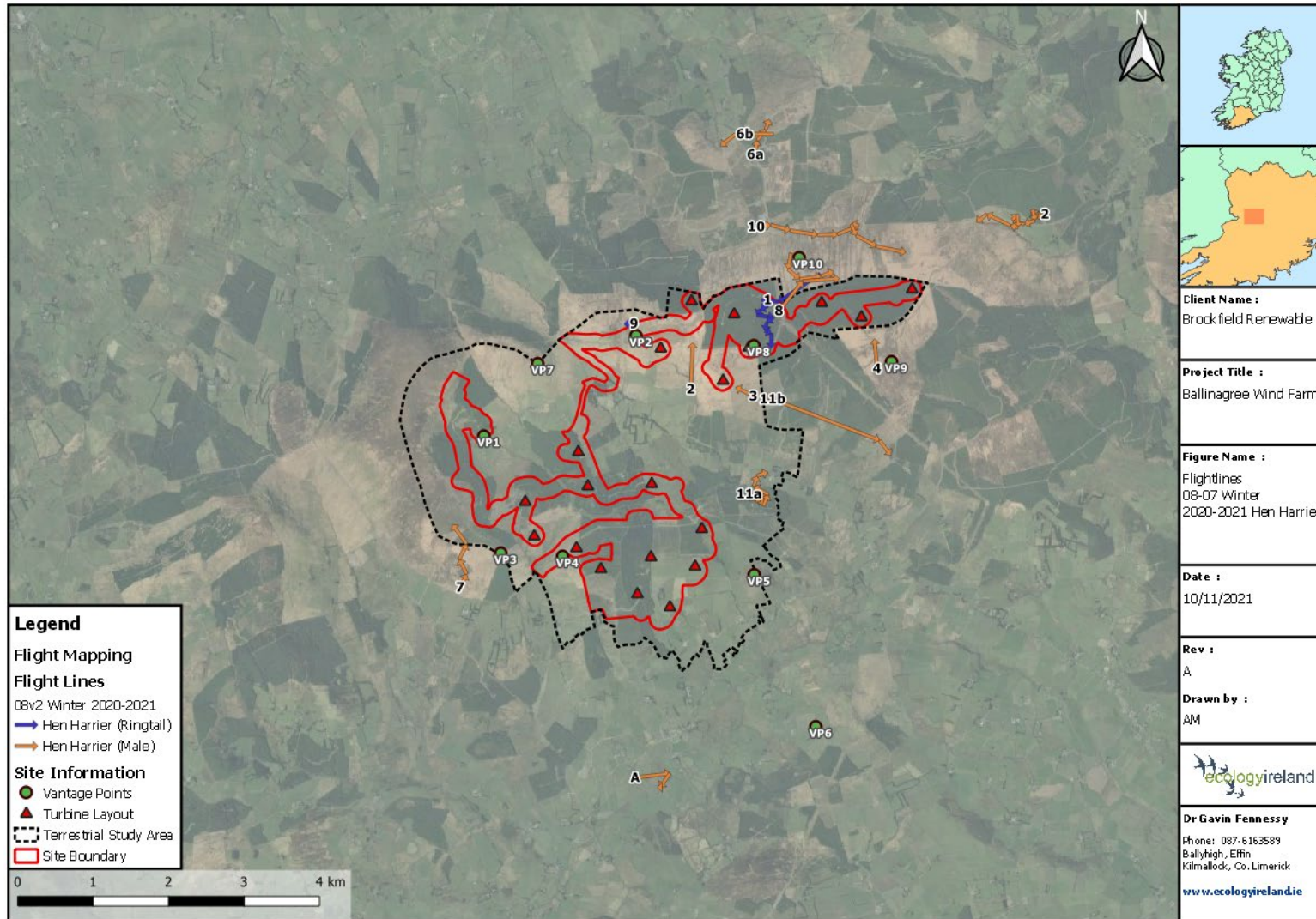


Figure 44 Winter 2020-2021 Peregrine

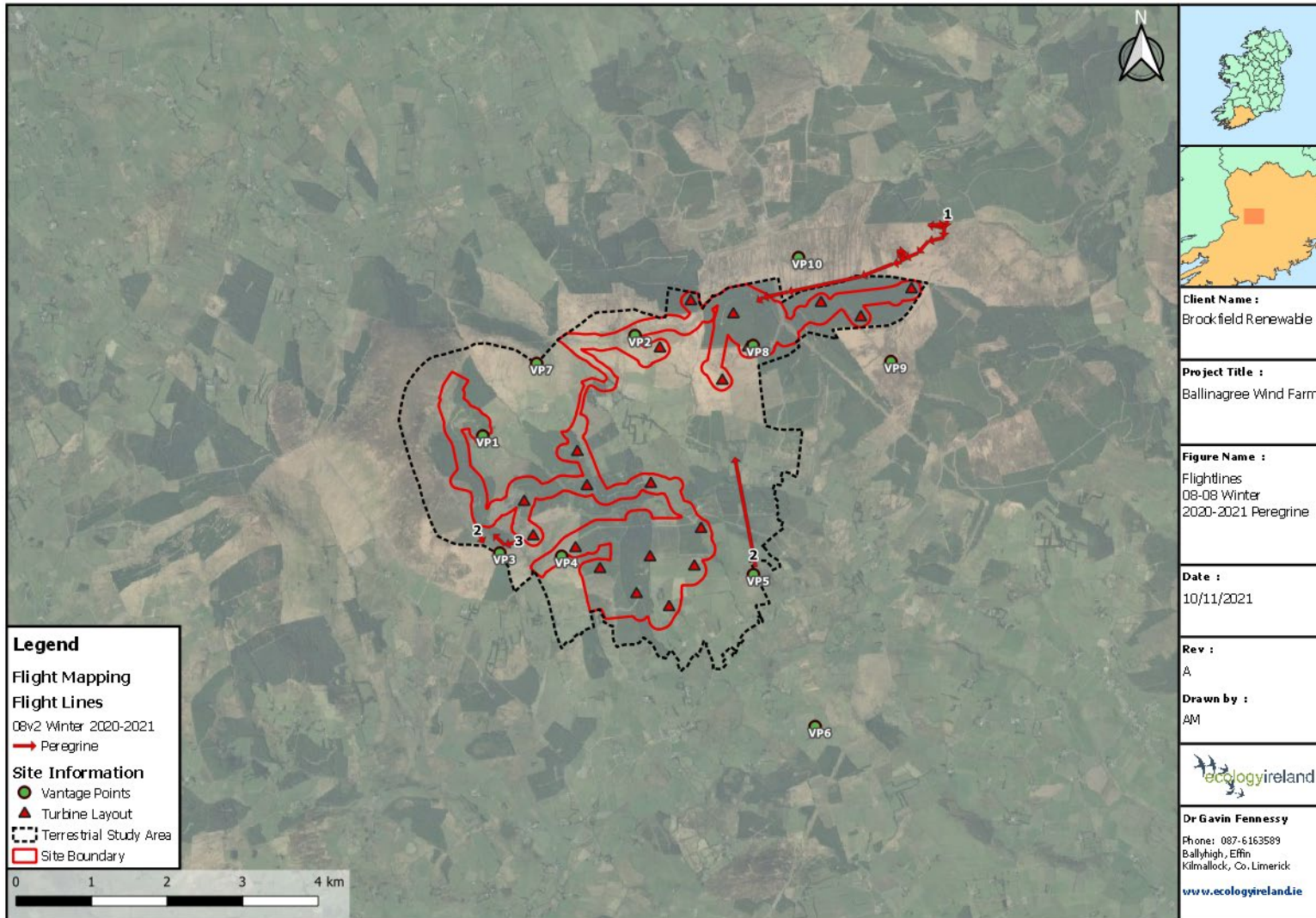
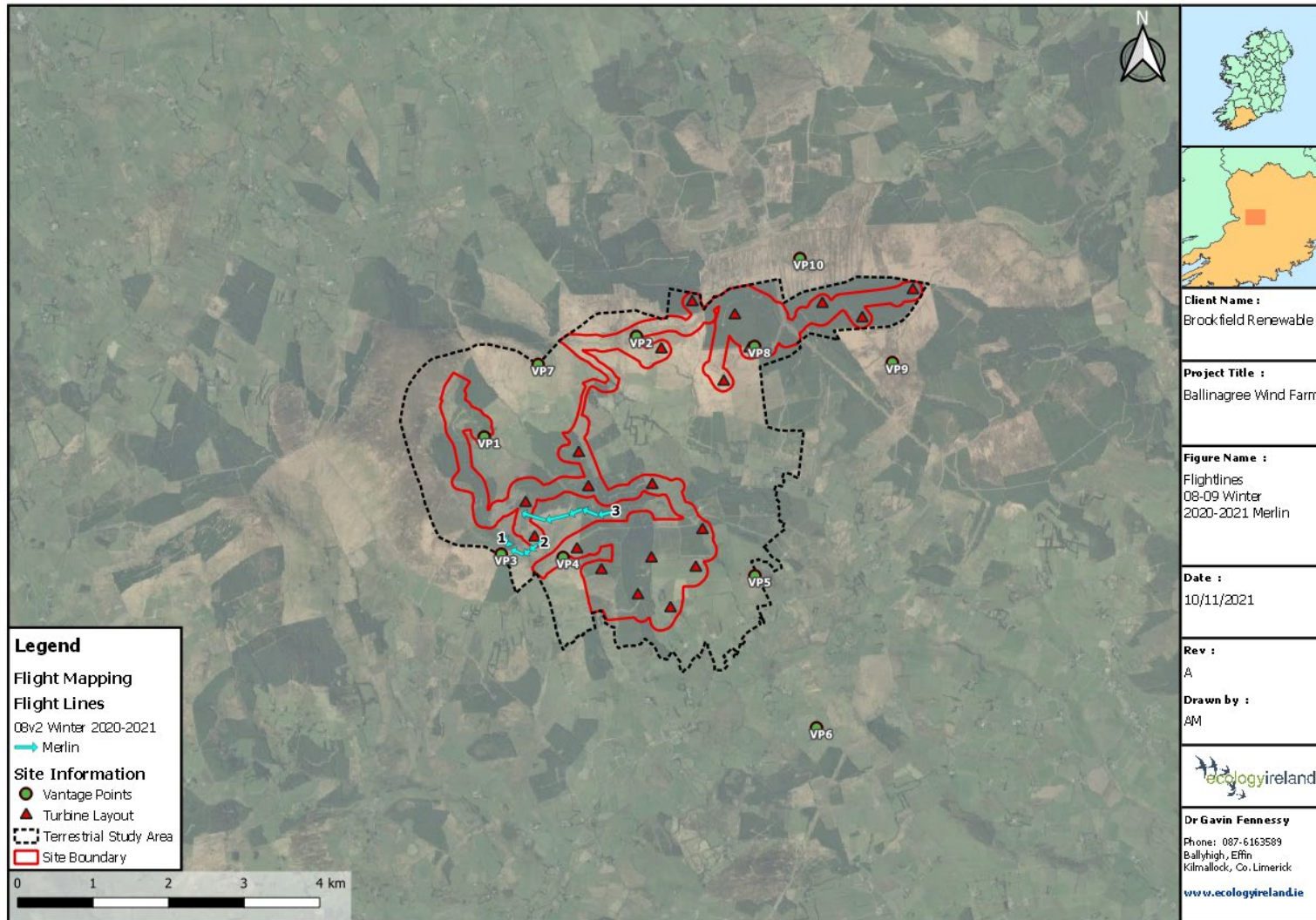


Figure 45 Winter 2020-2021 Merlin



Appendix 8A.6
General Bird Transect and Point Count Results

Breeding Season Survey Results 2017

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	4	6
Blackcap	<i>Sylvia atricapilla</i>	3	2
Blue Tit	<i>Cyanistes caeruleus</i>	0	1
Bullfinch	<i>Pyrrhula pyrrhula</i>	1	1
Chaffinch	<i>Fringilla coelebs</i>	13	9
Chiffchaff	<i>Phylloscopus collybita</i>	1	2
Coal Tit	<i>Parus ater</i>	2	5
Dunnock	<i>Prunella modularis</i>	1	2
Goldcrest	<i>Regulus regulus</i>	5	3
Grasshopper Warbler	<i>Locustrella naevia</i>	1	0
Greenfinch	<i>Carduelis chloris</i>	1	2
Hen Harrier	<i>Circus cyaneus</i>	1	0
Hooded Crow	<i>Corvus cornix</i>	9	3
House Martin	<i>Delichon urbica</i>	2	0
Kestrel	<i>Falco tinnunculus</i>	1	0
Lesser Redpoll	<i>Carduelis cabaret</i>	2	0
Magpie	<i>Pica pica</i>	1	1
Meadow Pipit	<i>Anthus pratensis</i>	9	0
Pheasant	<i>Phasianus colchicus</i>	1	3
Pied Wagtail	<i>Motacilla alba</i>	2	0
Robin	<i>Erithacus rubecula</i>	9	10
Rook	<i>Corvus frugilegus</i>	0	1
Siskin	<i>Carduelis spinus</i>	2	0
Skylark	<i>Alauda arvensis</i>	5	0
Song Thrush	<i>Turdus philomelos</i>	3	1
Starling	<i>Sturnus vulgaris</i>	5	0
Stonechat	<i>Saxicola torquata</i>	1	0
Swallow	<i>Hirundo rustica</i>	2	0
Willow Warbler	<i>Phylloscopus trochilus</i>	8	12
Woodpigeon	<i>Columba palumbus</i>	6	5
Wren	<i>Troglodytes troglodytes</i>	11	11

Breeding Season Survey Results 2018

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	2	2
Blackcap	<i>Sylvia atricapilla</i>	0	4
Blue Tit	<i>Cyanistes caeruleus</i>	1	2
Chaffinch	<i>Fringilla coelebs</i>	4	7
Chiffchaff	<i>Phylloscopus collybita</i>	1	2
Coal Tit	<i>Parus ater</i>	2	5
Crossbill	<i>Loxia curvirostra</i>	1	0
Dunnock	<i>Prunella modularis</i>	2	0
Goldcrest	<i>Regulus regulus</i>	0	2
Grasshopper Warbler	<i>Locustrella naevia</i>	0	1
Great Tit	<i>Parus major</i>	1	0
Greenfinch	<i>Carduelis chloris</i>	1	1
Hooded Crow	<i>Corvus cornix</i>	2	2
Jackdaw	<i>Corvus monedula</i>	2	50
Lesser Redpoll	<i>Carduelis cabaret</i>	4	2
Magpie	<i>Pica pica</i>	1	3
Meadow Pipit	<i>Anthus pratensis</i>	6	0
Pheasant	<i>Phasianus colchicus</i>	3	1
Pied Wagtail	<i>Motacilla alba</i>	1	0
Raven	<i>Corvus corax</i>	2	0
Reed Bunting	<i>Emberiza schoeniclus</i>	0	1
Robin	<i>Erithacus rubecula</i>	6	8
Rook	<i>Corvus frugilegus</i>	2	0
Siskin	<i>Carduelis spinus</i>	0	2
Skylark	<i>Alauda arvensis</i>	5	0
Song Thrush	<i>Turdus philomelos</i>	3	0
Stonechat	<i>Saxicola torquata</i>	1	0
Swallow	<i>Hirundo rustica</i>	1	0
Whitethroat	<i>Phylloscopus trochilus</i>	1	1
Willow Warbler	<i>Phylloscopus trochilus</i>	7	8
Woodpigeon	<i>Columba palumbus</i>	4	6
Wren	<i>Troglodytes troglodytes</i>	14	9

Breeding Season Survey Results 2019

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	6	5
Blackcap	<i>Sylvia atricapilla</i>	2	5
Blue Tit	<i>Cyanistes caeruleus</i>	2	0
Chaffinch	<i>Fringilla coelebs</i>	17	19
Chiffchaff	<i>Phylloscopus collybita</i>	1	3
Coal Tit	<i>Parus ater</i>	2	4
Dunnock	<i>Prunella modularis</i>	1	1
Goldcrest	<i>Regulus regulus</i>	4	7
Grasshopper Warbler	<i>Locustrella naevia</i>	0	1
Great Tit	<i>Parus major</i>	1	1
Hooded Crow	<i>Corvus cornix</i>	14	3
Jackdaw	<i>Corvus monedula</i>	6	0
Jay	<i>Garrulus glandarius</i>	0	1
Lesser Redpoll	<i>Carduelis cabaret</i>	0	2
Magpie	<i>Pica pica</i>	4	1
Meadow Pipit	<i>Anthus pratensis</i>	22	0
Mistle Thrush	<i>Turdus viscivorus</i>	1	0
Pheasant	<i>Phasianus colchicus</i>	1	1
Pied Wagtail	<i>Motacilla alba</i>	2	0
Raven	<i>Corvus corax</i>	8	2
Reed Bunting	<i>Emberiza schoeniclus</i>	1	0
Robin	<i>Erithacus rubecula</i>	5	9
Rook	<i>Corvus frugilegus</i>	26	0
Siskin	<i>Carduelis spinus</i>	1	0
Skylark	<i>Alauda arvensis</i>	11	0
Song Thrush	<i>Turdus philomelos</i>	1	1
Swallow	<i>Hirundo rustica</i>	5	0
Whitethroat	<i>Phylloscopus trochilus</i>	0	1
Willow Warbler	<i>Phylloscopus trochilus</i>	4	12
Woodpigeon	<i>Columba palumbus</i>	38	1
Wren	<i>Troglodytes troglodytes</i>	9	14

Breeding Season Survey Results 2021

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	6	4
Blackcap	<i>Sylvia atricapilla</i>	2	2
Blue Tit	<i>Cyanistes caeruleus</i>	8	4
Bullfinch	<i>Pyrrhula pyrrhula</i>	2	1
Chaffinch	<i>Fringilla coelebs</i>	28	22
Chiffchaff	<i>Phylloscopus collybita</i>	3	6
Coal Tit	<i>Pariparus ater</i>	2	3
Crossbill	<i>Loxia curvirostra</i>	0	1
Dunnock	<i>Prunella modularis</i>	2	2
Goldcrest	<i>Regulus regulus</i>	14	6
Goldfinch	<i>Carduelis carduelis</i>	3	0
Grasshopper Warbler	<i>Locustrella naevia</i>	0	1
Great Tit	<i>Parus major</i>	0	2
Grey Heron	<i>Ardea cinerea</i>	1	0
Hooded Crow	<i>Corvus cornix</i>	14	2
House Martin	<i>Delichon urbica</i>	5	0
Jackdaw	<i>Corvus monedula</i>	6	1
Kestrel	<i>Falco tinnunculus</i>	1	0
Lesser Redpoll	<i>Carduelis cabaret</i>	5	2
Long-tailed Tit	<i>Aegithalos caudatus</i>	0	4
Magpie	<i>Pica pica</i>	6	4
Meadow Pipit	<i>Anthus pratensis</i>	42	7
Mistle Thrush	<i>Turdus viscivorus</i>	1	2
Pied Wagtail	<i>Motacilla alba</i>	2	1
Raven	<i>Corvus corax</i>	2	0
Robin	<i>Erithacus rubecula</i>	9	7
Rook	<i>Corvus frugilegus</i>	28	0
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	0	1
Siskin	<i>Carduelis spinus</i>	0	10
Skylark	<i>Alauda arvensis</i>	36	0
Song Thrush	<i>Turdus philomelos</i>	2	3
Spotted Flycatcher	<i>Muscicapa striata</i>	1	0
Starling	<i>Sturnus vulgaris</i>	5	0
Swallow	<i>Hirundo rustica</i>	11	1
Whitethroat	<i>Phylloscopus trochilus</i>	0	1
Willow Warbler	<i>Phylloscopus trochilus</i>	8	11
Woodpigeon	<i>Columba palumbus</i>	18	5
Wren	<i>Troglodytes troglodytes</i>	21	16

Winter Season Survey Results 2017/2018

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	3	2
Blue Tit	<i>Cyanistes caeruleus</i>	1	1
Bullfinch	<i>Pyrrhula pyrrhula</i>	0	3
Chaffinch	<i>Fringilla coelebs</i>	12	12
Coal Tit	<i>Parus ater</i>	5	4
Dunnock	<i>Prunella modularis</i>	1	2
Fieldfare	<i>Turdus pilaris</i>	70	0
Goldcrest	<i>Regulus regulus</i>	2	1
Great Tit	<i>Parus major</i>	0	1
Hooded Crow	<i>Corvus cornix</i>	8	1
Jackdaw	<i>Corvus monedula</i>	11	0
Lesser Redpoll	<i>Carduelis cabaret</i>	4	0
Magpie	<i>Pica pica</i>	4	2
Meadow Pipit	<i>Anthus pratensis</i>	8	0
Pheasant	<i>Phasianus colchicus</i>	1	1
Pied Wagtail	<i>Motacilla alba</i>	1	0
Raven	<i>Corvus corax</i>	19	2
Reed Bunting	<i>Emberiza schoeniclus</i>	0	1
Robin	<i>Erithacus rubecula</i>	8	10
Skylark	<i>Alauda arvensis</i>	2	0
Snipe	<i>Gallinago gallinago</i>	1	0
Song Thrush	<i>Turdus philomelos</i>	4	1
Sparrowhawk	<i>Accipiter nisus</i>	2	0
Starling	<i>Sturnus vulgaris</i>	120	0
Woodpigeon	<i>Columba palumbus</i>	3	1
Wren	<i>Troglodytes troglodytes</i>	5	4

Winter Season Survey Results 2019/2020

Species Name	Scientific Name	Max Abundance Transects	Max Abundance Point Counts
Blackbird	<i>Turdus merula</i>	12	2
Blue Tit	<i>Cyanistes caeruleus</i>	12	4
Chaffinch	<i>Fringilla coelebs</i>	25	12
Coal Tit	<i>Periparus ater</i>	10	5
Crossbill	<i>Loxia curvirostra</i>	1	2
Dunnock	<i>Prunella modularis</i>	4	3
Fieldfare	<i>Turdus pilaris</i>	80	0
Goldcrest	<i>Regulus regulus</i>	12	8
Goldfinch	<i>Carduelis carduelis</i>	18	0
Great Tit	<i>Parus major</i>	2	1
Hooded Crow	<i>Corvus cornix</i>	55	7
Jackdaw	<i>Corvus monedula</i>	17	3
Jay	<i>Garrulus glandarius</i>	1	0
Kestrel	<i>Falco tinnunculus</i>	0	1
Lesser Redpoll	<i>Carduelis cabaret</i>	3	1
Magpie	<i>Pica pica</i>	5	3
Mallard	<i>Anas platyrhynchos</i>	2	0
Meadow Pipit	<i>Anthus pratensis</i>	97	4
Pied Wagtail	<i>Motacilla alba</i>	2	1
Raven	<i>Corvus corax</i>	13	0
Redwing	<i>Turdus iliacus</i>	41	0
Reed Bunting	<i>Emberiza schoeniclus</i>	1	0
Robin	<i>Erithacus rubecula</i>	18	18
Rook	<i>Corvus frugilegus</i>	30	1
Siskin	<i>Carduelis spinus</i>	4	13
Snipe	<i>Gallinago gallinago</i>	4	0
Song Thrush	<i>Turdus philomelos</i>	1	0
Starling	<i>Sturnus vulgaris</i>	61	0
Woodpigeon	<i>Columba palumbus</i>	48	0
Wren	<i>Troglodytes troglodytes</i>	7	10

Appendix 8A.7
Non Volant Mammals Survey Results

Species	C M 1	C M 2	C M 3	C M 4	C M 5	C M 6	C M 7	C M 8	C M 9	C M 10	C M 11	C M 12	C M 13	C M 14	C M 15	C M 16	C M 17	C M 18	C M 19	C M 20	C M 21	C M 22	C M 23	C M 24	C M 25	C M 26	C M 27	C M 28	C M 29	C M 30	C M 31	C M 32	C M 33	C M 34	C M 35									
Dunnoch																																						2						
<i>Others</i>																																												
Cattle			P									P																	P															
Sheep											P			P	P	P													P			P								P				

Appendix 8A.8
Planning Phase Invasive Species Management Plan

1 Options for control and eradication of Invasive Species

The best available methods of control and eradication were compiled with reference to the NRA Guidelines (2010) and Fennell et al. (2018) and are summarised in this section of the report. It is recommended that a suitably experienced contractor is employed to undertake the invasive species eradication programme at the site. Methods of invasive species control are rapidly evolving, based on new research and the availability and use of chemical agents. It is important in the preparation of any invasive species management plan to highlight the need for the plan to be reviewed and adapted in the context of any changes that occur in guidance or legislation in the period between pre-planning surveys and the implementation of controls.

The approved contractor will finalise this management plan, based on contemporary experience and knowledge, and on the prevailing level of infestation of each invasive species. A pre-treatment survey will be carried out to ground-truth the extent of each invasive species and to confirm that the recommended approach herein remains appropriate. For example, manual control may only work for small, new infestations such as young Butterfly bush shrubs, but a combination of manual and chemical control may be required to ensure the complete eradication of more established shrubs. The specialist contractor will advise/finalise the best approach based on their knowledge of the species in question.

The successful eradication of invasive species from the development site may require some discussion and co-operation with neighbouring landholdings/landowners and as such the management plan will be discussed and (if possible) agreed with any relevant parties.

1.1 Management Options for Eradication of Invasive Species

Japanese Knotweed (*Fallopia japonica*) and Rhododendron (*Rhododendron ponticum*) were the only invasive plant species recorded within and outside of overall wind farm study area that are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place). Vector materials; soil and/or spoil taken from affected sites are also included under Regulations 49 and 50 for this species. While neither species was recorded within the construction footprint it is possible that these, or indeed other, invasive plant species could become established within the working area.

The developer will ensure through their appointed contractor that the Invasive Species Management plan is reviewed by suitably qualified and experienced specialist contractors ahead of any site mobilisation. Due to the high risk posed by this species, the location of Japanese Knotweed and Rhododendron stands will be clearly marked and cordoned off ahead of any site works. Any additional Third Schedule species present will also be recorded and mapped. The location and sensitivity of these locations will be covered in the initial induction with all site staff prior to construction works.

All site staff will be made aware of the existence of this Management Plan and where it will be available for review on-site.

Where excavations or earth works associated with the construction phase are located within 7 metres of an identified Japanese knotweed stand, the excavation material will be treated as potentially contaminated material, by a licensed contractor to a suitably licensed waste facility. The potential for impacting upon any Rhododendron found within the planned working area will be assessed by a suitably qualified specialist. These locations will be marked and access to such areas will be restricted to necessary personnel (e.g. invasive species specialists). Excavations in these areas will be monitored by a suitably qualified ecologist with experience in invasive species control and management.

The specialist invasive species management contractor employed to undertake invasive plant eradication and removal will review and if necessary, update/amend the suggested management provided in this report. They will have responsibility for ensuring that the adopted approach follows the best contemporary guidance and is fully legally compliant.

Details of management options for invasive plant species noted during surveys of the wider area and which are therefore most likely to be encountered during the construction phase are provided in the following sections.

1.2 Management and Control Options for Japanese Knotweed

Management/Eradication options for Japanese Knotweed (after NRA 2010, Fennell *et al.* 2018) to include;

Management options for Japanese Knotweed (TBC by approved contractor) to include:	
Initial Site Staff Induction	<p>An initial induction with all site staff will be undertaken prior to construction works starting, to inform them of the occurrence in the area of Japanese Knotweed, including issues caused by its spread, identification and site walkover of known location(s) – ensuring clearing of footwear, equipment etc. prior to leaving infested area – <i>i.e.</i> PLAN, CHECK, CLEAN & DRY (Fennell <i>et al.</i> 2018)</p> <p>All site staff will be made aware of the existence of the Management Plan and where it will be available for review as required, the proposed management options appropriate for the site, and the name of the contractor appointed for invasive species management and removal where applicable.</p>
Japanese Knotweed - Brief Description	<p>Japanese Knotweed is a robust, herbaceous perennial with hollow, bamboo like stems which are green with red spots in summer before turning brown in winter. The plant has yellow/cream flowers in later June or August. Its leaves are arranged in a zig-zag pattern alongside shoots arising from the main stem (NRA 2010).</p>
Pathways of spread	<p>Only female plants have been recorded in Ireland and while seeds are sometimes produced, these are hybrid and rarely survive. Dispersal typically occurs through rhizome fragments, crown fragments, rhizomes, and in certain cases from the stem fragments, usually by being transported in soil by humans or to a lesser extent, through passive mechanical means such as in floodwaters. Dispersal is also achieved through vegetative reproduction from plant fragments (NRA 2010, Fennell <i>et al.</i> 2018).</p>
Prevention	<p>Immediate action: Minimise or avoid contact with plants and infested substrate. Fence off and mark clearly where possible.</p> <p>Plan, Check, Clean and Dry - Always clean footwear, clothing and equipment immediately on leaving the infested area.</p>
Note:	<p>It is a requirement of this plan that only personnel with sufficient training, experience and knowledge in the control of non-native invasive species should be employed to assist in the planning and implementation of control measures in relation to Japanese knotweed which should be undertaken with reference to the current guidance (e.g. UK Environment Agency's (n.d.) <i>Managing Japanese knotweed on development sites - the knotweed code of practice</i> (NRA 2010).</p> <p>The primary objective of control should be <u>total eradication</u> by targeting the underground rhizome and not simply the aerial parts. <i>It should be noted that none of the methods outlined below guarantee eradication.</i></p> <p>Any removal from site must be in line with current waste regulations.</p> <p>The methodology used may depend upon whether immediate removal is required or if it is enough to control/eradicate the stands over a period of time. In the event that immediate removal is deemed necessary (<i>i.e.</i> prevent the risk of spread during construction works at the site) then actions 1 to 5 below will be considered. In the event that immediate removal is not required (<i>i.e.</i> there is no risk of spread during construction and it is considered feasible to eradicate over time) action 8; herbicide</p>

Management options for Japanese Knotweed (TBC by approved contractor) to include:		
	applications will be scheduled. For more information on determining the best approach to take see Fennell <i>et al.</i> 2018.	
	Personnel Responsible: TBC on appointment of contractor	Date to Undertake: TBC on appointment of contractor
Approved methodologies to be implemented for this site (to be reviewed and if necessary, amended by approved specialist contractor):	Methods to be Undertaken: TBC on appointment of contractor with reference to 1 to 7 below and in line with most current guidelines and regulations). At present our recommended approach favours Measure 1.	Date to be Undertaken: TBC on appointment of contractor – specialist invasive species management specialists to have reviewed and finalised management measures and any necessary work (e.g. pre-works survey and isolation of areas with invasive plants) carried out ahead of any other site mobilisation.
Methodologies available for consideration in finalising eradication programme:		
1. Avoidance	Advantages: No risk of indirect disturbance or consequent spread as a result of excavations works or works with machinery in the vicinity of the Japanese knotweed stand.	Disadvantages: Potential for inadvertent disturbance of Japanese knotweed populations in proximity to proposed works, associated with the movement, storage or operation of machinery or construction activity.
2. Hand Excavation: small stands	Advantages: Can be effective for newly established plants.	Disadvantages: As the rhizome becomes more established hand excavation becomes impractical.
3. Physical cutting:	Advantages: Long term can weaken the plant rhizome, but this would take many years to achieve eradication.	Disadvantages: Labour intensive. Not effective as new stems will continually regrow. Unlikely to result in lasting control. Due to the potential to spread from small rhizome fragments, disposal of material should be undertaken with due caution to prevent accidental spread of the plant.
4. Excavation: larger stands	Will achieve immediate results and with due care all rhizomes can be successfully removed	Can revive and regrow if any rhizome is overlooked. Process is expensive. Disposal of material should be undertaken with due caution to prevent accidental spread of the plant.
5. Burial:	Achieves immediate results without the need for landfill disposal	Contains rather than eradicates. Only suitable for certain sites. Location of burial site should be retained on land deeds to prevent risk of future disturbance. The number of years for material to become unviable is

Management options for Japanese Knotweed (TBC by approved contractor) to include:				
			undocumented but has been suggested at 20 years	
6. Removal off-site:	Achieves immediate removal and leaves no restrictions on site		Expensive and will result in the removal of viable site soil. Removal to approved licensed disposal facility only	
7. Chemical/Herbicide Treatment:	<p>Effective and efficient control can be achieved with the use of Glyphosate which is less labour intensive than methods outlined above.</p> <p>Requires ongoing/repeated treatments, which can have negative impact on the receiving environment and other non-target species. Treatment near a watercourse requires approval. Overdosing can lead to plant dormancy rather than eradication and as such care is required in applications.</p> <p>NOTE: it is an offence to use Plant Protection Products in a manner other than specified on the label and in accordance with the product label and with Good Plant Protection Practice as prescribed in the EU - (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003).</p>			
Herbicide Treatment Methods	Herbicide	Timing	Number of treatments	
Foliage application	Glyphosate	Autumn is the most effective time for treatment	Ongoing/several treatments will be required. Up to 5 years has been required in instances where plants are well established.	
Weed-wiping	Glyphosate	Effective in some cases.	Ongoing/several treatments will be required. Up to 5 years has been required in instances where plants are well established.	
Stem injection	Glyphosate	Late summer to autumn is most effective time for treatment of stems	Only one or two treatments may be feasible as stems need to be of required thickness (greater than 8mm). Where regrowth occurs additional foliage application will be required.	
Ongoing monitoring and evaluation of success of eradication programme				
Ongoing Monitoring and Evaluation	Personnel Responsible:	Dates to be undertaken by:	Reporting To:	Status / Are
Of success of eradication programme	TBC on appointment of contractor	TBC on appointment of contractor	TBC on appointment of contractor	Additional Treatments Required (if so give dates): TBC on appointment of contractor

1.3 Management and Control Options for Rhododendron

Management/Eradication options for *Rhododendron ponticum* (after NRA 2010, Fennell *et al.* 2018) to include;

Management options for Rhododendron (TBC by approved contractor) to include:	
Initial Site Staff Induction	<p>An initial induction with all site staff will be undertaken prior to construction works starting, to inform them of the occurrence in the area of Rhododendron, including issues caused by its spread, identification and site walkover of known location(s) – ensuring clearing of footwear, equipment etc. prior to leaving infested area – <i>i.e.</i> PLAN, CHECK, CLEAN & DRY (Fennell <i>et al.</i> 2018)</p> <p>All site staff will be made aware of the existence of the Management Plan and where it will be available for review as required, the proposed management options appropriate for the site, and the name of the contractor appointed for invasive species management and removal where applicable.</p>
Rhododendron ponticum - Brief Description	<p>Rhododendron ponticum is an evergreen shallow-rooted shrub often reach 4-5m in height – even taller in some cases. The stems are light brown and woody and become trunk-like with age. Early summer prouces lilac, pink, or purple flowers. Seed pods disperse thousands of seed in late winter. Forms dense ‘forest’ spreading rapidly and shading the understorey.</p>
Pathways of spread	<p>Primarily reproduces by seeds, distributed by wind, water, animals and in topsoil. Can also regenerate from small rhizome fragments and stem layering. Seeds are produced when the plant reaches maturity – 10-12 years.</p>
Prevention	<p>Immediate action: Minimise or avoid contact with plants and infested substrate. Fence off and mark clearly where possible.</p> <p>Plan, Check, Clean and Dry - Always clean footwear, clothing and equipment immediately on leaving the infested area.</p>
Note:	<p>It is a requirement of this plan that only personnel with sufficient training, experience and knowledge in the control of non-native invasive species should be employed to assist in the planning and implementation of control measures in relation to Rhododendron which should be undertaken with reference to the current guidance.</p> <p>The primary objective of control should be <u>total eradication</u> by targeting the underground rhizome and not simply the aerial parts. Labour intensive to remove but easier to achieve eradication than with (say) Japanese Knotweed. Young plants should be removed wherever possible before they reach maturity and can produce seed.</p> <p>Any removal from site must be in line with current waste regulations.</p> <p>The methodology used may depend upon whether immediate removal is required or if it is enough to control/eradicate the stands of Rhododendron over a period of time. For small shrubs or seedlings hand-pulling is effective but for medium and large shrubs the control options include mechanical flail cutting/mulching, excavation and herbicide application. For more information on determining the best approach to take see Fennell <i>et al.</i> 2018.</p>

Management options for Rhododendron (TBC by approved contractor) to include:		
	Personnel Responsible: TBC on appointment of contractor	Date to Undertake: TBC on appointment of contractor
Approved methodologies to be implemented for this site (to be reviewed and if necessary, amended by approved specialist contractor):	Methods to be Undertaken: TBC on appointment of contractor with reference to 1 to 3 below and in line with most current guidelines and regulations). At present our recommended approach favours Measure 1 for small shrubs and seedlings. For areas that can be disturbed Method 2 (& 3) is preferred and in areas that cannot be disturbed method 3 is the preferred control option.	Date to be Undertaken: TBC on appointment of contractor – specialist invasive species management specialists to have reviewed and finalised management measures and any necessary work (e.g. pre-works survey and isolation of areas with invasive plants) carried out ahead of any other site mobilisation.
Methodologies available for consideration in finalising eradication programme:		
1. Manual – hand pulling, uprooting	Advantages: Recently established plants can be easily uprooted. Small shrub bushes are shallow rooted and can be uprooted using a Lever and Mulch technique. The method has minimal effect on the environment and it effectively prevents flowering and seed dispersal.	Disadvantages: Labour intensive and plant material needs to be disposed of appropriately. Does not remove the seed bank or mature specimens. Can regrow from remaining root fragments.
2. Physical cutting: flailing/mulching/excavation (specialised equipment)	Advantages: Highly effective if carried out in conjunction with herbicide treatment to stumps and regrowth. Relatively quick. Works can be undertaken in the growing season (subject to other ecological constraints).	Disadvantages: Can be expensive and specialist work. Arisings need to be disposed of appropriately. Cut material can obscure stumps. Mulched roots can regrow if not treated with herbicide. Plant/leaf vegetation can be toxic and hostile for revegetation by native plants.
3. Herbicide application	Advantages: Cost effective. Foliar spray appropriate for seedlings and small/cut shrubs. Stem treatment effective on larger specimens. NOTE: it is an offence to use Plant Protection Products in a manner other than specified on the label and in accordance with the product label and with Good Plant Protection Practice as prescribed in the EU - (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003).	Disadvantages: Can have a negative environmental effect and impact non-target species. Cut stump treatment has less potential for environmental impact.

Management options for Rhododendron (TBC by approved contractor) to include:

Management options for Rhododendron (TBC by approved contractor) to include:			
Herbicide Treatment Methods	Herbicide		Timing
Foliage application	Glyphosate with Topfilm or Mixture B		Best applied during the growing season.
Cut-stump	Glyphosate	Highly effective year round.	One treatment often sufficient.
Ongoing monitoring and evaluation of success of eradication programme			
Ongoing Monitoring and Evaluation of success of eradication programme	Personnel Responsible: TBC on appointment of contractor	Dates to be undertaken by: TBC on appointment of contractor	Where regrowth occurs additional intervention may be required.