

2021

Hollandmey Renewable Energy Development

Technical Appendix 9.1: Ornithology Technical Report

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November 2021

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Introduction

- 1.1. This report details the ornithological survey work undertaken at the Site of the proposed Hollandmey Renewable Energy Development (hereafter referred to as the 'proposed Development') by Natural Research (Projects) Ltd (NRP) between June 2017 and August 2021. A minimum of two breeding seasons and two non-breeding seasons have been covered.
- 1.2. The objectives of the study were to:
 - ◆ Map the distribution of breeding birds, including scarce breeding species listed in Annex 1 of the EU Birds Directive (2009/147/EEC) on the Conservation of Wild Birds 1979 (the Birds Directive) or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA);
 - ◆ Quantify the level of bird flight activity by breeding, wintering and foraging birds of potential conservation importance; and
 - ◆ Record the presence and abundance of other birds of conservation importance (those listed in Biodiversity Action Plans (BAPs) or on the Red List of Birds of Conservation Concern (BoCC) (Eaton *et al.*, 2015) throughout the survey period.
- 1.3. This report is supported by **Confidential Technical Appendix 9.3**.

Desk Study

- 1.4. The Site is adjacent to the Stroupster Peatlands Site of Special Scientific Interest (SSSI), a component of the Caithness and Sutherland Peatlands Special Protection Area (SPA) (**Figure 9.1.1: Ornithological designations**). The Caithness and Sutherland Peatlands SPA is classified for its breeding populations of black-throated diver (*Gavia arctica*), red-throated diver (*Gavia stellata*), common scoter (*Melanitta nigra*), wigeon (*Anas penelope*), golden eagle (*Aquila chrysaetos*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), short-eared owl (*Asio flammeus*), golden plover (*Pluvialis apricaria*), wood sandpiper (*Tringa glareola*), greenshank (*Tringa nebularia*) and dunlin (*Calidris alpina*). All of these features are described as being in Favourable condition with the exception of common scoter which is described as being in Unfavourable Declining condition and short-eared owl which has not been assessed.
- 1.5. Loch of Mey SSSI, which is a constituent of the Caithness Lochs SPA and Ramsar site, is located 1.5 km from the Site, and Loch of Heilen SSSI, also part of the Caithness Lochs SPA, is 2 km from the Site (**Figure 9.1.1: Ornithological designations**). The Caithness Lochs SPA is classified for its wintering populations of whooper swan (*Cygnus cygnus*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and greylag goose (*Anser anser*) all of which are described as being in "Favourable" condition.

Study Areas and Survey Periods

- 1.6. The study area for ornithological surveys relevant to the proposed Development is situated in an area of commercial forestry, agricultural fields, rough grazing and moorland (**Figure 9.1.2: Survey locations 2017 to 2020**).
- 1.7. Some birds range over large areas and are therefore potentially vulnerable to the effects of windfarm developments a considerable distance away. Hence the ornithological study area encompassed a series of survey boundaries extending up to 2 km from the initial Site. These boundaries defined the study area for surveys of certain species or for a particular survey method i.e., 500 m for flight activity, for breeding passerines and waders, and for wintering birds; 1 km for breeding barn owl; 2 km for skuas, breeding raptors and short-eared owl (**Figure 9.1.2: Survey locations 2017 to 2020**). Surveys were also undertaken within the surrounding area to record the likely feeding locations of geese and swans. Surveys were carried out within these boundaries between June 2017 and August 2021 with the main survey period from March 2018 to March 2020.
- 1.8. In August 2020 an additional area was incorporated into the Site and between April and August 2021 additional Breeding Birds of Open Ground Surveys and Scarce Breeding Bird Surveys were carried out in this new area and its associated survey buffers (**Figure 9.1.3: Additional survey locations 2021**). The two vantage points used for the flight activity surveys gave good coverage of this additional area and therefore no further flight activity surveys were necessary.
- 1.9. In order to report fully on the results of the surveys, the data collected within both sets of survey boundaries have been incorporated and buffers of the turbines and infrastructure of the proposed Development created, where these data have been displayed by way of interpretation (**Figure 9.1.4: Reporting buffers**).

Field Survey Methods

- 1.10. All surveyors are very familiar with the area and the species likely to occur there and have worked on similar projects in Caithness. Field surveyors completed survey work with emphasis placed on the importance of carrying out surveys in a systematic and standardised way to enable direct comparison of data from different survey periods and sites

Flight Activity

- 1.11. Information on bird flight activity was collected during timed watches from strategic Generic Vantage Points (GVPs) using the methods described by Band *et al.* (2007). GVPs were selected through a mix of Geographic Information System (GIS) analysis and field trials, with the aim of maximising ground visibility within the 500 m flight activity survey area using the minimum number of vantage points (**Figure 9.1.5: Vantage points and visibility**).

1.12. Two vantage point locations were used (**Table 9.1.1**). The visibility from each GVP drawn at 20 m elevation above the ground was derived using a GIS. (**Table 9.1.2, Figure 9.1.5: Vantage points and visibility**)

1.13. In order to select flights for potential inclusion in a Collision Risk Model (CRM) (Band *et al.*, 2007), flight activity data were extracted and reported in respect of a 500 m buffer around a polygon formed by the outermost of the ten turbine locations of the proposed Development. This area is termed the Flight Activity Assessment Area (FA). The FA measures 653 ha and the two GVPs provided 92% cover of the FA.

Table 9.1.1. GVP locations and area visible (km²) within the 500 m buffer of the proposed turbines (FA).

GVP No.	Grid reference	Dates GVP utilised	Area visible (ha) within 500 m buffer (2 km cut-off)	Area of 500 m buffer (ha)	Combined GVP visible area (ha)
1	ND 29194 70865	April 2018 to March 2020	374.5	653.4	600.7
2	ND 29665 69387	April 2018 to March 2020	320.2		
Total					

1.14. Observers at GVPs positioned themselves to minimise their effects on bird behaviour. A viewing arc not exceeding 180° was scanned. Watches were undertaken during daylight hours by a single observer in a wide range of weather conditions, mainly in conditions of good ground visibility (>2 km) and when the cloud base was higher than most elevated parts of the survey area.

1.15. A minimum of 36 hours of observation has been completed from each GVP for each period of each year (April to August classed as the breeding period and September to March classed as the non-breeding period) (**Tables 9.1.2a & 9.1.2b**). In total 288 hours of observation has been undertaken with 144 hours during the breeding season and 144 hours in the non-breeding season.

1.16. When possible, observations were stratified across three daylight periods (termed 'early', 'middle' and 'late') to allow for diurnal variation in activity rates. The timing of watches within each period was adjusted each month in accordance with sunrise and sunset times (**Annex 9.1.1**). A wide range of weather conditions were sampled including rain showers, cloud cover from 0 to 100 % and wind speeds up to Beaufort Force 7 (**Annex 9.1.3**).

Table 9.1.2a. Summary of monthly GVP effort in Year 1 2018 to 2019 (data are hours of observation).

GVP No.	Breeding						Non-Breeding											
	2018														2019			
	Apr	May	Jun	Jul	Aug	Total	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total				
1	8.00	8.00	8.00	6.00	6.00	36.00	6.00	6.00	5.00	4.00	4.00	5.00	6.00	36.00				
2	8.00	8.00	8.00	6.00	6.00	36.00	6.00	6.00	5.00	4.00	4.00	5.00	6.00	36.00				

Table 9.1.2b. Summary of monthly GVP effort in Year 2 2019 to 2020 (data are hours of observation).

GVP No.	Breeding						Non-Breeding											
	2019														2020			
	Apr	May	Jun	Jul	Aug	Total	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total				
1	8.00	8.00	8.00	6.00	6.00	36.00	6.00	6.00	5.00	4.00	4.00	5.00	6.00	36.00				
2	8.00	8.00	8.00	6.00	6.00	36.00	6.00	6.00	5.00	4.00	4.00	5.00	6.00	36.00				

1.17. During each watch three hierarchical recording methods were used, as follows:

- Focal bird sampling – timed. The viewing arc was scanned constantly until a *Target A species*¹ was detected in flight. Once detected, the bird was followed until it ceased flying or was lost from view, with the duration of the flight recorded to the nearest second. The route followed by the bird was plotted in the field onto a 1:25,000 scale map, with the direction of flight indicated regardless of whether or not the bird was within the survey area. The bird's flying elevation above the ground was estimated at the point of detection and at 15 second intervals, thereafter, using a countdown timer with an audible alarm. Height bands to classify flying elevation were less than 10 m, 10 m to 30 m, 30 m to 50 m, 50m to 100 m, 100 m to 150 m and greater than 150 m. Where simultaneous flight activity by a number of birds was observed and it was not possible to plot individual flight lines, areas of flight activity were plotted on the field maps.
- Focal bird sampling – untimed. The same scanning procedure as described above was used. However, flights of *Target B species*² were not timed, instead the flight path was mapped and flying elevation was recorded at the start and when it changed during the recorded bout. Where a flock was observed a central flight line representative of the route was estimated.
- Activity Summaries. At the end of each five-minute period flight activity within the survey area by species of lesser conservation importance (*Target*

¹ *Target A* species were drawn from those listed in Annex 1 of the Birds Directive and Schedule 1 of the WCA. See Annex 9.1.6 for a full list.

² *Target B* species were migratory birds of conservation importance, in this instance geese and certain waders. See Annex 9.1.6 for a full list.

C species)³ was summarised. The number of birds recorded in any one period was the minimum number of individuals that could account for the activity observed. The height, direction and number of individuals involved in notable bird movements were recorded.

1.18. Data were entered in the field onto recording sheets and later transferred to Microsoft Excel spreadsheets. Maps of flight activity by Target Species were compiled for each watch. Each flying bout was numbered and cross-referenced to the relevant flight path on the map.

Flight Activity – Migratory Period Watches

1.19. Additional watches to record migratory movements of swans, geese and waders at a landscape scale were completed during both spring and autumn periods. One Migration Watch Point (MWP) was utilised with observers choosing the best position on the hilltop, along the 150 m between ND 29465 71089 and ND 29574 70977 (**Figure 9.1.2: Survey locations 2017 to 2020**). This location gave good broad spatial coverage of the Site in respect of birds moving on a predominantly north-south axis. Observations were made for 36 hours between March and May in both 2018 and 2019 (spring) and for 36 hours between September and November in both 2018 and 2019 (autumn) totalling 144 hours. (**Table 9.1.3a & 9.1.3b, Annex 9.1.4**). A range of weather conditions were sampled with an emphasis on days that were conducive to migration (**Annex 9.1.5**).

Table 9.1.3a. Summary of monthly MWP effort 2018 (data are hours of observation).								
MWP No.	2018			Total	2018			Total
	Mar	Apr	May		Sep	Oct	Nov	
1	9.00	21.00	6.00	36.00	12.00	18.00	6.00	36.00

Table 9.1.3b. Summary of monthly MWP effort 2019 (data are hours of observation).								
MWP No.	2019			Total	2019			Total
	Mar	Apr	May		Sep	Oct	Nov	
1	12.00	18.00	6.00	36.00	12.00	18.00	6.00	36.00

Scarce Breeding Birds

1.20. Priority was given to detecting the species considered, after inspection of the available habitats, most likely to breed in the area: osprey (*Pandion haliaetus*),

hen harrier, barn owl (*Tyto alba*), short-eared owl, merlin, golden plover and greenshank.

1.21. In addition to the survey effort on GVP watches and the Breeding Birds of Open Ground Surveys, a total of 112 hours were spent searching for evidence of Scarce Breeding Birds in 2018, 2019 and 2021 (**Table 9.1.4**).

1.22. Surveys were undertaken within suitable habitat which was located within the 2 km survey buffer for osprey, hen harrier, merlin and short-eared owl: and the 1 km survey buffer for barn owl and the 500 m buffer for golden plover and greenshank (**Figure 9.1.2: Survey Locations 2017-2020**). The area covered in 2021 was an additional area not covered in the 2018 and 2019 surveys (**Figure 9.1.3: Additional survey locations 2021**).

1.23. In some areas access permission was not gained for surveys on foot. In these areas, where possible, watches for activity were conducted from a suitable location overlooking these areas.

1.24. Any evidence of potential breeding was recorded including adults present in breeding habitat, territorial display, nest building, adults carrying prey items, active or recently used nests and fledged young. All activity and nest locations were marked on OS 1:25,000 maps with details of the sighting including age, sex and behaviour.

Osprey

1.25. Survey methods in Hardey *et al.* (2013) were followed. Emphasis was given to large, mature trees, particularly conifers that were prominent within the landscape and also known artificial nesting platforms. Watches were made over likely areas and any territorial activity recorded.

Hen harrier

1.26. Survey methods in Hardey *et al.* (2013) were followed, with emphasis given to any stands of tall heather with searches made for signs of occupancy and watches for territorial activity.

Barn owl

1.27. Survey methods based on Hardey *et al.* (2013) were followed. Systematic searches for potential nest and roost sites were undertaken. Emphasis was placed

³ See Annex 9.1.6

on searching for birds, nests, pellets, feathers and faecal splash in potentially suitable buildings within 1 km of the proposed Development.

Short-eared owl

- 1.28. Survey methods in Hardey *et al.* (2013) were followed. Emphasis was given to stands of tall heather and other rank vegetation, with searches made for signs of occupancy and watches for territorial activity.

Merlin

- 1.29. Survey methods in Hardey *et al.* (2013) were followed, with emphasis given to any stands of tall heather, boulders, hummocks, bushes and trees including old crows' nests (which could be re-used by merlin) were checked for signs of occupation (e.g., plucked prey, moulted feathers, pellets and faeces).

Table 9.1.4. Details of Scarce Breeding Birds surveys 2018, 2019 and 2021.											
Date	Start	Finish	Duration (hrs)	Observer.	Cloud Cover (10 ^{ths})	Cloud Base (m)	Wind Direction	Wind Force	Precipitation*	Visibility (km)	Target Spp.
17/04/18	1120	1420	3.00	NR	4	1000	SE	4	nil	20	HH ML
17/04/18	1445	1745	3.00	NR	3	1000	SE	5	nil	20	HH ML
24/04/18	1305	1445	1.67	NR	3	1000	W	4	nil	20	GK
24/04/18	1500	1630	1.50	NR	3	1000	W	4	nil	20	HH ML SE
08/05/18	1115	1415	3.00	JD	5	1000	S	3	nil	20	HH ML SE
17/05/18	1420	1550	1.50	JD	3	1000	NE	2	nil	15	HH ML SE
17/05/18	1600	1730	1.50	JD	3	1000	N	2	nil	15	HH ML SE
18/05/18	1000	1250	2.83	JD	7	1000	NE	3	nil	15	HH ML SE
25/05/18	1650	1850	2.00	JD	4	500	N	3	nil	15	HH ML SE
25/05/18	1900	2000	1.00	JD	9	500	N	2	nil	15	HH ML SE
11/06/18	1600	2200	6.00	JD	5	1000	N	2	nil	15	BO HH SE
11/07/18	1100	1700	6.00	JD	10	1000	NW	2	nil	15	HH ML SE
11/04/19	1030	1230	2.00	JD	10	1000	NE	1	nil	5	HH ML SE
11/04/19	1235	2030	7.92	JD	10	1000	NE	1	nil	5	HH ML SE
12/04/19	830	1030	2.00	PS	2	1000	SW	3	nil	10	HH ML SE
12/04/19	1100	1500	4.00	PS	6	1000	S	3	nil	10	HH ML SE
15/04/19	1530	1830	3.00	JD	10	1000	SE	3	nil	5	HH ML SE
02/05/19	1015	1615	6.00	PS	7	1000	ESE	3	nil	5	HH ML SE
14/05/19	1100	1500	4.00	JD	0	-	SE	1	nil	5	GK
14/05/19	1830	2030	2.00	JD	3	1000	SE	2	nil	5	HH ML SE
18/06/19	500	800	3.00	JD	10	1000	SW	1	nil	5	HH ML SE
30/06/19	1240	1410	1.50	PH	7	1000	SW	4	nil	3	HH ML SE
30/06/19	1430	1600	1.50	PH	7	1000	SW	4	nil	3	HH ML SE
15/07/19	1630	1930	3.00	PS	0	-	E	1	nil	5	HH BO
21/07/19	1630	2230	6.00	JD	3	1000	NW	2	nil	5	SE BO
22/07/19	2000	2300	3.00	JD	7	1000	SW	3	nil	5	SE BO
21/08/19	1230	1600	3.50	RAS	8	700	WSW	4	nil	5	HH ML
24/04/21	1230	1430	2.00	PH	4	1000	SE	2	nil	20	HH ML SE BO OP
30/04/21	830	1430	6.00	PH	5	1000	NW	3	nil	20	HH ML SE BO OP
21/05/21	830	1430	6.00	PH	4	1000	NE	3	nil	20	HH ML SE BO OP
30/05/21	1230	1430	2.00	PH	6	1000	ESE	2	nil	20	HH ML SE BO OP
26/06/21	900	1500	6.00	PH	8	1000	E	2	nil	20	HH ML SE BO OP
27/06/21	1300	1500	2.00	PH	6	1000	SE	3	nil	20	HH ML SE BO OP
17/07/21	1130	1430	3.00	PH	4	1000	WSW	3	nil	20	HH ML SE BO OP
01/08/21	800	1200	4.00	PH	4	1000	WSW	3	nil	20	HH ML SE OP
01/08/21	1230	1530	3.00	PH	4	1000	WSW	3	nil	20	BO

*Precipitation codes: Continuous/Intermittent + Light/Hheavy + Rain/Snow/Hail/Fog

Breeding Birds of Open Ground Survey

- 1.30. Surveys were completed using a four-visit adapted Brown & Shepherd (1993) method for upland waders. These visits were completed between April and early July 2018 and April and July 2021 in open ground within a 500 m survey boundary of the proposed turbines. The area of suitable habitat that was covered in 2021 included a slightly larger area than that covered in 2018 (**Figure 9.1.3: Additional survey locations 2021**). Selected bird species were surveyed, namely those included on Annex 1 of the Birds Directive, Schedule 1 of the WCA, Red-listed BoCC and those listed on the UK and local BAPs together with selected other species (see **Annex 9.1.7** for a full list).
- 1.31. Surveys were completed four times between April and July to allow for differences in detection rate between early and late breeding species. Fieldwork was not undertaken in conditions considered likely to affect bird detection, for example, strong winds (greater than Beaufort Force 4), persistent precipitation, poor visibility (less than 300 m) or in unusually hot or cold temperatures. Surveys were undertaken for a total of 27 hours (**Table 9.1.5**).
- 1.32. The survey aimed to cover the ground systematically with a constant search effort. All points within the survey areas were approached closely typically to within 100 m. Patches of scrub, isolated trees, rocky outcrops and streams were investigated closely, and surveyors paused at regular intervals to scan and listen for calling and singing birds. Careful attention was given to recording behaviour indicative of breeding with care taken to avoid counting the same individual more than once.
- 1.33. In some areas access permission was not gained for surveys on foot. In these areas, where possible, watches for activity were conducted from a suitable location overlooking these areas.
- 1.34. The location and activity of birds were mapped onto enlarged 1:25,000 scale OS maps using standard BTO codes (Marchant, 1983). The position of each bird was mapped at the point of first detection and flight lines recorded. At the end of each visit, a summary map was compiled showing the locations of each identified territory or breeding pair. The following evidence was considered diagnostic of breeding: song, courtship or territorial display; territorial dispute; nest building and hole excavation; agitated behaviour by adult bird(s) indicative of the presence of a nearby nest or young (e.g., repetitive alarm calling, distraction display); adult(s) carrying food; presence of newly fledged young; adult(s) removing faecal sac.
- 1.35. Where a number of breeding individuals were present and it was not possible to determine the exact number of breeding pairs, a method was devised to allow the number of discrete territories to be estimated. Registrations of individual birds were deemed to represent discrete breeding territories / pairs if the distance

between them was more than 250 m (500 m for curlew, 200 m for small passerines). Whilst it is recognised that these distances are arbitrary and the territory size varies both inter- and intra- specifically, this approach produces a standardised index of abundance based on the distance that members of a breeding pair are likely to move during the survey period. In cases where two individuals were considered to constitute a pair of birds, the location of the pair was placed centrally by convention.

- 1.36. Population estimates were derived by comparing the summary maps for the four survey visits. Again, a method was devised whereby discrete territories could be estimated. Territories plotted during each visit were considered to be separate from one another if they were located more than 1000 m apart (500 m for snipe, common sandpiper and skylark, 300 m for other small passerines). These distances were chosen to reflect the distances birds could plausibly move between survey dates. The locations of territories mapped in more than one survey period were plotted centrally.

Table 9.1.5. Details of surveys of Breeding Birds of Open Ground conducted in 2018 and 2021.

Date	Start	Finish	Dur. (hrs)	Obs.	Cloud Cover (10 th)	Cloud base (m)	Wind Dir.	Wind Force	Precip*	Vis. (km)	Visit
25/04/18	0935	1235	3.00	PS	5	1000	W	3	ILR	10	1
25/05/18	1350	1650	3.00	JD	3	500	NW	2	nil	15	2
28/06/18	1400	1700	3.00	JD	0	1000	NE	2	nil	15	3
20/07/18	1400	1700	3.00	JD	10	1000	NW	1	nil	15	4
24/04/21	0830	1230	4.00	PH	4	1000	SE	2	nil	20	1
30/05/21	0830	1230	4.00	PH	5	1000	SE	3	nil	20	2
27/06/21	0830	1230	4.00	PH	6	1000	SE	3	nil	20	3
17/07/21	0830	1130	3.00	PH	4	1000	WSW	3	nil	20	4

*Precipitation Codes: Continuous / Intermittent + Light / Heavy + Rain / Snow / Hail / Fog

- 1.37. In addition to the surveys completed in 2018, walkover surveys with watches were carried out during 2017 within the open ground areas as part of an initial inspection of the proposed Development. These covered as much ground within the 2 km survey buffer with access consented or possible due to ground conditions at the time. Thus, they included watches over the Philips Mains Mire SSSI and of the open ground to the west and south of the site. In total an additional 22.75 hours were completed (**Table 9.1.6**).

Table 9.1.6. Details of walkovers in open ground conducted during 2017.

Date	Start	Finish	Duration (hrs)	Obs.	Cloud Cover (10 ^{ths})	Cloud base (m)	Wind Dir.	Wind Force	Precip*	Vis. (km)
14/06/17	0900	1525	6.42	FL	5	2000	S	4	nil	20
15/06/17	0750	1500	7.17	FL	7	1000	SE	3	ILR	5
04/07/17	1200	1700	5.00	FL	5	1000	SE	1	nil	20
05/07/17	0950	1400	4.17	FL	1	2000	S	3	nil	20

*Precipitation codes: Continuous/Intermittent + Light/Heavy + Rain/Snow/Hail/Fog

Winter Walkover Surveys

- 1.38. Walkover surveys were undertaken between October 2018 to March 2019 and October 2019 to March 2020. (Table 9.1.7). Surveys were designed to record any important assemblages of migrant and wintering birds on the site and within a 500 m study area.
- 1.39. Survey routes meandered to encompass as much ground as practical. Where practicable surveyors used a different route to maximise the eventual spatial coverage of the site and paused to scan for birds. Walkover surveys totalling 28 hours were undertaken and a range of weather conditions sampled, although wind speeds of over Beaufort Force 5 were avoided to improve aural detection of species (Table 9.1.7).
- 1.40. In some areas access permission was not gained for surveys on foot. In these areas, where possible, watches for activity were conducted from a suitable location overlooking these areas.
- 1.41. For *Target A* species the time each individual was first detected was recorded along with details of age, sex and behaviour (if possible). These details were cross-referenced to a map where the location and flight route (if applicable) were plotted. For all other species the number of individuals was recorded and locations where they were first detected plotted on the map.

Table 9.1.7. Survey details for Winter Walkovers 2018/2019 and 2019/2020.

Date	Start	Finish	Duration (hrs)	Obs.	Cloud Cover (10 ^{ths})	Cloud Base (m)	Wind Dir.	Wind Force	Precip*	Visibility (km)
03/10/2018	0900	1200	3.00	PS	10	1000	SE	3	nil	10
01/11/2018	1130	1430	3.00	PS	0	-	nil	0	nil	10
14/01/2019	0850	0920	0.50	PS	5	1000	S	1	nil	10
14/01/2019	1120	1150	0.50	PS	10	1000	SSE	2	nil	10
28/01/2019	1030	1100	0.50	PS	10	1000	nil	0	ILR	10
28/01/2019	1300	1330	0.50	PS	10	1000	W	3	ILR	5
06/02/2019	1340	1440	1.00	PS	2	1000	S	2	nil	10
13/02/2019	1300	1400	1.00	PS	6	1000	S	3	nil	10
18/03/2019	1250	1320	0.50	PS	1	1000	W	2	nil	10
21/03/2019	1430	1500	0.50	PS	9	1000	NE	1	nil	5
27/03/2019	1215	1315	1.00	PS	10	1000	W	3	nil	5
14/10/2019	1030	1130	1.00	PS	9	1000	E	1	nil	3
14/10/2019	1430	1630	2.00	PS	10	1000	E	1	nil	3
26/11/2019	0930	1230	3.00	PS	10	1000	E	3	nil	3
19/12/2019	1105	1145	0.67	AA	7	1000	SE	5	nil	20
19/12/2019	1355	1425	0.50	AA	7	1000	SE	5	nil	20
20/12/2019	1050	1120	0.50	AA	3	1000	SE	4	nil	20
29/01/2020	0830	1015	1.75	RAS	6	600	W	4	nil	5
29/01/2020	1215	1245	0.50	RAS	10	600	SW	3	nil	5

Table 9.1.7. Survey details for Winter Walkovers 2018/2019 and 2019/2020.

Date	Start	Finish	Duration (hrs)	Obs.	Cloud Cover (10 ^{ths})	Cloud Base (m)	Wind Dir.	Wind Force	Precip*	Visibility (km)
30/01/2020	0930	1000	0.50	RAS	10	600	SSW	4	CLR	5
30/01/2020	1200	1330	1.50	RAS	8	700	SSW	5	nil	5
23/02/2020	1230	1330	1.00	PS	10	1000	SW	4	nil	3
25/02/2020	1145	1245	1.00	PS	6	1000	nil	0	nil	3
12/03/2020	1100	1300	2.00	PS	7	1000	E	1	nil	3
03/10/2018	0900	1200	3.00	PS	10	1000	SE	3	nil	10

*Precipitation codes: Continuous/Intermittent + Light/Heavy + Rain/Snow/Hail/Eog

Goose and Swan Feeding Distribution Surveys

- 1.42. Surveys were carried out by car and on foot to locate feeding birds in suitable areas around the Site to a distance of 500 m with a number of other suitable areas further afield, in general around the lochs which are components of the Caithness Lochs SPA also checked. The time, species and number of any birds observed was recorded and the location marked on a 1: 25,000 scale OS map. Surveys took place between October 2017 to April 2018, October 2018 to April 2019 and October 2019 to March 2020. Surveys were carried out for a total of 113 hours (Table 9.1.8).

Table 9.1.8. Surveys details for Goose and Swan Distribution surveys.

Date	Start	Finish	Duration (hrs)	Obs.	Cloud Cover (10 ^{ths})	Cloud Base (m)	Wind Dir.	Wind Force	Precip*	Visibility (km)
06/10/2017	0900	1400	5.00	DJC	3	1000	WSW	3	nil	6
25/11/2017	0855	1305	4.17	DJC	10	600	NW	6	IHR	3
11/01/2018	0847	1630	7.72	DJC	0	-	W	1	nil	6
15/02/2018	0900	1445	5.75	NR	5	800	SW	4	nil	10
20/03/2018	0930	1615	6.75	NR	6	1000	NW	3	nil	20
13/04/2018	0730	1400	6.50	NR	10	500	E	4	IHR	10
18/10/2018	0915	1500	5.75	NR	10	1000	W	3	nil	20
19/11/2018	0900	1500	6.00	PS	10	1000	SE	2	nil	10
14/12/2018	0900	1500	6.00	PS	6	1000	SE	4	nil	10
15/01/2019	0900	1500	6.00	PS	10	1000	W	2	ILR	10
03/03/2019	0930	1530	6.00	PS	7	1000	SW	3	nil	10
15/03/2019	1115	1715	6.00	NR	8	700	W	5	IHR	10
05/04/2019	0900	1500	6.00	PS	2	1000	ESE	2	nil	10
15/10/2019	1000	1600	6.00	PS	3	1000	SE	2	nil	3
27/11/2019	0900	1500	6.00	PS	10	1000	NE	3	ILR	3
11/12/2019	0900	1500	6.00	PS	2	1000	SE	4	nil	3
15/01/2020	0900	1500	6.00	PS	8	1000	SW	3	nil	3
08/02/2020	0900	1500	6.00	PS	3	1000	SE	3	nil	3
08/03/2020	0900	1500	6.00	PS	8	1000	W	3	nil	3

*Precipitation codes: Continuous/Intermittent + Light/Heavy + Rain/Snow/Hail/Eog

Hen Harrier Winter Roost Watches

1.43. Dusk watches for signs of winter roosting by hen harriers were carried out over suitable habitats where possible within the 2 km survey buffer during the months of October to March in the winters of 2018/2019 and 2019/2020 (**Table 9.1.9**).

Table 9.1.9. Survey details of checks for Hen Harrier Winter Roosts 2018/19 and 2019/20.											
Date	Start	Finish	Duration (hrs)	Obs.	Cloud Cover (10 ^{ths})	Cloud Base (m)	Wind Dir.	Wind Force	Precip*	Vis. (km)	Results
11/01/18	1430	1630	2.0	DJC	0	-	WSW	1	nil	6	Male, female
15/02/18	1445	1700	2.25	NR	7	800	SW	4	nil	10	Nil result
17/10/18	1555	1825	2.5	PS	3	1000	SW	3	nil	10	Male
23/10/18	1600	1815	2.25	PR	10	200	SW	4	ILR	10	Nil result
01/11/18	1500	1700	2.0	PS	0	-	nil	0	nil	10	Nil result
23/11/18	1410	1640	2.5	PS	8	1000	nil	0	nil	10	2 ringtails
04/12/18	1400	1600	2.0	PS	1	1000	nil	0	nil	10	Ringtail
12/12/18	1345	1615	2.5	JD	8	1000	NE	4	nil	30	Nil result
23/01/19	1430	1700	2.5	PS	5	1000	NW	1	nil	10	Nil result
30/01/19	1430	1700	2.5	PS	10	1000	NW	3	nil	10	Nil result
06/02/19	1515	1715	2.0	PS	6	1000	SE	1	nil	10	Male
15/02/19	1540	1740	2.0	PS	7	1000	SSW	3	nil	10	Male
18/03/19	1700	1900	2.0	PS	0	-	W	1	nil	10	Nil result
25/03/19	1715	1915	2.0	PS	10	1000	N	3	nil	5	Nil result
18/10/19	1540	1840	3.0	PS	10	1000	SE	2	nil	3	Nil result
28/11/19	1320	1620	3.0	PS	4	1000	NE	3	ILR	3	Male, ringtail
09/12/19	1315	1615	3.0	PS	6	1000	NE	2	nil	3	Ringtail
27/01/20	1400	1700	3.0	PS	5	1000	SW	3	nil	3	Nil result
05/02/20	1420	1720	3.0	PS	10	1000	SW	2	nil	3	Nil result
06/03/20	1530	1830	3.0	PS	7	1000	SE	1	nil	3	Nil result

Field Survey Results

Wildfowl

Occurrence and Status

1.44. **Greylag goose, pink-footed goose, Greenland white-fronted goose and whooper swan** were recorded. Greenland white-fronted goose and whooper swan are found on Annex 1 of the Birds Directive and are qualifying species for the Caithness Lochs SPA. Greylag goose is a qualifying species for the Caithness Lochs SPA. Pink-footed goose are a regular winter migratory species and as such are afforded protection under the Birds Directive.

1.45. Duck species including goldeneye, wigeon, goosander, red-breasted merganser, tufted duck, teal, pintail and mallard were recorded incidentally on the

neighbouring lochs during winter surveys for foraging and roosting goose and swan species. None of these species occurred in the study area or during the breeding season.

Abundance and Distribution

- 1.46. Flocks of between one individual and 130 **whooper swans** were recorded during the non-breeding season in January, February, March, April, October, November and December. Birds were seen on Loch of Mey, Loch Heilan, St John’s Loch and the Burn of Ham and feeding in fields around the wider area (**Figures 9.1.6, 9.1.7 & 9.1.10; Table 9.1.10**).
- 1.47. A few flocks of **Greenland white-fronted goose** were recorded during the months of January, February, March and November. Flocks of between two and 160 were recorded feeding in the wider area, but no flights passed over the FA (**Figures 9.1.6, 9.1.8, 9.1.9 & 9.1.10; Table 9.1.10**).
- 1.48. Many sightings of **greylag geese** were recorded. Flocks occurred feeding in the wider area and also made use of fields within the study area. They were seen on Loch of Mey during the non-breeding season. They also occurred in the breeding season, and they were noted as using Phillips Mains mire as an occasional roost in August. Their presence was recorded during surveys in every month of the year (**Figures 9.1.6, 9.1.8, 9.1.9 & 9.1.10; Table 9.1.10**).
- 1.49. Numerous flocks of **pink-footed goose** were recorded foraging in the wider area and in fields within the study area. Flock sizes ranged from one to 1300 birds, during January, February, March, April, September, October, November and December (**Figures 9.1.6, 9.1.8, 9.1.9 & 9.1.10; Table 9.1.10**).

Flight Activity recorded during GVPs

- 1.50. Eight flights of **whooper swan** were recorded during GVP surveys. Of these, four flights by were recorded, involving 21 birds, for a total duration of 3,463 seconds of flight (when each flight duration is multiplied by the flock size involved) within 500 m of the proposed turbine locations (**Figure 9.1.7; Table 9.1.11**).
- 1.51. Seventy-two flights by **greylag goose** were recorded during GVP surveys involving 2,789 birds. Of these, 56 flights (1,770 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.8; Table 9.1.11**).
- 1.52. Seven flights by **pink-footed goose** were recorded involving 173 birds. Of these, 6 flights (151 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.8; Table 9.1.11**).

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.

Date	Time	Species	No. birds	Location	Behaviour
06/10/2017	0930	Whooper swan	23	Loch Heilan	Feeding
	0935	Greylag goose	54	Loch Heilan	Birds remaining after 0931
	0935	Pink-footed goose	62	Loch Heilan	Birds remaining after 0931
	1130	Greylag goose	60	Rattar	Resting/feeding
	1130	Pink-footed goose	20	Rattar	Resting/feeding
	1130	Greylag goose	29	Rattar	Feeding
	1228	Whooper swan	41	St Johns Loch	Feeding
	1315	Pink-footed goose	245	Loch Heilan	2nd visit; Feeding
	1315	Greylag goose	27	Loch Heilan	2nd visit; Feeding
	1350	Greylag goose	210	Hollandmey Moss	2nd visit & count of geese; Feeding
	1350	Pink-footed goose	30	Hollandmey Moss	2nd visit & count of geese; Feeding
25/11/2017	0905	Greylag goose	580	ND 294 728	Feeding / Loafing, in stubble
	0927	Pink-footed goose	30	ND 290 733	Landed in stubble field
	0927	Whooper swan	30	ND 287 734	Feeding / Loafing, in stubble
	0927	Greylag goose	28	ND 287 734	Feeding / Loafing, in stubble
	0950	Pink-footed goose	350	ND 262 734	Feeding / Loafing, in stubble
	0950	Greylag goose	98	ND 262 734	Feeding / Loafing, in stubble
	1011	Whooper swan	50	ND 266 725	Feeding / Loafing, in stubble
	1011	Pink-footed goose	40	ND 266 725	Feeding / Loafing, in stubble
	1037	Greenland white-fronted goose	8	ND 280 727	Feeding in stubble
	1037	Pink-footed goose	6	ND 280 727	Feeding in stubble
	1053	Whooper swan	11	ND 246 713	Feeding / Loafing, in stubble
	1053	Pink-footed goose	400	ND 246 713	Feeding / Loafing, in stubble
	1115	Whooper swan	21	Loch Heilan	Feeding, Distant view, some may be mute swans
	1120	Greylag goose	100	ND 246 686	Feeding on grass
	1130	Whooper swan	9	ND 240 675	Feeding / Loafing, in stubble
	0909	Whooper swan	4	St Johns Loch	Feeding on loch prior to taking flight
	0916	Greylag goose	32	Killi Cairn	Feeding on grass
	0916	Greylag goose	50	Little Wester	Feeding on grass
	0935	Whooper swan	6	St Johns Loch	Feeding
	1025	Pink-footed goose	450	Rosegill	Feeding / Loafing
	1038	Greylag goose	9	Rosegill	Feeding on grass
	1046	Greylag goose	65	Rattar house	
	1115	Whooper swan	43	Charleston	

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.

Date	Time	Species	No. birds	Location	Behaviour	
	1122	Greylag goose	2	Loch Mey	Feeding on loch	
	1122	Pink-footed goose	2	Loch Mey	Feeding on loch	
	1145	Mixed flock geese	400	Philips Mains	PG 60% GJ 40% feeding / loafing on grass field	
	1145	Greylag goose	6	Philips Mains	Feeding on grass field	
	1145	Pink-footed goose	12	Philips Mains	Feeding on grass field	
	1145	Greylag goose	60	Philips Mains	Feeding / loafing on grass field	
	1145	Pink-footed goose	8	ND 302 722	Feeding on grass field	
	1226	Greenland white-fronted goose	53	West Lodge	Feeding / loafing on grass field	
	1300	Whooper swan	42	Loch Hielan	Feeding	
	1300	Pink-footed goose	11	Loch Hielan	Feeding	
	1300	Greylag goose	1	Loch Hielan	Feeding	
	15/2/2018	0920	Pink-footed goose	500	Mey	Feeding
		0920	Greenland white-fronted goose	11	Mey	Feeding
		0935	Greylag goose	80	Mey	Feeding
0945		Whooper swan	1	Loch of Mey		
1110		Greylag goose	150	ND 245 725	Feeding	
1115		Greylag goose	40	ND 247 719	Feeding	
1120		Greylag goose	220	ND 231 717	Feeding	
1130		Greylag goose	25	St Johns Loch		
1210		Greenland white-fronted goose	160	ND 289 722	Feeding	
1210		Pink-footed goose	60	ND 288 723	Feeding	
1220		Greylag goose	15	Philips Mains	Feeding	
1220		Pink-footed goose	250	ND 295 728	Feeding	
1230		Greylag goose	120	Warse	Feeding	
1240		Greylag goose	80	ND 328 708	Feeding	
1410		Greylag goose	30	Loch Heilan		
0955		Greylag goose	50	ND 246 688	Feeding	
1005		Whooper swan	50	ND 247 707	Feeding	
1045		Greylag goose	30	ND 247 707	Feeding	
1025		Greylag goose	15	St Johns Loch		
1025		Whooper swan	12	St Johns Loch		
1040		Greylag goose	200	ND 233 725	Feeding	
1105		Greylag goose	120	ND 263 726	Loafing in ploughed field	
1115		Greylag goose	130	ND 288 733	Feeding	
1200		Greenland white-fronted goose	9	Loch of Mey		
1200		Greylag goose	200	Loch of Mey		
1200		Whooper swan	1	Loch of Mey		
1210		Greenland white-fronted goose	45	Loch of Mey	Feeding	
1315	Pink-footed goose	1300	ND 298 724	Feeding		

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.

Date	Time	Species	No. birds	Location	Behaviour
	1315	Greylag goose	50	ND 298 724	Feeding
	1430	Greylag goose	34	ND 323 692	Feeding
	1450	Greylag goose	300	ND 276 659	Feeding
13/04/2018	0815	Pink-footed goose	70	ND 319 695	
	0855	Pink-footed goose	160	ND 304 728	
	0910	Pink-footed goose	60	ND 297 724	
	0920	Pink-footed goose	50	ND 289 708	
	0940	Whooper swan	11	ND 265 723	
	0940	Greylag goose	60	ND 270 724	
	1210	Pink-footed goose	120	ND 244 719	
	1210	Greylag goose	30	ND 244 719	
	1220	Pink-footed goose	80	ND 253 696	
	1320	Greylag goose	9	ND 264 678	
	1330	Whooper swan	9	ND 253 702	
18/10/2018	0915	Whooper swan	410	ND 284 640	
	0915	Greylag goose	100	ND 284 640	
	0936	Pink-footed goose	150	ND 328 702	
	1020	Whooper swan	45	ND 285 732	
	1020	Greylag goose	50	ND 285 732	
	1130	Greylag goose	30	ND 298 724	
	1130	Pink-footed goose	80	ND 298 724	
19/11/2018	1215	Whooper swan	15	St Johns Loch	
	0910	Greylag goose	200	ND 227 717	
	1005	Whooper swan	1	ND 238 734	
	1045	Greylag goose	190	ND 281 728	
	1112	Greylag goose	8	ND 336 725	
	1215	Whooper swan	50	ND 294 336	
	1215	Greylag goose	140	ND 295 664	
	1253	Greylag goose	50	ND 242 682	
	1326	Greylag goose	100	ND 276 719	
	1400	Whooper swan	16	Loch of Mey	
14/12/2018	1400	Greylag goose	11	Loch of Mey	
	0915	Greylag goose	90	ND 229 718	
	0937	Whooper swan	3	ND 238 734	Feeding
	1100	Whooper swan	2	ND 258 680	Feeding
	1145	Greylag goose	60	ND 251 690	Feeding
	1250	Whooper swan	15	ND 271 735	Feeding
15/01/2019	1250	Greylag goose	2	ND 271 734	Feeding
	1019	Whooper swan	4	ND 291 707	
	1039	Greylag goose	25	ND 238 734	
	1200	Whooper swan	11	ND 281 728	

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.

Date	Time	Species	No. birds	Location	Behaviour	
	1225	Greylag goose	70	ND 251 685		
	1225	Pink-footed goose	1	ND 249 690		
	1330	Whooper swan	27	ND 250 690		
	1330	Greylag goose	1	ND 270 737		
03/03/2019	0935	Greylag goose	270	ND 270 736		
	0935	Pink-footed goose	1	ND 227 718		
	1005	Whooper swan	3	ND 238 732		
	1135	Pink-footed goose	180	ND 295 664		
	1225	Whooper swan	2	ND 258 680		
	1317	Greylag goose	250	ND 285 734		
	1409	Greylag goose	130	ND 271 736		
	1409	Whooper swan	3	ND 271 737		
	15/03/2019	1115	Pink-footed goose	180	ND 291 649	
		1125	Pink-footed goose	15	Brabstermire	
1140		Pink-footed goose	580	ND 350 718		
1150		Greylag goose	230	ND 331 722		
1220		Greenland white-fronted goose	135	ND 265 720		
1220		Greylag goose	25	ND 265 721		
1220		Whooper swan	1	ND 266 720		
1230		Greylag goose	80	ND 244 723		
1245		Pink-footed goose	40	ND 267 717		
1315		Pink-footed goose	80	ND 285 733	Mixed flock	
1315		Greylag goose	360	ND 287 733	Mixed flock	
1320		Greylag goose	35	ND 283 736		
1440		Greylag goose	10	ND 228 725		
1525		Whooper swan	17	ND 254 704		
1530		Pink-footed goose	120	ND 252 704		
1540		Pink-footed goose	240	ND 258 688		
0908		Whooper swan	4	ND 226 720	Feeding	
0912		Greylag goose	12	ND 232 717	Feeding	
1016		Greylag goose	150	ND 319 733	Feeding	
1100		Greylag goose	2	ND 311 684	Feeding	
1109	Pink-footed goose	6	ND 298 663	Feeding		
1202	Greylag goose	10	ND 257 686	Feeding		
1205	Greylag goose	40	ND 248 679	Feeding		
1205	Whooper swan	1	ND239 684	Feeding		
1240	Greylag goose	2	ND 250 699	Feeding		
1330	Greylag goose	180	ND 271 731	Feeding		
1330	Greylag goose	100	ND 271 735	Feeding		
1330	Whooper swan	9	ND 270 736	Feeding		
1440	Greylag goose	240	ND 293 707	Feeding		

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.					
Date	Time	Species	No. birds	Location	Behaviour
15/10/2019	1015	Whooper swan	50	ND 225 723	
	1015	Greylag goose	10	ND 224 722	
	1120	Greylag goose	200	ND 259 730	
	1200	Whooper swan	12	ND 271 736	
	1240	Greylag goose	110	ND 253 736	
	1430	Whooper swan	9	ND 254 684	
	1520	Greylag goose	170	ND 248 689	
27/11/2019	0950	Greylag goose	200	ND 250 724	
	0950	Whooper swan	30	ND 251 725	
	1058	Greylag goose	60	ND 250 734	
	1058	Whooper swan	30	ND 251 735	
	1310	Whooper swan	9	ND 252 685	
	1005	Greylag goose	210	ND 251 735	
	1130	Greylag goose	20	ND 271 736	
1130	Whooper swan	2	ND 270 735		
15/01/2020	0915	Whooper swan	5	ND 229 720	
	1025	Greylag goose	460	ND 281 736	
	1025	Greenland white-fronted goose	2	ND 280 736	
	1030	Greylag goose	40	ND 282 729	
	1040	Greenland white-fronted goose	6	ND 281 728	
	1040	Pink-footed goose	3	ND 282 728	
	1145	Greylag goose	8	ND 271 736	
	1325	Whooper swan	1	ND 256 681	
	1420	Greylag goose	110	ND 249 687	
	1105	Greylag goose	250	ND 276 735	
	1130	Whooper swan	3	ND 272 736	
	1246	Whooper swan	14	ND 259 680	
	1246	Greylag goose	400	ND 263 680	
	1315	Greylag goose	450	ND 238 683	
	1335	Greylag goose	10	ND 249 687	
1350	Whooper swan	26	ND 270 712		
1350	Greylag goose	180	ND 269 711		
08/03/2020	0910	Greylag goose	70	ND217683	
	1005	Greylag goose	30	ND275746	
	1010	Greylag goose	5	Scorrie Moss	
	1030	Greylag goose	5	ND271736	
	1030	Whooper swan	6	ND271735	
	1225	Pink-footed goose	360	ND306682	
	1240	Whooper swan	3	Slickly	
	1330	Whooper swan	70	ND 251 685	
1345	Greylag goose	25	ND 267 692		

Table 9.1.10. Records of wildfowl recorded during Goose and Swan Distribution surveys.					
Date	Time	Species	No. birds	Location	Behaviour
	1350	Greylag goose	60	ND 261 685	
	1355	Greylag goose	15	ND 264 676	
	1410	Greylag goose	50	ND 248 689	
	1415	Whooper swan	130	ND 250 701	
	1415	Whooper swan	16	ND 261 693	

Table 9.1.11. Flight activity and elevation by swan and goose species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches (September 2018 to March 2020).

Species	Period	VP No.	Flight Id	No. birds	Total flying time (s)	Flight height category						
						<10m	10-30m	30-50m	50-100m	100-150m	>150m	
Greylag goose	Sep-Mar	1	HOL_181010_001_B003	2						✓		
			HOL_181118_001_B001	11						✓		
			HOL_181118_001_B002	13						✓		
			HOL_181118_001_B003	25						✓		
			HOL_181204_001_B001	15						✓		
			HOL_181204_001_B002	15						✓		
			HOL_181216_001_B002	20						✓		
			HOL_190206_001_B001	80						✓		
			HOL_190314_001_B002	5		✓	✓					
			HOL_191009_001_B005	220						✓		
			HOL_191101_001_B001	30						✓		
			HOL_191101_001_B002	11						✓		
			HOL_191101_001_B007	4						✓		
			HOL_191101_001_B008	30						✓		
			HOL_191101_001_B009	50						✓		
			HOL_191101_001_B012	30							✓	
			HOL_191219_002_B002	6								✓
			HOL_191220_001_B001	31							✓	
		HOL_200129_001_B002	55					✓	✓			
		HOL_200223_001_B001	12						✓			
		HOL_200223_001_B002	4					✓				
		HOL_200225_001_B002	8						✓			
		HOL_200225_001_B003	6						✓			
		HOL_200225_001_B004	30						✓			
		HOL_200225_001_B006	3						✓			
		HOL_180926_001_B001	15							✓		
		HOL_181001_001_B001	50							✓		
		HOL_181017_001_B001	1						✓			
HOL_181017_001_B003	80							✓				
HOL_181122_001_B001	5					✓	✓					
HOL_181122_001_B002	40						✓					
HOL_181122_001_B003	6					✓						
HOL_181204_002_B001	8						✓					
HOL_190314_002_B002	5					✓						

Table 9.1.11. Flight activity and elevation by swan and goose species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches (September 2018 to March 2020).

Species	Period	VP No.	Flight Id	No. birds	Total flying time (s)	Flight height category						
						<10m	10-30m	30-50m	50-100m	100-150m	>150m	
Greylag goose	Sep-Mar	2	HOL_190327_001_B003	10				✓				
			HOL_190327_001_B004	1				✓				
			HOL_190906_002_B001	5							✓	
			HOL_190906_002_B003	5							✓	
			HOL_191003_001_B002	25						✓		
			HOL_191011_001_B001	9						✓		
			HOL_191011_001_B003	30						✓		
			HOL_191118_001_B001	8						✓		
			HOL_191118_001_B002	400							✓	
			HOL_191118_001_B003	9					✓			
			HOL_191126_001_B001	8						✓		
			HOL_191220_003_B001	13								✓
			HOL_200223_002_B001	40				✓	✓	✓		
			HOL_200223_002_B002	30					✓			
	HOL_200225_002_B001	30						✓				
	HOL_200225_002_B003	30							✓			
Apr-Aug	1	HOL_180413_001_B002	70					✓				
		HOL_180413_001_B005	60					✓				
		HOL_180824_001_B002	13					✓				
	2	HOL_190820_001_B001	27				✓	✓				
		HOL_180411_001_B001	14				✓					
Pink-footed Goose	Sep-Mar	1	HOL_181010_001_B001	21		✓	✓					
			HOL_181216_001_B003	9				✓				
			HOL_181024_001_B003	13			✓	✓				
	Apr-Aug	1	HOL_180424_001_B003	50				✓	✓			
			HOL_180424_001_B004	90			✓	✓	✓			
HOL_190409_001_B002	1					✓	✓	✓				
Whooper swan	Sep-Mar	1	HOL_191101_001_B006	5	253 (1265*)	80*		235*	950*			
			HOL_191101_001_B011	6	188 (1128*)		186*	942*				
	Apr-Aug	2	HOL_191011_001_B002	5	84 (420*)				420*			
			HOL_190404_001_B003		130 (650*)			650*				

*Duration multiplied by flock size

Flight Activity recorded during MWP

- 1.53. Ten flights by **whooper swan** were recorded during MWP surveys. Of these, two flights involving 8 birds for a total of 390 seconds of flights passed within 500 m of the proposed turbines (**Figure 9.1.7; Table 9.1.12**).
- 1.54. Sixty flights by **greylag goose** were recorded involving 2,449 birds. Of these, 13 flights (533 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.9; Table 9.1.12**).
- 1.55. Forty-one flights by **pink-footed goose** were recorded involving 3,010 birds. Of these, 15 flights (1051 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.9; Table 9.1.12**).

Scarce breeding raptors and owlsOccurrence and Status

- 1.56. Sightings of **hen harrier, red kite, merlin, peregrine, barn owl** and **short-eared owl** were recorded. All these are listed on Annex 1 of the Birds Directive, and all are listed on Schedule 1 of the WCA except short-eared owl. Hen harrier and merlin are Red-listed Birds of Conservation Concern. Other raptors of lesser conservation concern were also recorded including common buzzard (*Buteo buteo*), common kestrel (*Falco tinnunculus*) and sparrowhawk (*Accipiter nisus*).

Abundance and distribution

- 1.57. **Hen harrier** was recorded regularly during both non-breeding seasons, some flight activity was noted during the breeding season of 2018, but no breeding behaviour was observed within the study area. Roosting birds (or birds exhibiting pre-roosting behaviour) were observed within the study area on eight days during the non-breeding period (**Confidential Figure 9.3.1; Figures 9.1.11 & 9.1.12; Tables 9.1.13 & 9.1.15**).
- 1.58. A single **red kite** was observed from a GVP in June 2019 (**Figure 9.1.11**).
- 1.59. **Peregrine** was recorded on one occasion outside the study area in the non-breeding period. No evidence of breeding was recorded within the study area (**Figure 9.1.12**).
- 1.60. **Merlin** was recorded infrequently throughout the survey period with no evidence of breeding within the study area (**Figures 9.1.11 & 9.1.12**).

- 1.61. **Short-eared owl** was recorded within the study area on three occasions during the breeding season of 2018. No breeding activity was noted (**Figures 9.1.12**).

- 1.62. A single **barn owl** was recorded roosting in a ruined building within the study area, no breeding activity was recorded (**Confidential Figure 9.3.1**).

Flight Activity recorded during GVPs

- 1.63. Twenty-one flights by **hen harrier** were recorded. Of these 17 flights (17 birds) passed within 500 m of the proposed turbines for a duration of 1,952 seconds. Of this 959 second was below risk height of the proposed turbines⁴ (**Figure 9.1.11; Table 9.1.13**).
- 1.64. A single **red kite** flight was recorded within 500 m of the proposed turbines for a duration of 25 seconds (**Figure 9.1.11; Table 9.1.13**).
- 1.65. A single **merlin** flight was recorded within 500 m of the proposed turbines for a duration of 74 seconds (**Figure 9.1.11; Table 9.1.13**).

⁴ Risk height of the proposed turbines is between 18.5 and 150 m

Table 9.1.12. Flight activity and elevation by swan and goose species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during MWP watches (Autumn 2018 and 2019, Spring 2018 and 2019).

Species	Period	Flight Id	No. birds	Total fly time (s)	Time in height category (s)					
					<10m	10-30m	30-50m	50-100m	100-150m	>150m
Greylag goose	Autumn	HOL_180322_001_B001	34						✓	
		HOL_180322_001_B003	9				✓	✓	✓	✓
		HOL_180322_001_B008	16					✓	✓	
		HOL_180322_001_B009	85					✓		
		HOL_180918_001_B002	2							✓
		HOL_181010_002_B016	35					✓	✓	✓
		HOL_190919_002_B001	25					✓		
		HOL_191009_002_B006	25						✓	
		HOL_191011_002_B001	4					✓		
	Spring	HOL_180402_001_B004	250			✓	✓	✓	✓	✓
		HOL_180406_001_B001	1					✓		
		HOL_190409_002_B001	7						✓	
		HOL_190411_001_B001	40						✓	
Pink-footed Goose	Autumn	HOL_180322_001_B012	120					✓	✓	✓
		HOL_180322_001_B013	140						✓	
		HOL_181009_001_B002	22					✓	✓	
		HOL_181009_001_B003	14					✓		
		HOL_181009_001_B007	36					✓	✓	
		HOL_181009_001_B009	15						✓	
		HOL_181009_001_B010	75					✓		
		HOL_181009_001_B016	26					✓		
		HOL_181009_001_B020	60					✓		
		HOL_181010_002_B005	130					✓		
	HOL_181024_001_B003	13				✓	✓			
	Spring	HOL_180403_001_B008	100						✓	✓
		HOL_180403_001_B009	30						✓	✓
		HOL_180403_001_B011	150					✓	✓	
HOL_180412_001_B005		120			✓	✓	✓	✓	✓	
Whooper swan	Autumn	HOL_181024_001_B002	2	45 (90*)			90*			
		HOL_181024_001_B004	6	50 (300*)				300*		

*Duration multiplied by flock size

Table 9.1.13. Flight activity and elevation by raptor species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches.

Species	Period	GVP No.	Flight Id	No. birds	Total fly time (s)	Time in height category (s)					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Hen harrier	Apr-Aug	2	HOL_180404_002_B001	1	180	150	30	0	0	0	0
	Total				1	180	150	30	0	0	0
	Sept-Mar	1	HOL_191219_001_B001	1	155	155	0	0	0	0	0
			HOL_191219_002_B003	1	47	0	0	0	47	0	0
	Total				2	202	155	0	0	47	0
	Sep-Mar	2	HOL_180905_002_B001	1	130	0	130	0	0	0	0
			HOL_180905_002_B002	1	229	0	229	0	0	0	0
			HOL_181017_001_B002	1	147	0	147	0	0	0	0
			HOL_181216_002_B001	1	41	41	0	0	0	0	0
			HOL_190128_002_B001	1	62	0	62	0	0	0	0
			HOL_190128_003_B001	1	145	0	145	0	0	0	0
			HOL_190206_002_B001	1	44	0	44	0	0	0	0
			HOL_191219_003_B001	1	38	38	0	0	0	0	0
			HOL_191219_003_B002	1	73	73	0	0	0	0	0
			HOL_200129_002_B001	1	101	84	17	0	0	0	0
HOL_200129_002_B002			1	91	91	0	0	0	0	0	
HOL_200129_002_B003			1	303	303	0	0	0	0	0	
HOL_200306_002_B001	1	24	24	0	0	0	0	0			
HOL_200312_002_B001	1	142	142	0	142	0	0	0	0		
Total				14	1570	654	916	0	0	0	
Red Kite	Apr-Aug	2	HOL_190629_001_B006	1	25	0	0	25	0	0	0
	Total				1	25	0	0	25	0	0
Merlin	Apr-Aug	2	HOL_190514_001_B003	1	74	0	56	18	0	0	0
	Total				1	74	18	56	18	0	0

Hen harrier winter roosts

1.66. Eleven sightings of hen harrier were recorded during surveys timed to attempt to observe possible roost behaviour. Male, female and 'ringtail' (unidentified female or juvenile brown) birds were seen, with two individuals minimum present on two dates (**Confidential Figure 9.3.1; Table 9.1.14**).

Table 9.1.14. Observations made during surveys for winter hen harrier roost activity.

Date	Time	No. birds	Sex	Behaviour
11/01/2018	1456	1	Female	Flying
11/01/2018	1559	1	Male	Flying, landed in roost
17/10/2018	1813	1	Male	Flying
23/11/2018	1456	1	Ringtail	Flying
	1536	1	Ringtail	Perch on fence post. Same bird as above?
04/12/2018	1426	1	Ringtail	
06/02/2019	1709	1	Male	Landed in tall vegetation, roost?
15/02/2019	1723	1	Male	Into roost?
28/11/2019	1528	1	Male	
	1528	1	Ringtail	
09/12/2019	1455	1	Ringtail	Flying

Incidental Flight Activity

- 1.67. Twenty-one flights by **hen harrier** were recorded during the course of other surveys during the study period (**Figure 9.1.12**).
- 1.68. Six flights by **merlin** were recorded during the course of other surveys during the study period (**Figure 9.1.12**).

Common crane

Occurrence and Status

1.69. **Common crane** was recorded in flight on two occasions during the survey period once during a GVP and once during an SBB survey. There were also two incidental records of a single bird feeding on one day in November 2018 in the fields near Scoolary (**Figure 9.1.16**). Common Crane is listed on Schedule 1 of the WCA and Annex 1 of the Birds Directive.

Flight Activity recorded during GVPs

1.70. One flight was recorded during a GVP survey within 500 m of the proposed turbines for a duration of 18 seconds (**Figure 9.1.13; Table 9.1.15**).

Table 9.1.15. Flight activity and elevation by common crane which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches.

Species	Period	GVP No.	Flight Id	No. birds	Total fly time (s)	Time in height category					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Common crane	Sep-Mar	2	HOL_181107_001_B001	1	18	18	0	0	0	0	0
		Total		1	18	18	0	0	0	0	0

Waders

Occurrence and Status

1.71. **Golden plover** (*Pluvialis apricaria*), **dunlin** (*Calidris alpina*), **curlew** (*Numenius arquata*), **lapwing** (*Vanellus vanellus*), **ringed plover** (*Charadrius hiaticula*) and **woodcock** (*Scolopax rusticola*) were recorded. **Golden plover** and **dunlin** are listed on Annex 1 of the Birds Directive. **Curlew** is a Red-listed Bird of Conservation Concern and is also listed on IUCN 'Red list - 'Near Threatened' (IUCN, 2019). **Lapwing**, **ringed plover** and **woodcock** are Red-listed Bird of Conservation Concern. Other waders of lesser conservation concern were also recorded including oystercatcher (*Haematopus ostralegus*), snipe (*Gallinago gallinago*) and jack snipe (*Lymnocyptes minimus*).

Abundance and distribution

- 1.72. Small numbers of **curlew** were present in the breeding season (with records in March, April, May, June, July and August) with one territory recorded within 500 m of the proposed turbine locations in 2019 and two in 2021 (**Figure 9.1.13; Table 9.1.19**).
- 1.73. **Golden plover** were present through the year, with records in January, February, March, April, May, July, September, October and November. One territory was recorded within 500 m of the proposed turbine locations in 2019 (**Figure 9.1.13; Table 9.1.19**).
- 1.74. **Dunlin** were seen once in October 2017 and on one day in May 2019. **Lapwing** were seen in the proposed Development in March, April, May, June, July, August, September, October and November whilst oystercatcher was present in April, May, June and July and **ringed plover** in June. A maximum of three **lapwing**, one **ringed plover** and two oystercatcher territories were recorded within 500 m of the proposed turbine locations.

Flight Activity recorded during GVPs

- 1.75. Seventy-six **curlew** flights involving 102 birds were recorded. Of these, 45 flights (56 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.14; Table 9.1.16**).
- 1.76. Fourteen **golden plover** flights involving 336 birds were recorded. Ten of these flights (282 birds) passed within 500 m of the proposed turbine locations (**Figure 9.1.14; Table 9.1.16**).
- 1.77. One **dunlin** flight involving 20 birds was recorded, it did not pass within 500 m of the proposed turbines (**Figure 9.1.14**).

Table 9.1.16. Flight activity and elevation by wader species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches.

Species	Period	GVP	Flight Id	No. birds	Height category (m)					
					<10	10-30	30-50	50-100	100-150	>150
Curlew	Apr-Aug	1	HOL_180604_001_B004	2			✓	✓		
			HOL_180604_001_B005	2	✓	✓	✓	✓	✓	
			HOL_180621_001_B002	2				✓	✓	
		2	HOL_180424_002_B001	1	✓	✓				
			HOL_180501_002_B001	1		✓				
			HOL_180501_002_B002	1		✓				
			HOL_180501_002_B003	1		✓				
			HOL_180501_002_B004	2		✓				
			HOL_180501_002_B005	2			✓			
			HOL_180501_002_B006	1			✓			
			HOL_180501_002_B007	2		✓	✓	✓		
			HOL_180501_002_B008	1		✓				
			HOL_180511_001_B001	2		✓				
			HOL_180511_001_B002	1		✓				
			HOL_180511_001_B003	2		✓				
	HOL_180607_001_B001	1		✓	✓	✓	✓			
	HOL_180621_002_B001	2			✓					
	HOL_180625_001_B001	1			✓					
	HOL_180711_001_B001	1	✓							
	HOL_180711_001_B002	1		✓	✓	✓				
	HOL_180711_001_B003	1		✓	✓					
	HOL_190401_002_B001	1	✓							
	HOL_190401_002_B002	1			✓					
	HOL_190401_002_B003	1	✓							

Table 9.1.16. Flight activity and elevation by wader species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches.

Species	Period	GVP	Flight Id	No. birds	Height category (m)					
					<10	10-30	30-50	50-100	100-150	>150
Curlew	Apr-Aug	2	HOL_190401_002_B004	2		✓				
			HOL_190404_001_B001	1		✓				
			HOL_190404_001_B002	1	✓	✓	✓			
			HOL_190408_001_B001	1		✓				
			HOL_190408_001_B002	1	✓					
			HOL_190408_001_B004	2		✓				
			HOL_190506_002_B001	1		✓				
			HOL_190506_002_B002	1		✓				
			HOL_190508_002_B001	1		✓	✓			
			HOL_190508_002_B002	1		✓	✓			
			HOL_190514_001_B001	1		✓				
			HOL_190514_001_B002	1	✓	✓				
			HOL_190604_002_B001	1		✓				
			HOL_190618_002_B001	1	✓	✓				
			HOL_190629_001_B001	1	✓					
	HOL_190629_001_B002	1	✓							
	HOL_190629_001_B003	1	✓							
	HOL_190629_001_B005	1	✓							
	HOL_190715_002_B001	1		✓						
	Sept-March	2	HOL_190327_001_B001	1		✓				
HOL_190327_001_B002			1		✓					
Apr-Aug	2	HOL_180511_001_B004	2	✓						
		HOL_190408_001_B003	170			✓				
Golden plover	Sept-Mar	2	HOL_190314_002_B001	80	✓	✓				
			HOL_190906_002_B002	1		✓				
			HOL_191003_001_B001	6				✓		
			HOL_191003_001_B003	7	✓					
			HOL_200130_003_B001	3		✓	✓			
			HOL_200130_003_B002	6	✓	✓	✓	✓		
			HOL_200130_003_B003	6	✓	✓	✓			
			HOL_200225_002_B002	1		✓				

Flight Activity recorded during MWPs

- 1.78. Thirty **curlew** flights were recorded, all during the spring migration period. Four were within 500 m of the proposed turbine locations (**Figure 9.1.15; Table 9.1.17**).

- 1.79. Eighteen **golden plover** flights were recorded involving 845 birds, seven (524 birds) were within 500 m of the proposed turbine locations (**Figure 9.1.15; Table 9.1.17**).
- 1.80. Four **dunlin** flights involving 225 birds were recorded, none of these flights passed within 500 m of the proposed turbines.

Table 9.1.17. Flight activity and elevation by wader species and which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during MWP watches.									
Species	Period	Flight Id	No. birds	Height category (m)					
				<10	10-30	30-50	50-100	100-150	>150
Curlew	Spring	HOL_180504_001_B003	1			✓			
		HOL_190501_002_B007	1		✓				
		HOL_190508_003_B003	1	✓	✓	✓	✓		
		HOL_180428_001_B002	2		✓				
Golden plover	Spring	HOL_180412_001_B001	150			✓	✓		
		HOL_180412_001_B002	110			✓			
		HOL_180412_001_B004	200			✓	✓		
		HOL_180403_001_B007	4		✓	✓			
	HOL_180403_001_B010	7	✓	✓	✓	✓			
	Autumn	HOL_180321_001_B002	28				✓		
HOL_181010_002_B014	25				✓	✓			

Skuas

Occurrence and Status

- 1.81. **Arctic skua** (*Stercorarius parasiticus*) and great skua (*Stercorarius skua*) were recorded; **arctic skua** is a Red-listed Bird of Conservation Concern.
- Flight Activity recorded during GVPs*
- 1.82. One **arctic skua** flight, involving one bird, was recorded, which passed within 500 m of the proposed turbine locations (**Figure 9.1.17; Table 9.1.18**).
- 1.83. Eight great skua flights (all single birds) were recorded all of which passed within 500 m of the proposed turbine locations (**Figure 9.1.17; Table 9.1.18**).

Table 9.1.18. Flight activity and elevation by skua species which occurred at least partly within the 500 m buffer of the proposed turbines (FA) recorded during GVP watches.										
Species	Period	GVP No.	Flight Id	No. birds	Height category (m)					
					<10	10-30	30-50	50-100	100-150	>150
Great skua	Apr-Aug	1	HOL_180530_001_B003	1				✓		
			HOL_180530_001_B004	1				✓		
			HOL_180604_001_B003	1			✓	✓	✓	
			HOL_180628_001_B001	1			✓	✓		
			HOL_180704_001_B001	1	✓	✓				
			HOL_180824_001_B001	1				✓		
			HOL_190508_001_B001	1				✓		
		2	HOL_180625_001_B002	1				✓		
Arctic skua	Apr-Aug	1	HOL_180621_001_B001	1				✓	✓	

Other Species of Interest

- 1.84. The breeding birds of open ground surveys located 10 skylark (*Alauda arvensis*) territories within the 500 m buffer of the proposed turbines (**Figure 9.1.13; Table 9.1.19**). Lapwing, herring gull (*Larus argentatus*), raven (*Corvus corax*) and buzzard (*Buteo buteo*) were the species recorded most often during the GVP watches (**Table 9.1.20**).

Table 9.1.19. Territory abundance of selected species recorded during the breeding bird surveys within the 500 m buffer of the turbines.	
Species	Maximum number of territories
Curlew	2
Golden plover	1
Lapwing	3
Ringed plover	1
Oystercatcher	2
Skylark	10

Table 9.1.20. The percentage of five-minute recording periods in which each species was encountered during watches from all GVPs. Total number of 5-minute recording intervals was 3456.

Species	Occurrence (%)	No. of 5-minute periods recorded
Lapwing	13.45	465
Herring gull	10.36	358
Raven	8.71	301
Buzzard	7.70	266
Curlew	2.49	86
Greylag goose	2.40	83
Oystercatcher	1.88	65
Snipe	1.62	56
Cuckoo	1.22	42
Red grouse	1.01	35
Hen harrier	0.64	22
Golden plover	0.41	14
Sparrowhawk	0.29	10
Pink-footed goose	0.29	10
Great black-backed gull	0.26	9
Great skua	0.23	8
Whooper swan	0.23	8
Kestrel	0.23	8
Jackdaw	0.17	6
Grey heron	0.12	4
Goose sp.	0.09	3
Crane	0.03	1
Dunlin	0.03	1
Merlin	0.03	1
Red kite	0.03	1
Cormorant	0.03	1
Arctic skua	0.03	1

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Annexes

Annex 9.1.1 Recording Periods used in Diurnal Stratification of Watches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Early GVPs finish by / Middle GVPs begin from	0930	0900	0830*	0830	0745	0730	0800	0830	0900	0930**	0900	0930
Middle GVPs finish by / Late GVPs begin from	1500	1600	1630*	1800	1900	1900	1900	1830	1730	1630**	1500	1430
	GMT	GMT	GMT	BST	GMT	GMT						

*This time is GMT, when the clocks changed time was kept in line with this, within the month.

** This time is BST, when the clocks changed time was kept in line with this, within the month.

Annex 9.1.2 Generic Vantage Point Survey Information

***Watch ID relates to Annex 9.1.3 Weather Details**

Date	Observer	VP	Start	End	Duration	Watch ID*
24/04/2018	NR	GVP1	0650	0920	2.50	HOL_180424_001
13/04/2018	PS	GVP1	1135	1405	2.50	HOL_180413_001
04/04/2018	PR	GVP1	1125	1425	3.00	HOL_180404_001
04/04/2018	PR	GVP2	1500	1800	3.00	HOL_180404_002
11/04/2018	PS	GVP2	1735	2005	2.50	HOL_180411_001
24/04/2018	NR	GVP2	1005	1235	2.50	HOL_180424_002
01/05/2018	PS	GVP1	1820	2120	3.00	HOL_180501_001
07/05/2018	PS	GVP1	1625	1855	2.50	HOL_180507_001
30/05/2018	PR	GVP1	0845	1115	2.50	HOL_180530_001
01/05/2018	PS	GVP2	1435	1735	3.00	HOL_180501_002
11/05/2018	PS	GVP2	0510	0740	2.50	HOL_180511_001
30/05/2018	PR	GVP2	1145	1415	2.50	HOL_180530_002
04/06/2018	JD	GVP1	1500	1800	3.00	HOL_180604_001
21/06/2018	JD	GVP1	0430	0700	2.50	HOL_180621_001
28/06/2018	JD	GVP1	0830	1100	2.50	HOL_180628_001
07/06/2018	JD	GVP2	0800	1100	3.00	HOL_180607_001
21/06/2018	JD	GVP2	0730	1000	2.50	HOL_180621_002
25/06/2018	JD	GVP2	1930	2200	2.50	HOL_180625_001
04/07/2018	NR	GVP1	1045	1345	3.00	HOL_180704_001
26/07/2018	JD	GVP1	1800	2100	3.00	HOL_180726_001
11/07/2018	NR	GVP2	0620	0920	3.00	HOL_180711_001
26/07/2018	JD	GVP2	1430	1730	3.00	HOL_180726_002
24/08/2018	PR	GVP1	0720	1020	3.00	HOL_180824_001
30/08/2018	PS	GVP1	1340	1640	3.00	HOL_180830_001
27/08/2018	NR	GVP2	1520	1820	3.00	HOL_180827_001
30/08/2018	PS	GVP2	1710	2010	3.00	HOL_180830_002
05/09/2018	PS	GVP1	1610	1910	3.00	HOL_180905_001
27/09/2018	PS	GVP1	1420	1720	3.00	HOL_180927_001
05/09/2018	PS	GVP2	1230	1530	3.00	HOL_180905_002
26/09/2018	PS	GVP2	0720	1020	3.00	HOL_180926_001
10/10/2018	NR	GVP1	1140	1440	3.00	HOL_181010_001
23/10/2018	NR	GVP1	0820	1120	3.00	HOL_181023_001
01/10/2018	PS	GVP2	1440	1740	3.00	HOL_181001_001
17/10/2018	PS	GVP2	1215	1515	3.00	HOL_181017_001
05/11/2018	PS	GVP1	1400	1630	2.50	HOL_181105_001
18/11/2018	PS	GVP1	0750	1020	2.50	HOL_181118_001
07/11/2018	PS	GVP2	1345	1615	2.50	HOL_181107_001
22/11/2018	PS	GVP2	0815	1045	2.50	HOL_181122_001
04/12/2018	PS	GVP1	0850	1050	2.00	HOL_181204_001
16/12/2018	PS	GVP1	1030	1230	2.00	HOL_181216_001
04/12/2018	PS	GVP2	1120	1320	2.00	HOL_181204_002
16/12/2018	PS	GVP2	1310	1510	2.00	HOL_181216_002
14/01/2019	PS	GVP1	0920	1120	2.00	HOL_190114_001
28/01/2019	PS	GVP1	1400	1600	2.00	HOL_190128_001
28/01/2019	PS	GVP2	0830	1030	2.00	HOL_190128_002
28/01/2019	PS	GVP2	1100	1300	2.00	HOL_190128_003

Date	Observer	VP	Start	End	Duration	Watch ID*
06/02/2019	PS	GVP1	0755	1025	2.50	HOL_190206_001
13/02/2019	PS	GVP1	1030	1300	2.50	HOL_190213_001
06/02/2019	PS	GVP2	1110	1340	2.50	HOL_190206_002
13/02/2019	PS	GVP2	1400	1630	2.50	HOL_190213_002
14/03/2019	NR	GVP1	1020	1320	3.00	HOL_190314_001
21/03/2019	PS	GVP1	1500	1800	3.00	HOL_190321_001
14/03/2019	NR	GVP2	0650	0950	3.00	HOL_190314_002
27/03/2019	PS	GVP2	1330	1630	3.00	HOL_190327_001
01/04/2019	PS	GVP1	1315	1615	3.00	HOL_190401_001
09/04/2019	JD	GVP1	0630	0900	2.50	HOL_190409_001
15/04/2019	JD	GVP1	1230	1500	2.50	HOL_190415_001
01/04/2019	PS	GVP2	0945	1245	3.00	HOL_190401_002
04/04/2019	PS	GVP2	1700	1930	2.50	HOL_190404_001
08/04/2019	PS	GVP2	0845	1115	2.50	HOL_190408_001
01/05/2019	JD	GVP1	1900	2130	2.50	HOL_190501_001
06/05/2019	JD	GVP1	0900	1200	3.00	HOL_190506_001
08/05/2019	JD	GVP1	1630	1900	2.50	HOL_190508_001
06/05/2019	JD	GVP2	0600	0830	2.50	HOL_190506_002
08/05/2019	JD	GVP2	1300	1600	3.00	HOL_190508_002
14/05/2019	JD	GVP2	1530	1800	2.50	HOL_190514_001
04/06/2019	JD	GVP1	1530	1830	3.00	HOL_190604_001
06/06/2019	JD	GVP1	0530	0800	2.50	HOL_190606_001
18/06/2019	JD	GVP1	1200	1430	2.50	HOL_190618_001
04/06/2019	JD	GVP2	1900	2130	2.50	HOL_190604_002
18/06/2019	JD	GVP2	0830	1130	3.00	HOL_190618_002
29/06/2019	JD	GVP2	1220	1450	2.50	HOL_190629_001
02/07/2019	PS	GVP1	1340	1640	3.00	HOL_190702_001
15/07/2019	PS	GVP1	0915	1215	3.00	HOL_190715_001
02/07/2019	PS	GVP2	1010	1310	3.00	HOL_190702_002
15/07/2019	PS	GVP2	1315	1615	3.00	HOL_190715_002
20/08/2019	RAS	GVP1	1630	1830	2.00	HOL_190820_001
20/08/2019	RAS	GVP1	1830	1930	1.00	HOL_190820_002
21/08/2019	RAS	GVP1	0930	1230	3.00	HOL_190821_001
19/08/2019	RAS	GVP2	1630	1830	2.00	HOL_190819_001
19/08/2019	RAS	GVP2	1830	1930	1.00	HOL_190819_002
20/08/2019	RAS	GVP2	1300	1600	3.00	HOL_190820_003
06/09/2019	PS	GVP1	1100	1400	3.00	HOL_190906_001
21/09/2019	PS	GVP1	1530	1830	3.00	HOL_190921_001
06/09/2019	PS	GVP2	1430	1730	3.00	HOL_190906_002
19/09/2019	PS	GVP2	0650	0950	3.00	HOL_190919_001
09/10/2019	PS	GVP1	1430	1730	3.00	HOL_191009_001
14/10/2019	PS	GVP1	1130	1430	3.00	HOL_191014_001
03/10/2019	PS	GVP2	1030	1330	3.00	HOL_191003_001
11/10/2019	PS	GVP2	1520	1820	3.00	HOL_191011_001
01/11/2019	PS	GVP1	0740	1010	2.50	HOL_191101_001
28/11/2019	PS	GVP1	1000	1230	2.50	HOL_191128_001
18/11/2019	PS	GVP2	0750	1020	2.50	HOL_191118_001
26/11/2019	PS	GVP2	1230	1500	2.50	HOL_191126_001
19/12/2019	AA	GVP1	0900	0930	0.50	HOL_191219_001
19/12/2019	AA	GVP1	0930	1100	1.50	HOL_191219_002
20/12/2019	AA	GVP1	1120	1320	2.00	HOL_191220_001

Date	Observer	VP	Start	End	Duration	Watch ID*
19/12/2019	AA	GVP2	1150	1350	2.00	HOL_191219_003
20/12/2019	AA	GVP2	0850	0930	0.67	HOL_191220_002
20/12/2019	AA	GVP2	0930	1050	1.33	HOL_191220_003
29/01/2020	RAS	GVP1	1015	1215	2.00	HOL_200129_001
30/01/2020	RAS	GVP1	1330	1500	1.50	HOL_200130_001
30/01/2020	RAS	GVP1	1500	1530	0.50	HOL_200130_002
29/01/2020	RAS	GVP2	1245	1445	2.00	HOL_200129_002
30/01/2020	RAS	GVP2	1000	1200	2.00	HOL_200130_003
23/02/2020	PS	GVP1	1330	1600	2.50	HOL_200223_001
25/02/2020	PS	GVP1	0915	1145	2.50	HOL_200225_001
23/02/2020	PS	GVP2	1000	1230	2.50	HOL_200223_002
25/02/2020	PS	GVP2	1245	1515	2.50	HOL_200225_002
06/03/2020	PS	GVP1	1200	1500	3.00	HOL_200306_001
12/03/2020	PS	GVP1	0800	1100	3.00	HOL_200312_001
06/03/2020	PS	GVP2	0830	1130	3.00	HOL_200306_002
12/03/2020	PS	GVP2	1300	1600	3.00	HOL_200312_002

Annex 9.1.3 Weather details for GVP Watches

Precipitation Codes: Continuous / Intermittent + Light / Heavy + Rain / Snow / Hail / Fog

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_180424_001	0	9	1000	W	3	nil	20
HOL_180424_001	1	9	1000	W	3	ILR	20
HOL_180424_001	2	5	1000	W	4	nil	20
HOL_180424_001	3	7	1000	W	4	nil	20
HOL_180413_001	0	10	500	NE	3	ILR	5
HOL_180413_001	1	10	500	NE	3	ILR	5
HOL_180413_001	2	10	500	NE	3	nil	5
HOL_180413_001	3	10	500	NE	3	nil	5
HOL_180404_001	0	5	1000	NW	2	nil	20
HOL_180404_001	1	5	1000	NW	2	nil	20
HOL_180404_001	2	4	1000	NW	3	nil	20
HOL_180404_001	3	7	1000	NW	3	nil	20
HOL_180404_002	0	5	1000	NW	3	nil	20
HOL_180404_002	1	6	1000	NW	3	nil	20
HOL_180404_002	2	4	1000	WNW	3	nil	20
HOL_180404_002	3	3	1000	WNW	2	nil	20
HOL_180411_001	0	10	500	E	5	nil	5
HOL_180411_001	1	10	500	E	5	nil	5
HOL_180411_001	2	10	500	NE	5	nil	5
HOL_180411_001	3	10	500	E	5	nil	5
HOL_180424_002	0	8	1000	W	4	nil	20
HOL_180424_002	1	8	1000	W	4	nil	20
HOL_180424_002	2	7	1000	W	4	nil	20
HOL_180424_002	3	6	1000	W	4	nil	20
HOL_180501_001	0	0	-	E	1	nil	20
HOL_180501_001	1	0	-	E	1	nil	20
HOL_180501_001	2	1	1000	nil	0	nil	20
HOL_180501_001	3	1	1000	nil	0	nil	20
HOL_180507_001	0	10	1000	E	5	nil	5
HOL_180507_001	1	9	1000	E	5	nil	5
HOL_180507_001	2	8	1000	E	5	nil	5
HOL_180507_001	3	4	1000	E	4	nil	5
HOL_180530_001	0	10	500	nil	0	nil	10
HOL_180530_001	1	10	500	nil	0	nil	10
HOL_180530_001	2	8	1000	nil	0	nil	15
HOL_180530_001	3	4	1000	nil	0	nil	20
HOL_180501_002	0	1	1000	NE	3	nil	10
HOL_180501_002	1	0	1000	NE	2	nil	10
HOL_180501_002	2	0	1000	NE	3	nil	10
HOL_180501_002	3	1	1000	NE	3	nil	10
HOL_180511_001	0	2	1000	SSE	1	nil	10
HOL_180511_001	1	2	1000	SSE	3	nil	10
HOL_180511_001	2	1	1000	SE	3	nil	10
HOL_180511_001	3	1	1000	SE	3	nil	10
HOL_180530_002	0	2	1000	NE	2	nil	20

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_180530_002	1	1	1000	NE	1	nil	20
HOL_180530_002	2	1	1000	NE	1	nil	20
HOL_180530_002	3	1	1000	NE	1	nil	20
HOL_180604_001	0	10	1000	N	2	nil	15
HOL_180604_001	1	10	1000	N	2	nil	15
HOL_180604_001	2	10	500	NE	2	nil	15
HOL_180604_001	3	10	1000	N	2	nil	15
HOL_180621_001	0	5	1000	N	2	nil	15
HOL_180621_001	1	6	1000	N	3	nil	15
HOL_180621_001	2	3	1000	N	4	nil	15
HOL_180621_001	3	9	1000	N	4	nil	15
HOL_180628_001	0	1	1000	W	2	nil	20
HOL_180628_001	1	1	1000	W	2	nil	20
HOL_180628_001	2	0	-	W	2	nil	20
HOL_180628_001	3	0	-	W	2	nil	20
HOL_180607_001	0	3	1000	SE	1	nil	15
HOL_180607_001	1	3	1000	SE	1	nil	15
HOL_180607_001	2	2	1000	SE	1	nil	15
HOL_180607_001	3	2	1000	SE	2	nil	15
HOL_180621_002	0	10	1000	W	2	ILR	15
HOL_180621_002	1	10	1000	W	3	nil	15
HOL_180621_002	2	10	1000	W	3	ILR	15
HOL_180621_002	3	10	1000	W	3	ILR	15
HOL_180625_001	0	10	1000	NW	1	nil	15
HOL_180625_001	1	10	1000	NW	0	nil	15
HOL_180625_001	2	10	1000	NW	1	nil	15
HOL_180625_001	3	10	1000	NW	1	nil	15
HOL_180704_001	0	3	1000	SE	4	nil	20
HOL_180704_001	1	2	1000	SE	4	nil	20
HOL_180704_001	2	2	1000	SE	4	nil	20
HOL_180704_001	3	1	1000	SE	3	nil	20
HOL_180726_001	0	0	-	SE	3	nil	20
HOL_180726_001	1	0	-	SE	3	nil	20
HOL_180726_001	2	0	-	SE	2	nil	20
HOL_180726_001	3	0	-	SE	3	nil	20
HOL_180711_001	0	10	100	NW	1	nil	2
HOL_180711_001	1	10	100	N	1	nil	3
HOL_180711_001	2	10	300	N	1	nil	5
HOL_180711_001	3	10	300	N	1	nil	10
HOL_180726_002	0	1	1000	SE	4	nil	15
HOL_180726_002	1	1	1000	SE	4	nil	15
HOL_180726_002	2	1	1000	SE	3	nil	15
HOL_180726_002	3	0	-	SE	3	nil	15
HOL_180824_001	0	9	300	WNW	2	IHR	20
HOL_180824_001	1	9	500	WNW	2	IHR	20
HOL_180824_001	2	8	500	WNW	2	ILR	20
HOL_180824_001	3	8	500	WNW	2	ILR	20
HOL_180830_001	0	7	1000	SW	2	nil	10

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_180830_001	1	7	1000	SW	1	nil	10
HOL_180830_001	2	5	1000	SW	1	nil	10
HOL_180830_001	3	2	1000	SW	1	nil	10
HOL_180827_001	0	6	1000	NW	3	nil	20
HOL_180827_001	1	5	1000	NW	3	nil	20
HOL_180827_001	2	5	1000	NW	2	nil	20
HOL_180827_001	3	3	1000	NW	3	nil	20
HOL_180830_002	0	5	1000	nil	0	nil	5
HOL_180830_002	1	7	1000	nil	0	nil	5
HOL_180830_002	2	9	1000	nil	0	nil	5
HOL_180830_002	3	3	1000	nil	0	nil	5
HOL_180905_001	0	10	1000	SE	3	nil	10
HOL_180905_001	1	10	1000	SE	3	nil	10
HOL_180905_001	2	10	1000	SE	3	nil	10
HOL_180905_001	3	10	1000	SE	3	ILR	10
HOL_180927_001	0	8	1000	N	3	nil	10
HOL_180927_001	1	9	1000	NNW	4	ILR	10
HOL_180927_001	2	7	1000	NW	3	nil	10
HOL_180927_001	3	5	1000	NW	3	nil	10
HOL_180905_002	0	7	1000	S	2	nil	10
HOL_180905_002	1	6	1000	SE	3	nil	10
HOL_180905_002	2	9	1000	SE	3	nil	10
HOL_180905_002	3	10	1000	ESE	3	nil	10
HOL_180926_001	0	10	500	NW	4	ILR	2
HOL_180926_001	1	10	500	W	3	ILR	2
HOL_180926_001	2	10	500	W	3	nil	5
HOL_180926_001	3	10	500	W	3	nil	5
HOL_181010_001	0	1	1000	S	4	nil	20
HOL_181010_001	1	0	1000	S	4	nil	20
HOL_181010_001	2	0	1000	S	4	nil	20
HOL_181010_001	3	0	1000	S	4	nil	20
HOL_181023_001	0	10	400	NW	7	CLR	5
HOL_181023_001	1	10	400	NW	7	CLR	5
HOL_181023_001	2	10	400	NW	7	ILR	10
HOL_181023_001	3	9	400	NW	6	nil	10
HOL_181001_001	0	10	1000	W	2	CLR	5
HOL_181001_001	1	10	1000	nil	0	CLR	5
HOL_181001_001	2	10	1000	nil	0	nil	5
HOL_181001_001	3	10	1000	W	1	ILR	5
HOL_181017_001	0	7	1000	SW	2	ILR	10
HOL_181017_001	1	4	1000	SW	2	ILR	10
HOL_181017_001	2	5	1000	SW	3	nil	10
HOL_181017_001	3	1	1000	SW	3	nil	10
HOL_181105_001	0	10	1000	nil	0	nil	5
HOL_181105_001	1	10	1000	nil	0	nil	5
HOL_181105_001	2	10	1000	nil	0	ILR	5
HOL_181105_001	3	10	1000	nil	0	nil	5
HOL_181118_001	0	0	-	ESE	4	nil	10

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_181118_001	1	0	-	ESE	2	nil	10
HOL_181118_001	2	0	-	SE	2	nil	10
HOL_181118_001	3	0	-	SE	2	nil	10
HOL_181107_001	0	10	1000	SE	5	nil	5
HOL_181107_001	1	9	1000	SE	5	nil	5
HOL_181107_001	2	10	1000	SE	5	nil	5
HOL_181107_001	3	10	1000	SE	5	ILR	5
HOL_181122_001	0	10	1000	ESE	2	nil	5
HOL_181122_001	1	10	1000	E	3	ILR	5
HOL_181122_001	2	10	1000	E	2	ILR	5
HOL_181122_001	3	10	1000	E	2	ILR	5
HOL_181204_001	0	10	1000	nil	0	ILR	5
HOL_181204_001	1	10	1000	nil	0	ILR	5
HOL_181204_001	2	7	1000	nil	0	nil	10
HOL_181216_001	0	10	1000	S	2	nil	5
HOL_181216_001	1	10	1000	S	3	nil	5
HOL_181216_001	2	9	1000	S	2	nil	5
HOL_181204_002	0	8	1000	nil	0	nil	10
HOL_181204_002	1	7	1000	nil	0	nil	10
HOL_181204_002	2	0	-	nil	0	nil	10
HOL_181216_002	0	9	1000	SW	2	nil	10
HOL_181216_002	1	6	1000	W	1	nil	10
HOL_181216_002	2	1	1000	W	1	nil	10
HOL_190114_001	0	4	1000	S	1	nil	10
HOL_190114_001	1	9	1000	SSE	2	nil	10
HOL_190114_001	2	9	1000	SSE	2	nil	10
HOL_190128_001	0	9	1000	SW	2	nil	10
HOL_190128_001	1	9	1000	SW	2	ILR	10
HOL_190128_001	2	9	1000	NW	3	ILR	10
HOL_190128_002	0	4	1000	nil	0	nil	10
HOL_190128_002	1	6	1000	nil	0	nil	10
HOL_190128_002	2	8	1000	nil	0	ILR	10
HOL_190128_003	0	9	1000	N	0	nil	10
HOL_190128_003	1	10	1000	W	3	ILR	10
HOL_190128_003	2	10	1000	W	3	nil	5
HOL_190206_001	0	2	1000	E	2	nil	10
HOL_190206_001	1	2	1000	SE	2	nil	10
HOL_190206_001	2	3	1000	SE	2	nil	10
HOL_190206_001	3	4	1000	ESE	3	nil	10
HOL_190213_001	0	6	1000	SE	3	nil	10
HOL_190213_001	1	8	1000	SE	3	nil	10
HOL_190213_001	2	2	1000	SE	3	nil	10
HOL_190213_001	3	1	1000	S	3	nil	10
HOL_190206_002	0	6	1000	S	2	nil	10
HOL_190206_002	1	2	1000	S	2	nil	10
HOL_190206_002	2	6	1000	S	2	nil	10
HOL_190206_002	3	4	1000	S	1	nil	10
HOL_190213_002	0	9	1000	SW	3	nil	10

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_190213_002	1	7	1000	SW	2	nil	10
HOL_190213_002	2	9	1000	SW	2	nil	10
HOL_190213_002	3	10	1000	SW	2	nil	10
HOL_190314_001	0	8	700	NW	4	nil	20
HOL_190314_001	1	8	700	NW	4	IHR	20
HOL_190314_001	2	7	700	NW	5	nil	20
HOL_190314_001	3	6	700	NW	5	nil	20
HOL_190321_001	0	9	1000	NE	1	nil	10
HOL_190321_001	1	9	1000	nil	0	nil	10
HOL_190321_001	2	9	1000	nil	0	nil	10
HOL_190321_001	3	6	1000	NE	2	nil	10
HOL_190314_002	0	9	700	NW	3	nil	10
HOL_190314_002	1	9	700	NW	4	IHR	10
HOL_190314_002	2	9	700	NW	3	IHR	10
HOL_190314_002	3	8	700	NW	3	nil	10
HOL_190327_001	0	10	1000	W	3	nil	5
HOL_190327_001	1	10	1000	SW	3	nil	5
HOL_190327_001	2	9	1000	W	3	nil	5
HOL_190327_001	3	9	1000	W	2	nil	5
HOL_190401_001	0	9	1000	SE	4	nil	10
HOL_190401_001	1	7	1000	SE	4	nil	10
HOL_190401_001	2	10	1000	SE	4	nil	10
HOL_190401_001	3	10	1000	SE	4	nil	10
HOL_190409_001	0	1	1000	SE	1	nil	5
HOL_190409_001	1	1	1000	SE	1	nil	5
HOL_190409_001	2	1	1000	SE	2	nil	5
HOL_190409_001	3	1	1000	SE	2	nil	5
HOL_190415_001	0	8	1000	SE	4	nil	5
HOL_190415_001	1	9	1000	E	4	nil	5
HOL_190415_001	2	10	500	E	4	nil	5
HOL_190415_001	3	10	500	E	4	nil	5
HOL_190401_002	0	2	1000	S	3	nil	10
HOL_190401_002	1	2	1000	S	3	nil	10
HOL_190401_002	2	3	1000	SSW	3	nil	10
HOL_190401_002	3	7	1000	S	3	nil	10
HOL_190404_001	0	9	1000	SE	2	nil	10
HOL_190404_001	1	10	1000	SE	1	nil	10
HOL_190404_001	2	10	1000	SE	1	nil	10
HOL_190404_001	3	10	1000	SE	0	nil	10
HOL_190408_001	0	10	1000	nil	0	nil	5
HOL_190408_001	1	10	1000	nil	0	nil	5
HOL_190408_001	2	10	1000	NE	1	nil	5
HOL_190408_001	3	10	1000	NE	1	nil	5
HOL_190501_001	0	10	1000	NE	2	nil	5
HOL_190501_001	1	10	1000	N	2	nil	5
HOL_190501_001	2	10	1000	N	1	nil	5
HOL_190501_001	3	10	1000	N	1	nil	5
HOL_190506_001	0	3	1000	NE	2	nil	5

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_190506_001	1	6	1000	NE	3	nil	5
HOL_190506_001	2	7	500	ENE	2	nil	5
HOL_190506_001	3	7	500	NE	2	IHR	5
HOL_190508_001	0	9	1000	SE	2	nil	5
HOL_190508_001	1	10	1000	SE	2	nil	5
HOL_190508_001	2	10	1000	SE	2	nil	5
HOL_190508_001	3	10	1000	SE	2	nil	5
HOL_190506_002	0	3	1000	NW	1	nil	5
HOL_190506_002	1	4	1000	NW	1	nil	5
HOL_190506_002	2	3	1000	NW	1	nil	5
HOL_190506_002	3	6	1000	SE	1	nil	5
HOL_190508_002	0	10	500	SE	2	ILR	5
HOL_190508_002	1	10	1000	E	2	ILR	5
HOL_190508_002	2	9	1000	E	1	nil	5
HOL_190508_002	3	10	1000	E	2	nil	5
HOL_190514_001	0	0	9999	SE	1	nil	5
HOL_190514_001	1	0	9999	SE	1	nil	5
HOL_190514_001	2	2	1000	SE	1	nil	5
HOL_190514_001	3	1	1000	SE	2	nil	5
HOL_190604_001	0	10	1000	NW	1	nil	5
HOL_190604_001	1	10	1000	NW	1	nil	5
HOL_190604_001	2	10	1000	NW	1	nil	5
HOL_190604_001	3	10	1000	NW	1	nil	5
HOL_190606_001	0	10	1000	NW	2	nil	5
HOL_190606_001	1	10	500	NW	2	nil	5
HOL_190606_001	2	10	500	NW	1	nil	5
HOL_190606_001	3	10	500	NW	1	nil	5
HOL_190618_001	0	10	1000	SW	2	ILR	5
HOL_190618_001	1	10	1000	SW	2	ILR	5
HOL_190618_001	2	10	500	SW	3	ILR	5
HOL_190618_001	3	10	1000	SW	2	nil	5
HOL_190604_002	0	10	1000	NW	1	nil	5
HOL_190604_002	1	10	1000	NW	1	nil	5
HOL_190604_002	2	10	1000	nil	0	nil	5
HOL_190618_002	0	10	500	SW	1	ILR	5
HOL_190618_002	1	10	500	SW	1	ILR	5
HOL_190618_002	2	10	1000	SW	2	ILR	5
HOL_190618_002	3	10	1000	SW	1	ILR	5
HOL_190629_001	0	6	1000	SW	4	nil	3
HOL_190629_001	1	6	1000	SW	4	nil	3
HOL_190629_001	2	6	1000	SW	4	ILR	3
HOL_190629_001	3	6	1000	SW	4	nil	3
HOL_190702_001	0	8	1000	S	3	nil	5
HOL_190702_001	1	6	1000	S	3	nil	5
HOL_190702_001	2	4	1000	SW	3	nil	5
HOL_190702_001	3	6	1000	SW	3	nil	5
HOL_190715_001	0	3	1000	nil	0	nil	5
HOL_190715_001	1	4	1000	nil	0	nil	5

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_190715_001	2	1	1000	nil	0	nil	5
HOL_190715_001	3	0	9999	nil	0	nil	5
HOL_190702_002	0	9	1000	SW	2	nil	10
HOL_190702_002	1	10	1000	SW	2	ILR	10
HOL_190702_002	2	10	1000	SW	2	nil	10
HOL_190702_002	3	10	1000	SW	2	nil	10
HOL_190715_002	0	0	-	E	1	nil	5
HOL_190715_002	1	0	-	E	1	nil	5
HOL_190715_002	2	0	-	nil	0	nil	5
HOL_190715_002	3	0	-	nil	0	nil	5
HOL_190820_001	0	8	800	WNW	3	nil	5
HOL_190820_001	1	7	800	WNW	3	nil	5
HOL_190820_001	2	5	800	WNW	3	nil	5
HOL_190820_002	0	4	800	WNW	3	nil	5
HOL_190820_002	1	5	800	WNW	1	nil	5
HOL_190821_001	0	7	700	SSW	4	nil	5
HOL_190821_001	1	6	800	SSW	4	nil	5
HOL_190821_001	2	7	800	SSW	4	nil	5
HOL_190821_001	3	7	800	SSW	5	nil	5
HOL_190819_001	0	8	500	SW	4	nil	5
HOL_190819_001	1	9	300	SW	4	nil	5
HOL_190819_001	2	10	200	SW	4	ILR	5
HOL_190819_002	0	10	200	SW	4	ILR	4
HOL_190819_002	1	10	300	SW	4	nil	4
HOL_190820_003	0	7	600	WSW	4	nil	5
HOL_190820_003	1	7	600	WSW	4	nil	5
HOL_190820_003	2	7	600	WSW	4	nil	5
HOL_190820_003	3	8	700	WSW	3	nil	5
HOL_190906_001	0	10	1000	W	2	nil	5
HOL_190906_001	1	10	500	NW	2	ILR	3
HOL_190906_001	2	10	900	NW	3	IHR	3
HOL_190906_001	3	7	1000	NNW	4	nil	5
HOL_190921_001	0	0	-	SW	4	nil	5
HOL_190921_001	1	0	-	SSW	4	nil	5
HOL_190921_001	2	0	-	SSW	4	nil	5
HOL_190921_001	3	0	-	SSW	4	nil	5
HOL_190906_002	0	9	1000	N	2	nil	5
HOL_190906_002	1	9	1000	N	2	nil	5
HOL_190906_002	2	10	1000	N	2	nil	5
HOL_190906_002	3	10	1000	nil	0	nil	5
HOL_190919_001	0	10	500	nil	0	nil	3
HOL_190919_001	1	10	500	nil	0	nil	3
HOL_190919_001	2	10	1000	nil	0	nil	5
HOL_190919_001	3	10	1000	W	1	nil	5
HOL_191009_001	0	10	1000	SE	3	nil	3
HOL_191009_001	1	9	1000	SE	3	nil	3
HOL_191009_001	2	9	1000	SE	3	nil	3
HOL_191009_001	3	10	1000	SE	3	nil	3

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_191014_001	0	9	1000	E	1	nil	3
HOL_191014_001	1	9	1000	E	1	nil	3
HOL_191014_001	2	8	1000	E	2	nil	3
HOL_191014_001	3	9	1000	E	2	nil	3
HOL_191003_001	0	10	1000	E	1	nil	3
HOL_191003_001	1	10	1000	E	2	nil	3
HOL_191003_001	2	10	1000	E	2	nil	3
HOL_191003_001	3	10	1000	E	2	nil	3
HOL_191011_001	0	10	1000	nil	0	ILR	3
HOL_191011_001	1	10	1000	nil	0	ILR	3
HOL_191011_001	2	10	1000	SW	3	ILR	3
HOL_191011_001	3	10	1000	nil	0	ILR	3
HOL_191101_001	0	10	1000	NE	2	nil	3
HOL_191101_001	1	10	1000	NE	2	nil	3
HOL_191101_001	2	10	1000	NE	2	nil	3
HOL_191101_001	3	10	1000	NE	2	nil	3
HOL_191128_001	0	4	1000	NE	4	nil	3
HOL_191128_001	1	2	1000	NE	4	nil	3
HOL_191128_001	2	5	1000	NE	4	nil	3
HOL_191128_001	3	6	1000	NE	4	nil	3
HOL_191118_001	0	4	1000	nil	0	nil	3
HOL_191118_001	1	1	1000	nil	0	nil	3
HOL_191118_001	2	0	-	nil	0	nil	3
HOL_191118_001	3	0	-	nil	0	nil	3
HOL_191126_001	0	10	500	E	3	nil	3
HOL_191126_001	1	10	500	E	3	nil	3
HOL_191126_001	2	10	1000	E	3	nil	3
HOL_191126_001	3	10	1000	E	3	nil	3
HOL_191219_001	0	10	1000	SE	4	nil	20
HOL_191219_001	1	10	1000	SE	4	nil	20
HOL_191219_002	0	10	1000	SE	4	nil	20
HOL_191219_002	1	10	1000	SE	4	nil	20
HOL_191219_002	2	10	1000	SE	4	nil	20
HOL_191220_001	0	3	1000	SE	4	nil	20
HOL_191220_001	1	4	1000	SE	4	nil	20
HOL_191220_001	2	4	1000	SE	4	nil	20
HOL_191220_001	3	4	1000	SE	4	nil	20
HOL_191219_003	0	6	1000	SE	5	nil	20
HOL_191219_003	1	5	1000	SE	4	nil	20
HOL_191219_003	2	6	1000	SE	4	nil	20
HOL_191220_002	0	2	1000	SE	5	nil	20
HOL_191220_002	1	3	1000	SE	5	nil	20
HOL_191220_003	0	3	1000	SE	5	nil	20
HOL_191220_003	1	3	1000	SE	5	nil	20
HOL_200129_001	0	6	600	W	4	nil	5
HOL_200129_001	1	10	600	W	3	nil	5
HOL_200129_001	2	10	600	SW	3	nil	5
HOL_200130_001	0	7	700	SW	5	nil	5

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Dir.	Wind Force	Precipitation	Visibility (km)
HOL_200130_001	1	9	400	SW	5	IHR	4
HOL_200130_002	0	9	600	SW	4	ILR	4
HOL_200129_002	0	9	600	SW	3	nil	5
HOL_200129_002	1	10	600	SW	3	nil	5
HOL_200129_002	2	10	600	SW	2	nil	5
HOL_200130_003	0	10	600	SSW	4	CLR	5
HOL_200130_003	1	10	600	SSW	4	ILR	5
HOL_200130_003	2	10	700	SSW	4	nil	5
HOL_200223_001	0	8	1000	SW	4	nil	3
HOL_200223_001	1	8	1000	SW	4	nil	3
HOL_200223_001	2	6	1000	SW	4	nil	3
HOL_200225_001	0	9	1000	nil	0	nil	3
HOL_200225_001	1	4	1000	nil	0	nil	3
HOL_200225_001	2	7	1000	nil	0	nil	3
HOL_200225_001	3	5	1000	SE	1	nil	3
HOL_200223_002	0	3	1000	SW	3	nil	3
HOL_200223_002	1	1	1000	SW	3	nil	3
HOL_200223_002	2	9	1000	SW	3	ILR	3
HOL_200223_002	3	10	1000	SW	3	nil	3
HOL_200225_002	0	6	1000	nil	0	nil	3
HOL_200225_002	1	7	1000	nil	0	nil	3
HOL_200225_002	2	8	1000	nil	0	nil	3
HOL_200225_002	3	7	1000	nil	0	nil	3
HOL_200306_001	0	10	1000	SE	1	nil	3
HOL_200306_001	1	10	1000	SE	1	nil	3
HOL_200306_001	2	8	1000	SE	1	nil	3
HOL_200306_001	3	3	1000	SE	1	nil	3
HOL_200312_001	0	1	1000	E	2	nil	3
HOL_200312_001	1	7	1000	E	2	nil	3
HOL_200312_001	2	9	1000	E	1	nil	3
HOL_200312_001	3	7	1000	nil	0	nil	3
HOL_200306_002	0	1	1000	nil	0	nil	3
HOL_200306_002	1	1	1000	nil	0	nil	3
HOL_200306_002	2	9	1000	E	1	nil	3
HOL_200306_002	3	10	1000	E	1	nil	3
HOL_200312_002	0	7	1000	nil	0	nil	3
HOL_200312_002	1	8	1000	nil	0	nil	3
HOL_200312_002	2	6	1000	nil	0	nil	3
HOL_200312_002	3	5	1000	nil	0	nil	3

Annex 9.1.4 Migration Watch Point Survey Information***Watch ID relates to Appendix 9.1.5 Weather Details**

Date	Observer	VP	Start	Finish	Duration	Watch ID*
22/03/2018	NR	MWPA	0645	0945	3.00	HOL_180322_001
21/03/2018	PR	MWPA	1045	1345	3.00	HOL_180321_001
28/03/2018	NR	MWPA	1340	1640	3.00	HOL_180328_001
02/04/2018	PS	MWPC	1145	1445	3.00	HOL_180402_001
03/04/2018	PR	MWPC	1120	1420	3.00	HOL_180403_001
06/04/2018	PS	MWPC	0620	0920	3.00	HOL_180406_001
12/04/2018	NR	MWPA	1205	1505	3.00	HOL_180412_001
13/04/2018	PS	MWPC	1435	1735	3.00	HOL_180413_002
25/04/2018	PS	MWPC	1300	1600	3.00	HOL_180425_001
28/04/2018	PR	MWPC	1010	1310	3.00	HOL_180428_001
04/05/2018	NR	MWPA	0820	1120	3.00	HOL_180504_001
08/05/2018	JD	MWPC	0725	1025	3.00	HOL_180508_001
18/09/2018	NR	MWPA	0915	1215	3.00	HOL_180918_001
19/09/2018	NR	MWPA	1145	1445	3.00	HOL_180919_001
26/09/2018	PS	MWPB	1050	1350	3.00	HOL_180926_002
27/09/2018	PS	MWPB	1050	1350	3.00	HOL_180927_002
01/10/2018	PS	MWPB	1055	1355	3.00	HOL_181001_002
03/10/2018	PS	MWPB	1230	1530	3.00	HOL_181003_001
09/10/2018	PR	MWPA	1430	1730	3.00	HOL_181009_001
10/10/2018	NR	MWPA	0810	1110	3.00	HOL_181010_002
23/10/2018	PR	MWPA	1230	1530	3.00	HOL_181023_002
24/10/2018	PR	MWPA	1445	1745	3.00	HOL_181024_001
05/11/2018	PS	MWPB	1030	1330	3.00	HOL_181105_002
07/11/2018	PS	MWPB	1015	1315	3.00	HOL_181107_002
27/03/2019	PS	MWPB	0900	1200	3.00	HOL_190327_002
25/03/2019	PS	MWPB	1330	1630	3.00	HOL_190325_001
18/03/2019	PS	MWPB	1330	1630	3.00	HOL_190318_001
21/03/2019	PS	MWPB	1130	1430	3.00	HOL_190321_002
04/04/2019	PS	MWPB	1330	1630	3.00	HOL_190404_002
05/04/2019	PS	MWPB	1500	1800	3.00	HOL_190405_001
08/04/2019	PS	MWPB	1145	1445	3.00	HOL_190408_002
09/04/2019	JD	MWPB	0930	1230	3.00	HOL_190409_002
11/04/2019	JD	MWPB	1600	1900	3.00	HOL_190411_001
15/04/2019	JD	MWPB	0900	1200	3.00	HOL_190415_002
01/05/2019	JD	MWPB	1530	1830	3.00	HOL_190501_002
08/05/2019	JD	MWPB	0930	1230	3.00	HOL_190508_003
19/09/2019	PS	MWPB	1020	1320	3.00	HOL_190919_002
21/09/2019	PS	MWPB	1200	1500	3.00	HOL_190921_002
25/09/2019	PS	MWPB	1530	1830	3.00	HOL_190925_001
28/09/2019	PS	MWPB	0820	1120	3.00	HOL_190928_001
01/10/2019	PS	MWPB	1520	1820	3.00	HOL_191001_001
03/10/2019	PS	MWPD	1400	1700	3.00	HOL_191003_002
09/10/2019	PS	MWPB	1100	1400	3.00	HOL_191009_002
11/10/2019	PS	MWPB	1120	1420	3.00	HOL_191011_002
18/10/2019	PS	MWPB	1200	1500	3.00	HOL_191018_001
28/10/2019	PS	MWPB	1300	1600	3.00	HOL_191028_001

Date	Observer	VP	Start	Finish	Duration	Watch ID*
01/11/2019	PS	MWPB	1040	1340	3.00	HOL_191101_002
08/11/2019	PS	MWPB	1330	1630	3.00	HOL_191108_001

Annex 9.1.5 Weather details for MWP Watches

*Precipitation Codes: Continuous / Intermittent + Light / Heavy + Rain / Snow / Hail / Fog

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Direction	Wind Force	Precipitation	Visibility (km)
HOL_180322_001	0	10	1000	W	2	nil	20
HOL_180322_001	1	9	1000	W	2	nil	20
HOL_180322_001	2	9	1000	W	3	nil	20
HOL_180322_001	3	8	1000	W	3	nil	20
HOL_180321_001	0	9	1000	WSW	4	nil	20
HOL_180321_001	1	10	1000	WSW	4	ILR	20
HOL_180321_001	2	10	1000	WSW	5	ILR	10
HOL_180321_001	3	10	1000	WSW	5	ILR	5
HOL_180328_001	0	10	1000	NW	2	nil	10
HOL_180328_001	1	10	700	NE	2	nil	10
HOL_180328_001	2	10	500	NE	2	CLR	10
HOL_180328_001	3	10	700	NE	2	nil	10
HOL_180402_001	0	7	1000	SE	2	nil	30
HOL_180402_001	1	6	1000	SE	2	nil	30
HOL_180402_001	2	3	1000	SE	3	nil	30
HOL_180402_001	3	3	1000	SE	4	nil	30
HOL_180403_001	0	9	1000	NE	3	nil	20
HOL_180403_001	1	9	1000	NE	3	ILR	20
HOL_180403_001	2	9	1000	NE	3	ILR	20
HOL_180403_001	3	10	500	NE	3	ILR	10
HOL_180406_001	0	10	1000	NE	3	nil	5
HOL_180406_001	1	10	1000	NE	3	nil	5
HOL_180406_001	2	10	1000	NE	4	nil	5
HOL_180406_001	3	10	1000	NE	4	nil	5
HOL_180412_001	0	0	-	SE	4	nil	20
HOL_180412_001	1	0	-	SE	4	nil	20
HOL_180412_001	2	0	-	SE	4	nil	15
HOL_180412_001	3	1	1000	SE	5	nil	15
HOL_180413_002	0	10	500	NE	3	nil	5
HOL_180413_002	1	10	500	NE	3	ILR	5
HOL_180413_002	2	10	500	NE	3	CLR	4
HOL_180413_002	3	10	500	NE	3	ILR	5
HOL_180425_001	0	10	500	nil	0	ILR	3
HOL_180425_001	1	10	500	nil	0	CHR	5
HOL_180425_001	2	5	500	nil	0	nil	20
HOL_180425_001	3	5	500	nil	0	ILR	20
HOL_180428_001	0	8	1000	nil	0	nil	20
HOL_180428_001	1	6	1000	nil	0	nil	20
HOL_180428_001	2	4	1000	nil	0	nil	20
HOL_180428_001	3	3	1000	nil	0	nil	20
HOL_180504_001	0	10	700	SW	2	nil	20
HOL_180504_001	1	10	700	SW	3	nil	20
HOL_180504_001	2	10	700	SW	3	nil	20
HOL_180504_001	3	10	700	SW	3	nil	20
HOL_180508_001	0	4	500	E	2	nil	15

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Direction	Wind Force	Precipitation	Visibility (km)
HOL_180508_001	1	4	500	E	2	nil	15
HOL_180508_001	2	8	500	SE	2	nil	15
HOL_180508_001	3	7	500	SE	2	nil	15
HOL_180918_001	0	10	200	NW	1	nil	10
HOL_180918_001	1	10	200	NW	1	ILR	10
HOL_180918_001	2	10	500	NE	1	ILR	10
HOL_180918_001	3	10	500	NE	2	nil	15
HOL_180919_001	0	10	400	S	5	CHR	5
HOL_180919_001	1	10	400	SE	5	IHR	5
HOL_180919_001	2	10	400	SE	6	IHR	5
HOL_180919_001	3	8	700	SW	6	IHR	20
HOL_180926_002	0	10	500	W	4	nil	5
HOL_180926_002	1	9	1000	W	5	nil	10
HOL_180926_002	2	10	1000	W	4	nil	5
HOL_180926_002	3	10	500	W	4	ILR	3
HOL_180927_002	0	10	500	NW	4	ILR	2
HOL_180927_002	1	9	1000	NW	4	ILR	5
HOL_180927_002	2	10	1000	N	5	nil	5
HOL_180927_002	3	8	1000	N	5	ILR	10
HOL_181001_002	0	10	1000	N	3	nil	10
HOL_181001_002	1	7	1000	N	3	nil	10
HOL_181001_002	2	10	1000	N	3	nil	10
HOL_181001_002	3	10	1000	nil	0	CLR	5
HOL_181003_001	0	10	500	SW	3	ILR	3
HOL_181003_001	1	10	500	SW	3	CLR	2
HOL_181003_001	2	10	500	SW	3	ILR	3
HOL_181003_001	3	10	500	SW	3	CHR	3
HOL_181009_001	0	10	500	nil	0	CLR	5
HOL_181009_001	1	10	500	nil	0	CLR	5
HOL_181009_001	2	10	1000	nil	0	ILR	20
HOL_181009_001	3	10	1000	nil	0	nil	20
HOL_181010_002	0	1	1000	S	3	nil	20
HOL_181010_002	1	1	1000	S	4	nil	20
HOL_181010_002	2	1	1000	S	4	nil	20
HOL_181010_002	3	1	1000	S	4	nil	20
HOL_181023_002	0	10	500	SW	4	ILR	15
HOL_181023_002	1	10	500	SW	4	nil	15
HOL_181023_002	2	10	300	SW	4	ILR	10
HOL_181023_002	3	10	300	SW	4	IHR	10
HOL_181024_001	0	10	1000	WSW	4	nil	20
HOL_181024_001	1	10	1000	W	4	nil	20
HOL_181024_001	2	10	1000	W	5	nil	20
HOL_181024_001	3	10	1000	W	5	ILR	20
HOL_181105_002	0	10	1000	nil	0	CLR	5
HOL_181105_002	1	10	1000	nil	0	CLR	5
HOL_181105_002	2	10	1000	nil	0	ILR	5
HOL_181105_002	3	10	1000	nil	0	nil	5
HOL_181107_002	0	10	1000	S	4	nil	5
HOL_181107_002	1	10	1000	S	5	nil	5

Watch ID	Hour	Cloud 10 ^{ths}	Cloud Base	Wind Direction	Wind Force	Precipitation	Visibility (km)
HOL_181107_002	2	10	1000	S	5	nil	10
HOL_181107_002	3	10	1000	S	5	nil	10
HOL_190327_002	0	10	1000	W	3	nil	5
HOL_190327_002	1	10	1000	W	3	nil	5
HOL_190327_002	2	10	1000	W	4	nil	5
HOL_190327_002	3	10	1000	W	4	nil	5
HOL_190325_001	0	10	1000	N	3	nil	5
HOL_190325_001	1	10	1000	N	3	nil	5
HOL_190325_001	2	10	1000	N	3	nil	5
HOL_190325_001	3	10	1000	N	2	nil	5
HOL_190318_001	0	1	1000	W	2	nil	10
HOL_190318_001	1	1	1000	W	2	nil	10
HOL_190318_001	2	1	1000	W	1	nil	10
HOL_190318_001	3	0	-	nil	0	nil	10
HOL_190321_002	0	8	1000	W	1	nil	5
HOL_190321_002	1	5	1000	W	1	nil	5
HOL_190321_002	2	3	1000	W	1	nil	5
HOL_190321_002	3	7	1000	NE	2	nil	5
HOL_190404_002	0	10	1000	SE	3	ILR	5
HOL_190404_002	1	10	1000	SE	2	ILR	5
HOL_190404_002	2	10	1000	nil	0	nil	10
HOL_190404_002	3	10	1000	SE	2	nil	10
HOL_190405_001	0	2	1000	NE	2	nil	10
HOL_190405_001	1	1	1000	N	1	nil	10
HOL_190405_001	2	1	1000	nil	0	nil	10
HOL_190405_001	3	1	1000	NE	1	nil	10
HOL_190408_002	0	10	1000	E	1	nil	5
HOL_190408_002	1	10	1000	E	1	nil	5
HOL_190408_002	2	10	1000	E	1	nil	5
HOL_190408_002	3	10	1000	E	1	nil	5
HOL_190411_001	0	10	1000	N	1	nil	5
HOL_190411_001	1	10	1000	NW	1	nil	5
HOL_190411_001	2	9	1000	NW	1	nil	5
HOL_190411_001	3	8	1000	NW	1	nil	5
HOL_190415_002	0	7	1000	E	3	nil	5
HOL_190415_002	1	4	1000	SE	4	nil	5
HOL_190415_002	2	5	1000	SE	4	nil	5
HOL_190415_002	3	6	1000	SE	4	nil	5
HOL_190501_002	0	10	1000	NE	1	nil	5
HOL_190501_002	1	9	1000	nil	0	nil	5
HOL_190501_002	2	10	1000	nil	0	nil	5
HOL_190501_002	3	10	1000	NE	1	nil	5
HOL_190508_003	0	10	1000	SE	1	ILR	5
HOL_190508_003	1	10	1000	SE	1	ILR	5
HOL_190508_003	2	10	1000	SE	1	ILR	5
HOL_190508_003	3	10	1000	SE	1	ILR	5
HOL_190919_002	0	10	1000	nil	0	nil	5
HOL_190919_002	1	10	1000	W	1	nil	5
HOL_190919_002	2	10	1000	W	1	nil	5

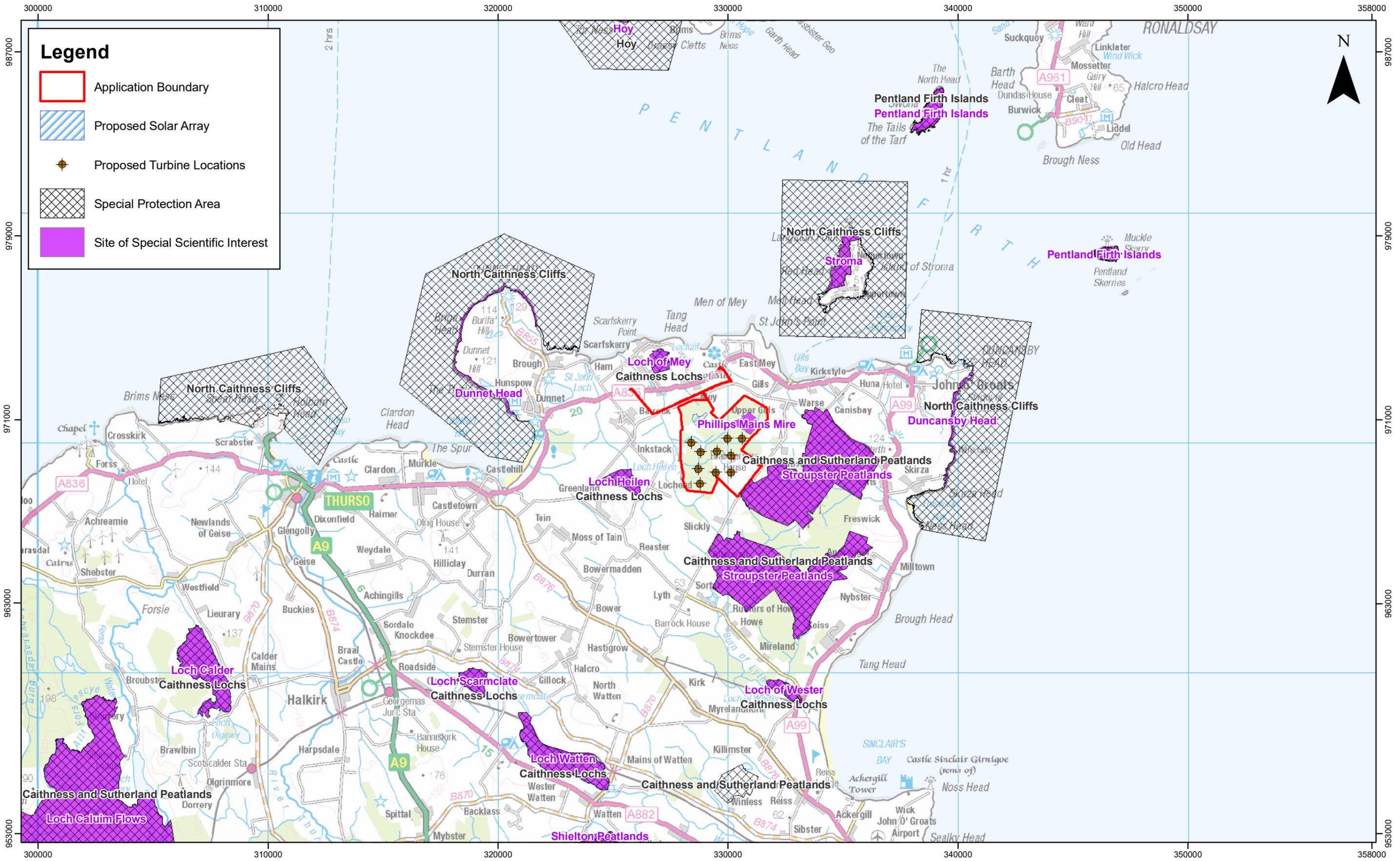
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HOL_190921_002	0	0	-	SW	3	nil	5
HOL_190921_002	1	0	-	SW	4	nil	5
HOL_190921_002	2	0	-	SW	4	nil	5
HOL_190921_002	3	0	-	SW	4	nil	5
HOL_190925_001	0	10	500	E	4	nil	5
HOL_190925_001	1	10	500	E	3	nil	3
HOL_190925_001	2	10	500	E	3	nil	3
HOL_190925_001	3	10	500	E	4	nil	3
HOL_190928_001	0	10	1000	nil	0	nil	4
HOL_190928_001	1	10	1000	nil	0	nil	4
HOL_190928_001	2	10	1000	nil	0	nil	3
HOL_190928_001	3	10	1000	nil	0	nil	4
HOL_191001_001	0	7	1000	NNE	3	nil	5
HOL_191001_001	1	6	1000	NNE	3	nil	5
HOL_191001_001	2	4	1000	NNE	3	ILR	5
HOL_191001_001	3	6	1000	NNE	3	nil	5
HOL_191003_002	0	9	1000	E	2	nil	5
HOL_191003_002	1	8	1000	E	3	nil	5
HOL_191003_002	2	9	1000	E	3	nil	5
HOL_191003_002	3	10	1000	E	3	nil	5
HOL_191009_002	0	10	1000	SE	3	nil	3
HOL_191009_002	1	10	1000	SE	3	nil	3
HOL_191009_002	2	10	1000	SE	3	nil	3
HOL_191009_002	3	10	1000	SE	3	nil	3
HOL_191011_002	0	7	1000	SE	3	nil	3
HOL_191011_002	1	9	1000	SE	2	nil	3
HOL_191011_002	2	9	1000	SE	2	ILR	3
HOL_191011_002	3	10	1000	SE	2	nil	3
HOL_191018_001	0	10	500	SE	1	ILR	3
HOL_191018_001	1	10	1000	SE	1	IHR	3
HOL_191018_001	2	10	1000	SE	2	nil	3
HOL_191018_001	3	10	1000	SE	2	nil	3
HOL_191028_001	0	3	1000	N	1	nil	3
HOL_191028_001	1	3	1000	N	1	nil	3
HOL_191028_001	2	4	1000	N	1	nil	3
HOL_191028_001	3	4	1000	N	1	nil	3
HOL_191101_002	0	10	1000	NE	3	nil	3
HOL_191101_002	1	10	1000	NE	3	ILR	3
HOL_191101_002	2	10	1000	NE	3	nil	3
HOL_191101_002	3	10	1000	NE	3	ILR	3
HOL_191108_001	0	2	1000	nil	0	nil	3
HOL_191108_001	1	2	1000	nil	0	nil	3
HOL_191108_001	2	3	1000	nil	0	nil	3
HOL_191108_001	3	5	1000	nil	0	ILR	3

Annex 9.1.6 Flight Activity Survey Species Lists and BTO Codes

List A		List B		List C	
Species	BTO Code	Species	BTO Code	Species	BTO Code
Diver spp.	RH/BV	Greylag goose	GJ	Cormorant	CA
Common scoter	CX	Barnacle goose	BY	Heron	H.
White-tailed eagle	WE	White-fronted goose	EW(Euro)/NW(Grld)	Kestrel	K.
Golden eagle	EA	Pink-footed goose	PG	Buzzard	BZ
Hen harrier	HH	Brent goose	DB(Dark)/PB(Pale)	Sparrowhawk	SH
Goshawk	GI	Bean goose	BE	Red grouse	RG
Red kite	KT	Golden plover	GP	Grey partridge	P.
Osprey	OP	Dunlin	DN	Lapwing	L.
Merlin	ML	Greenshank	GK	Redshank	RK
Peregrine	PE	Whimbrel	WM	Common sandpiper	CS
Hobby	HY	Curlew	CU	Oystercatcher	OC
Barn owl	BO	Wood sandpiper	OD	Snipe	SN
Short-eared owl	SE	Tern spp.	AE/CN	Woodcock	WK
Black grouse	BK	Arctic Skua	AC	Herring gull	HG
Capercaillie	CP	Great Skua	NX	Cuckoo	CK
Nightjar	NJ			Ring ouzel	RZ
Chough	CF			Raven	RN
Whooper swan	WS				
Rare raptors	HZ/MR/RF/YF				

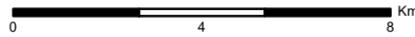
Annex 9.1.7 Other Survey Species Lists and BTO Codes

List A		List B		List C			
Species	BTO Code	Species	BTO Code	Species	BTO Code	Species	BTO Code
Diver spp.	RH/BV	Greylag goose	GJ	Cormorant	CA	Song thrush	ST
Common scoter	CX	Barnacle goose	BY	Heron	H.	Grasshopper warbler	GH
White-tailed eagle	WE	White-fronted goose	EW(Euro)/NW(Grld)	Kestrel	K.	Wood warbler	WO
Golden eagle	EA	Pink-footed goose	PG	Buzzard	BZ	Spotted flycatcher	SF
Hen harrier	HH	Brent goose	DB(Dark)/PB(Pale)	Sparrowhawk	SH	Marsh/Willow tit	MT/WT
Goshawk	GI	Bean goose	BE	Red grouse	RG	Crested tit	CI
Red kite	KT	Golden plover	GP	Grey partridge	P.	Starling	SG
Osprey	OP	Dunlin	DN	Lapwing	L.	House/Tree sparrow	HS/TS
Merlin	ML	Greenshank	GK	Redshank	RK	Linnet	LI
Peregrine	PE	Whimbrel	WM	Common sandpiper	CS	Twite	TW
Hobby	HY	Curlew	CU	Oystercatcher	OC	Lesser redpoll	LR
Barn owl	BO	Wood sandpiper	OD	Snipe	SN	Crossbill/ Scottish c'bill	CR/CY
Short-eared owl	SE	Tern spp.	AE/CN	Woodcock	WK	Bullfinch	BF
Black grouse	BK	Arctic Skua	AC	Herring gull	HG	Hawfinch	HF
Capercaillie	CP	Great Skua	NX	Cuckoo	CK	Yellowhammer	Y.
Nightjar	NJ			Skylark	S.	Reed bunting	RB
Chough	CF			Tree pipit	TP	Corn bunting	CB
Whooper swan	WS			Dunnock	D.	Raven	RN
Rare raptors	HZ/MR/RF/YF			Ring ouzel	RZ	Other wildfowl spp.	MS/MA/GD/T.



Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

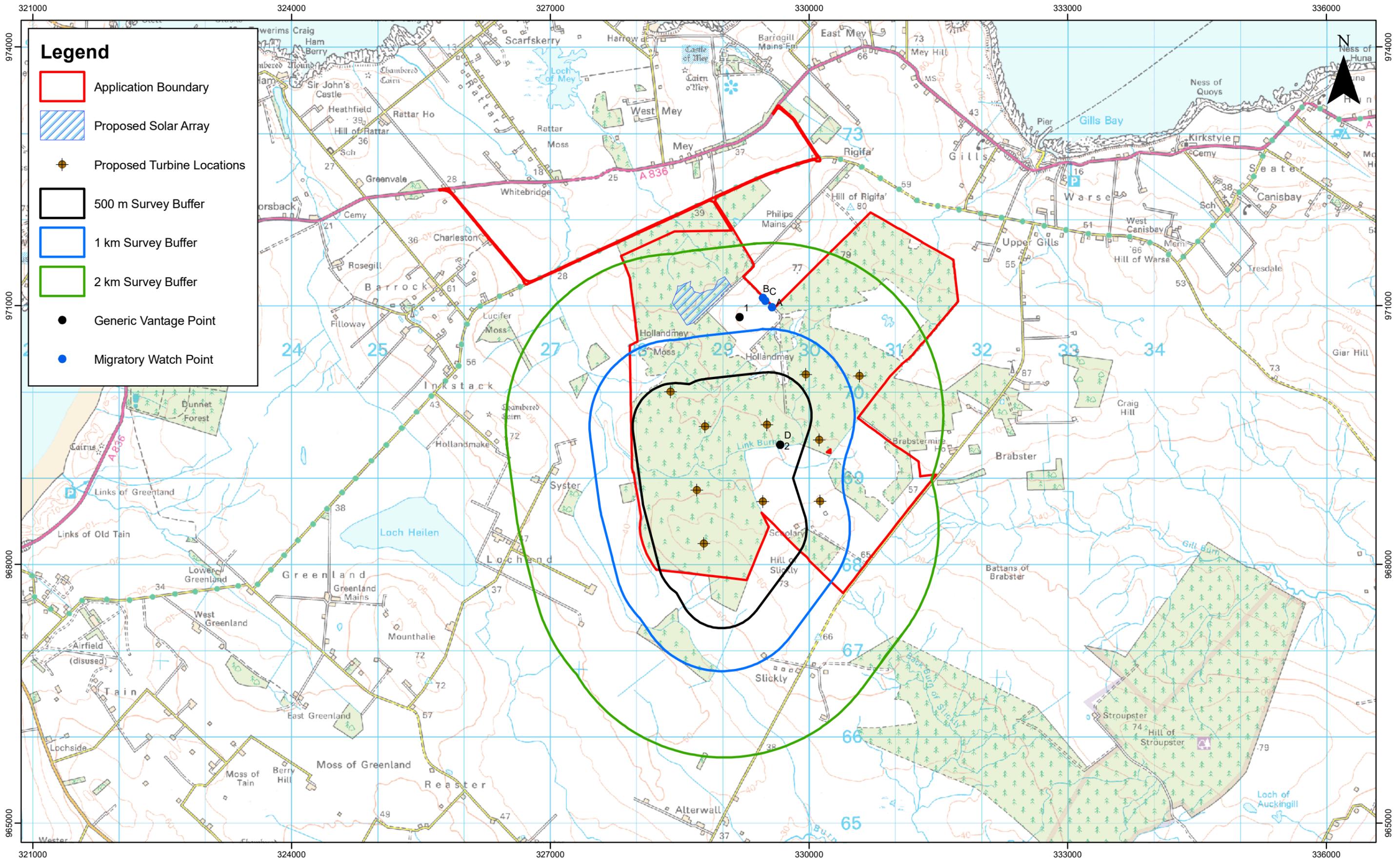
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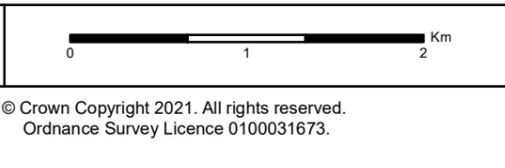
Hollandmey Renewable Energy Development
Figure 9.1.1: Ornithological Designations

Drg No	1	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.1	



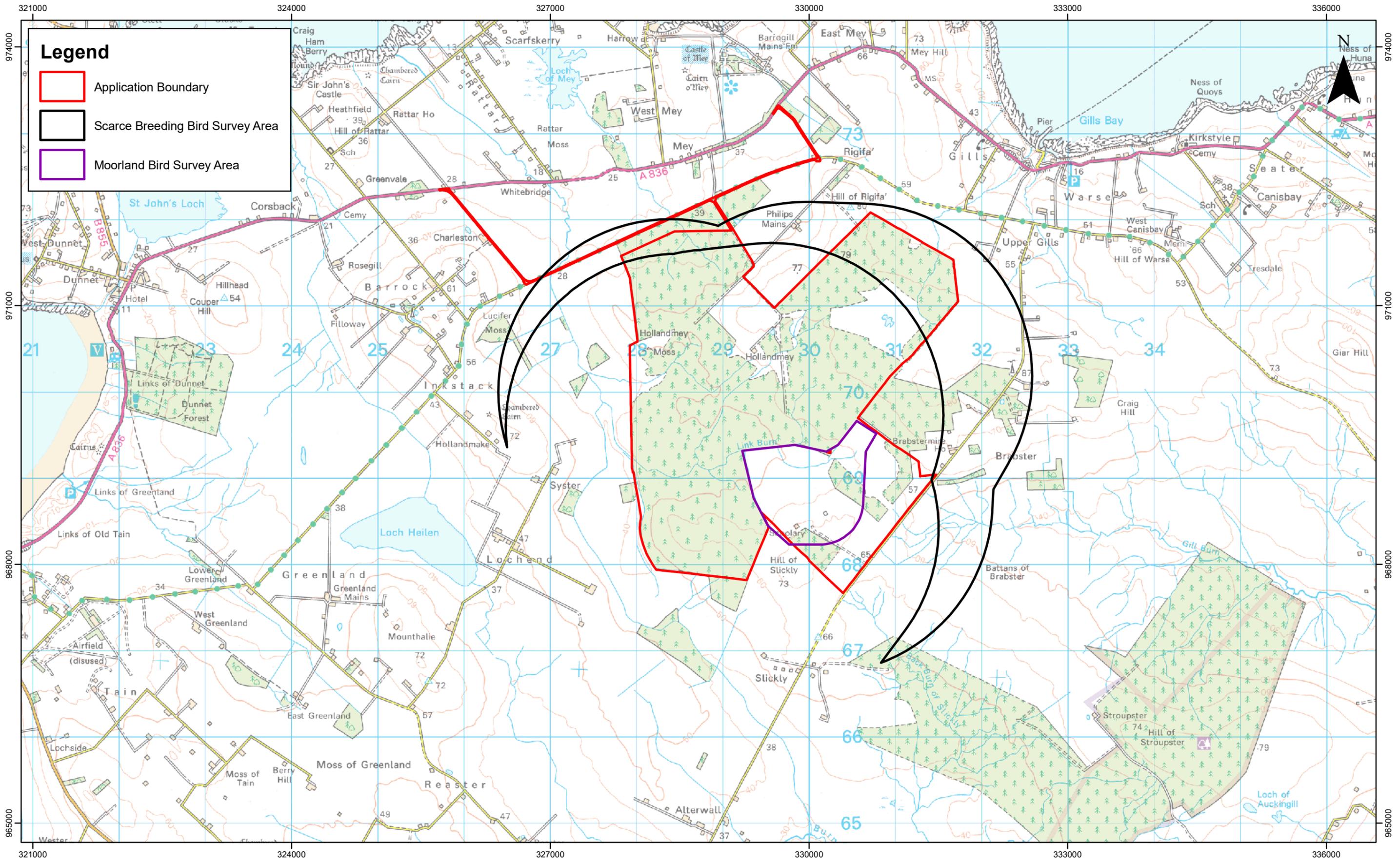
Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

1:40,000
Scale @ A3



Hollandmey Renewable Energy Development
Figure 9.1.2: Survey Locations 2017 to 2020

Drg No	2	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.2	



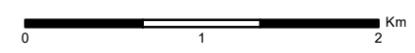
Legend

- Application Boundary
- Scarce Breeding Bird Survey Area
- Moorland Bird Survey Area



Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

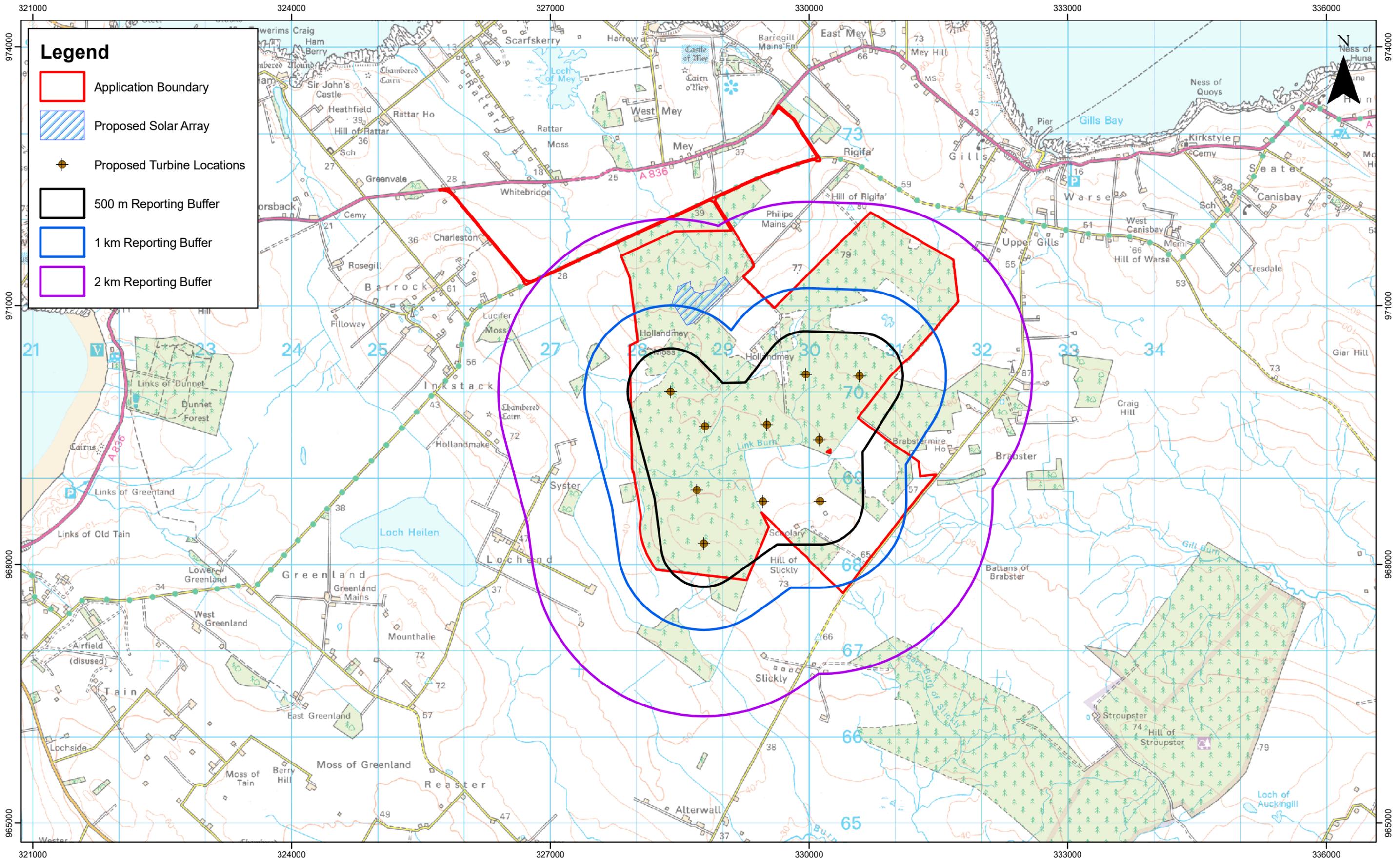
1:40,000
Scale @ A3



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Hollandmey Renewable Energy Development
Figure 9.1.3: Additional Survey Locations
2021

Drg No	3	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.3	



Legend

- Application Boundary
- Proposed Solar Array
- Proposed Turbine Locations
- 500 m Reporting Buffer
- 1 km Reporting Buffer
- 2 km Reporting Buffer



E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.
Rev	Date	By	Comment

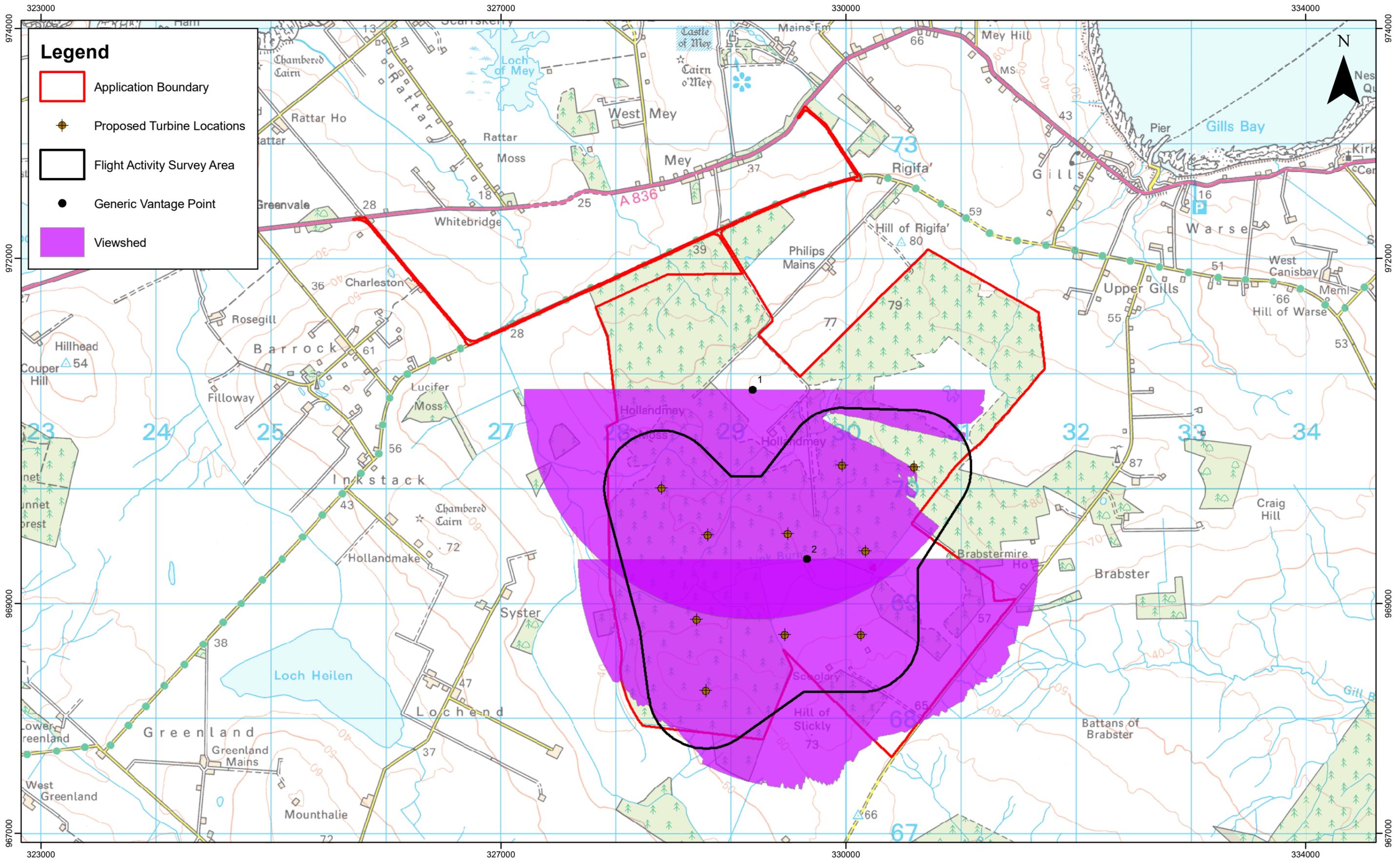
1:40,000
Scale @ A3



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Hollandmey Renewable Energy Development
Figure 9.1.4: Reporting Buffers

Drg No	4	Datum: OSGB36 Projection: TM
Rev	E	
Date	10/11/2021	
Figure	9.1.4	



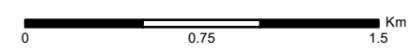
Legend

- Application Boundary
- ◆ Proposed Turbine Locations
- Flight Activity Survey Area
- Generic Vantage Point
- Viewshed



Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

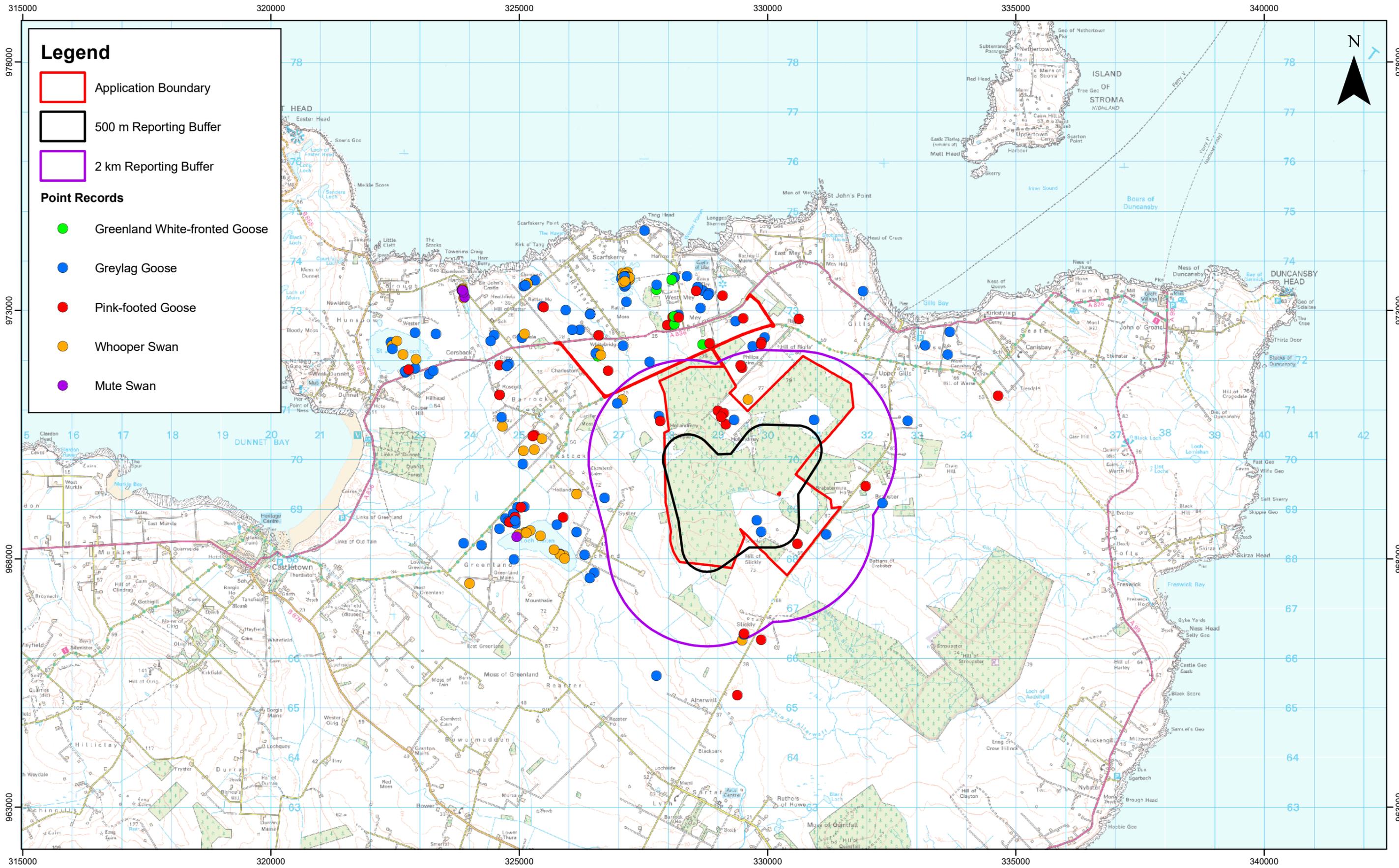
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Scale @ A3



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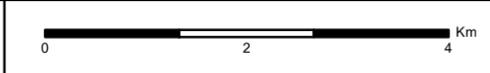
Hollandmey Renewable Energy Development
Figure 9.1.5: Vantage Points and Visibility

Drg No	5	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.5	



E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.
Rev	Date	By	Comment

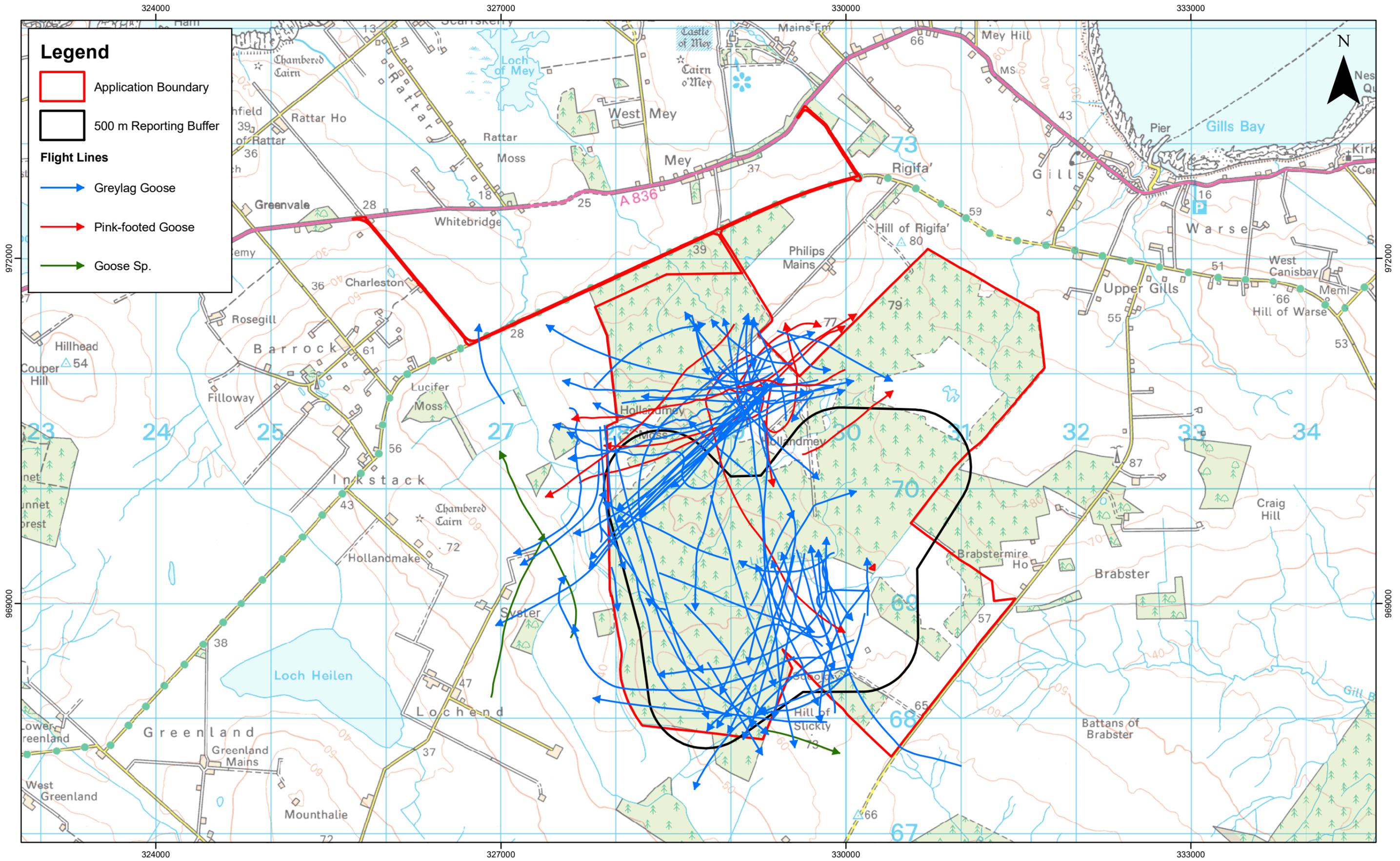
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Scale @ A3



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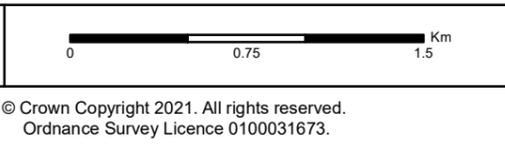
Hollandmey Renewable Energy Development Figure 9.1.6: Swan and Goose Areas

Drg No	6	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.6	



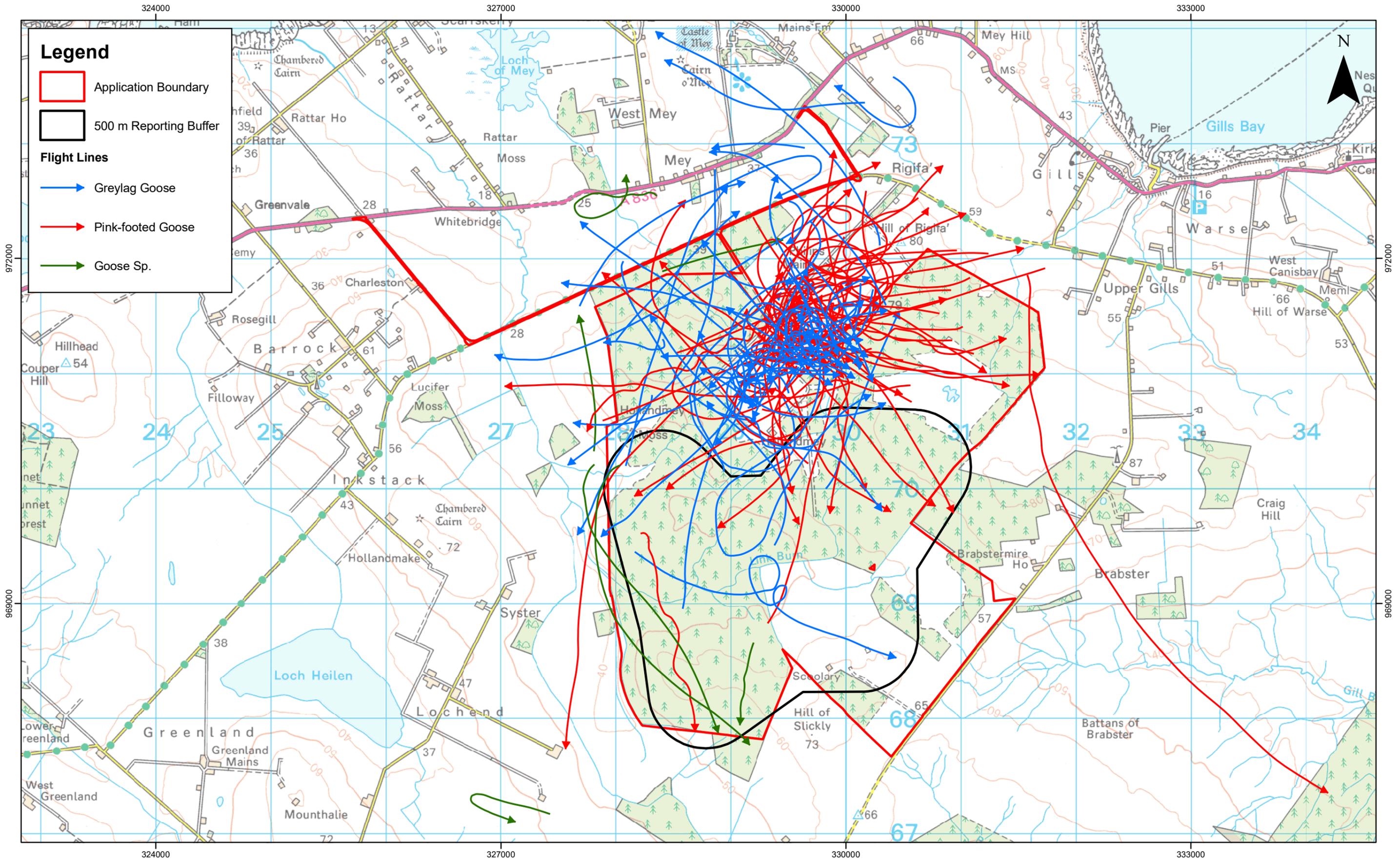
Rev	Date	By	Comment
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D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

1:30,000
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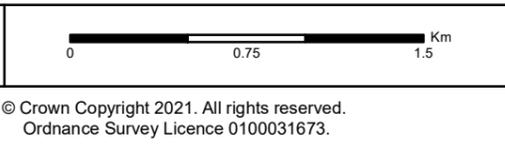
Hollandmey Renewable Energy Development
Figure 9.1.8: Goose Flights Recorded from
Generic Vantage Points

Drg No	8	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.8	



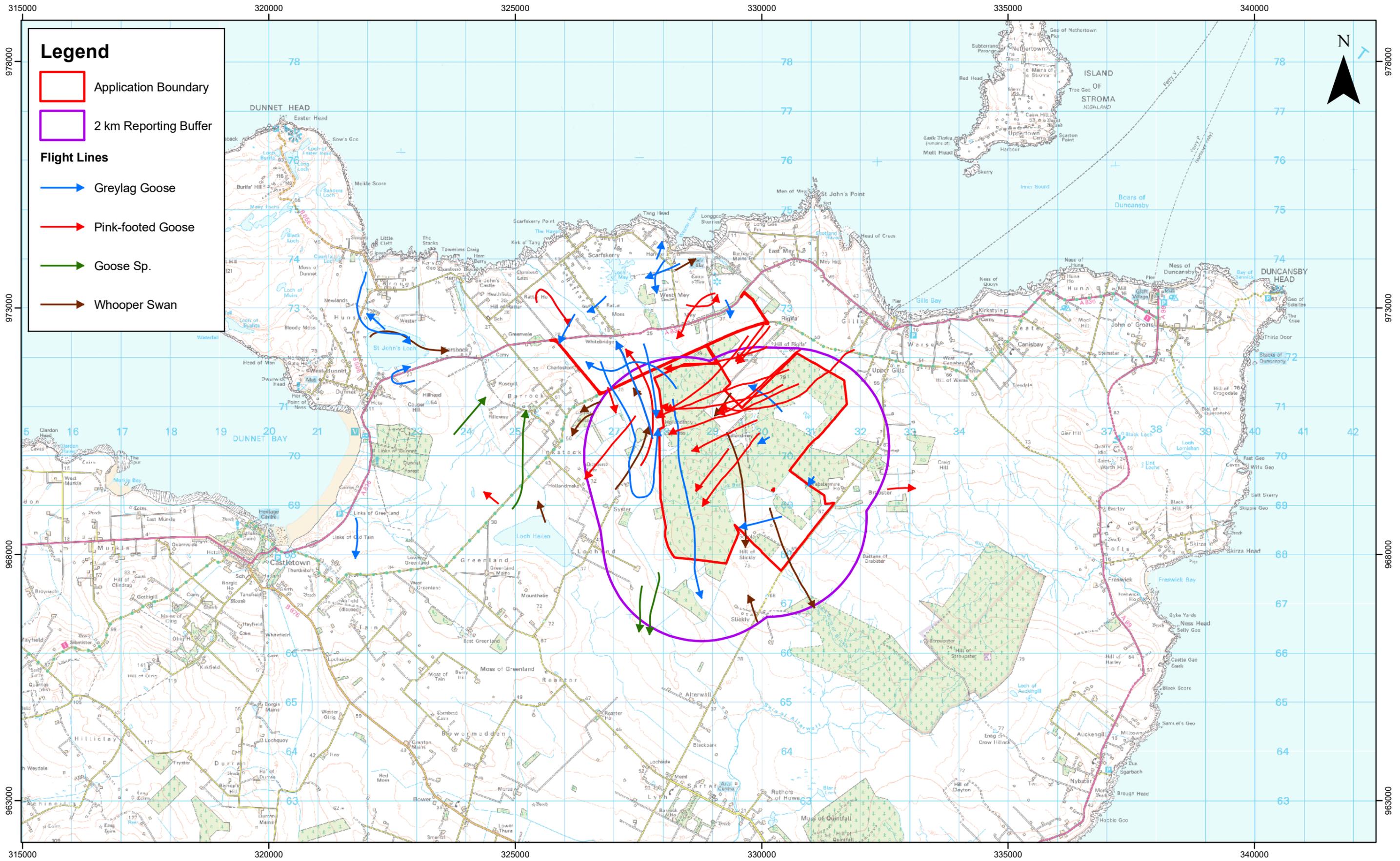
Rev	Date	By	Comment
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D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

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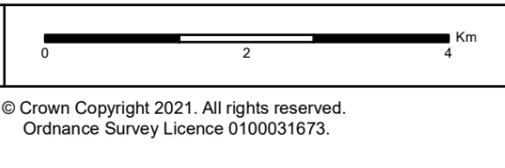
Hollandmey Renewable Energy Development
Figure 9.1.9: Goose Flights Recorded from Migration Watch Points

Drg No	9	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.9	



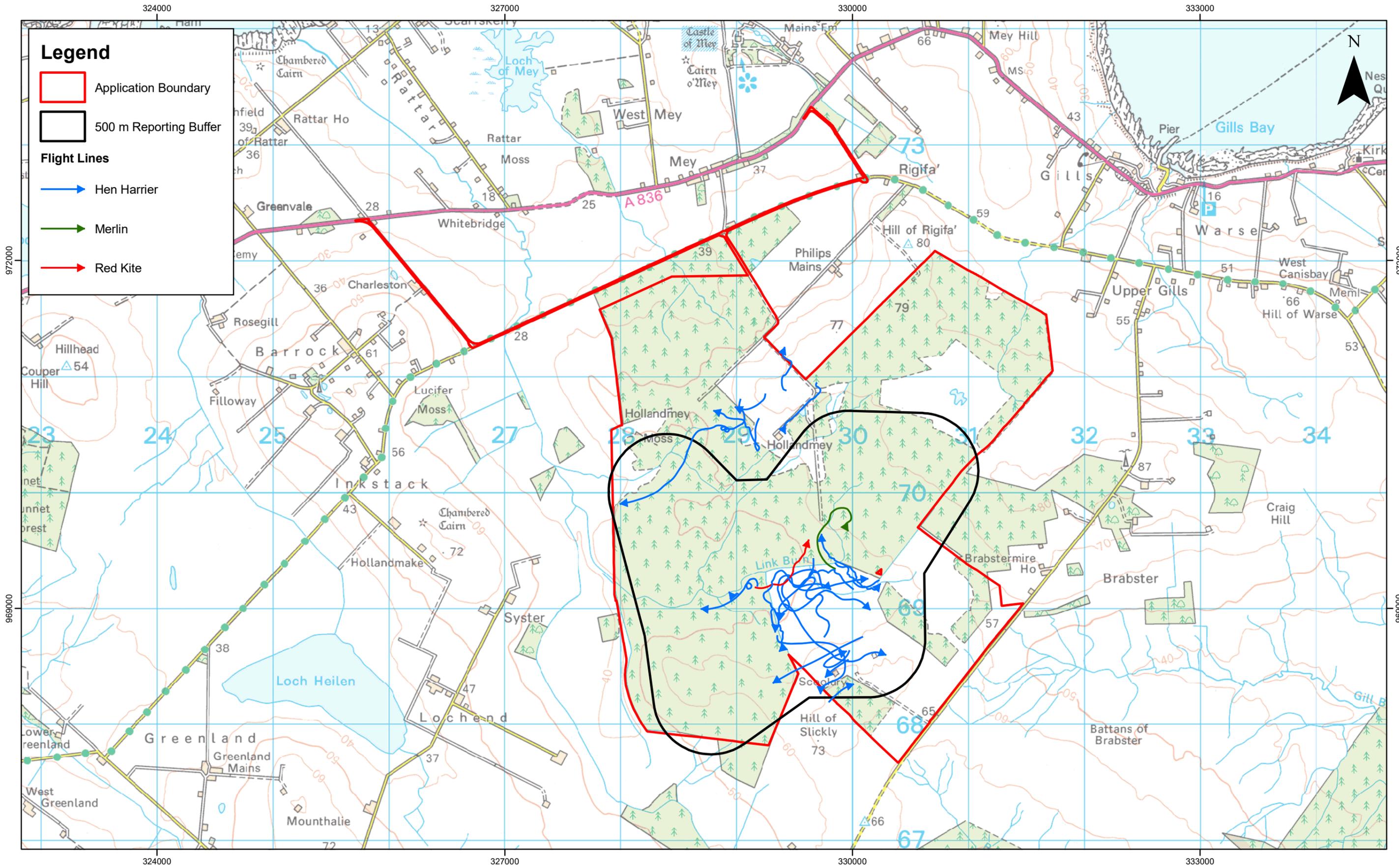
Rev	Date	By	Comment
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D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

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Scale @ A3



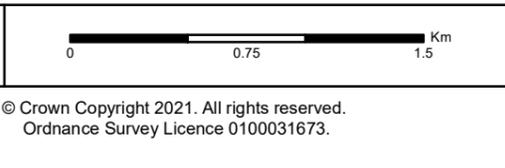
Hollandmey Renewable Energy Development
Figure 9.1.10: Other Swan and Goose Flights

Drg No	10	Datum: OSGB36 Projection: TM
Rev	E	
Date	10/11/2021	
Figure	9.1.10	



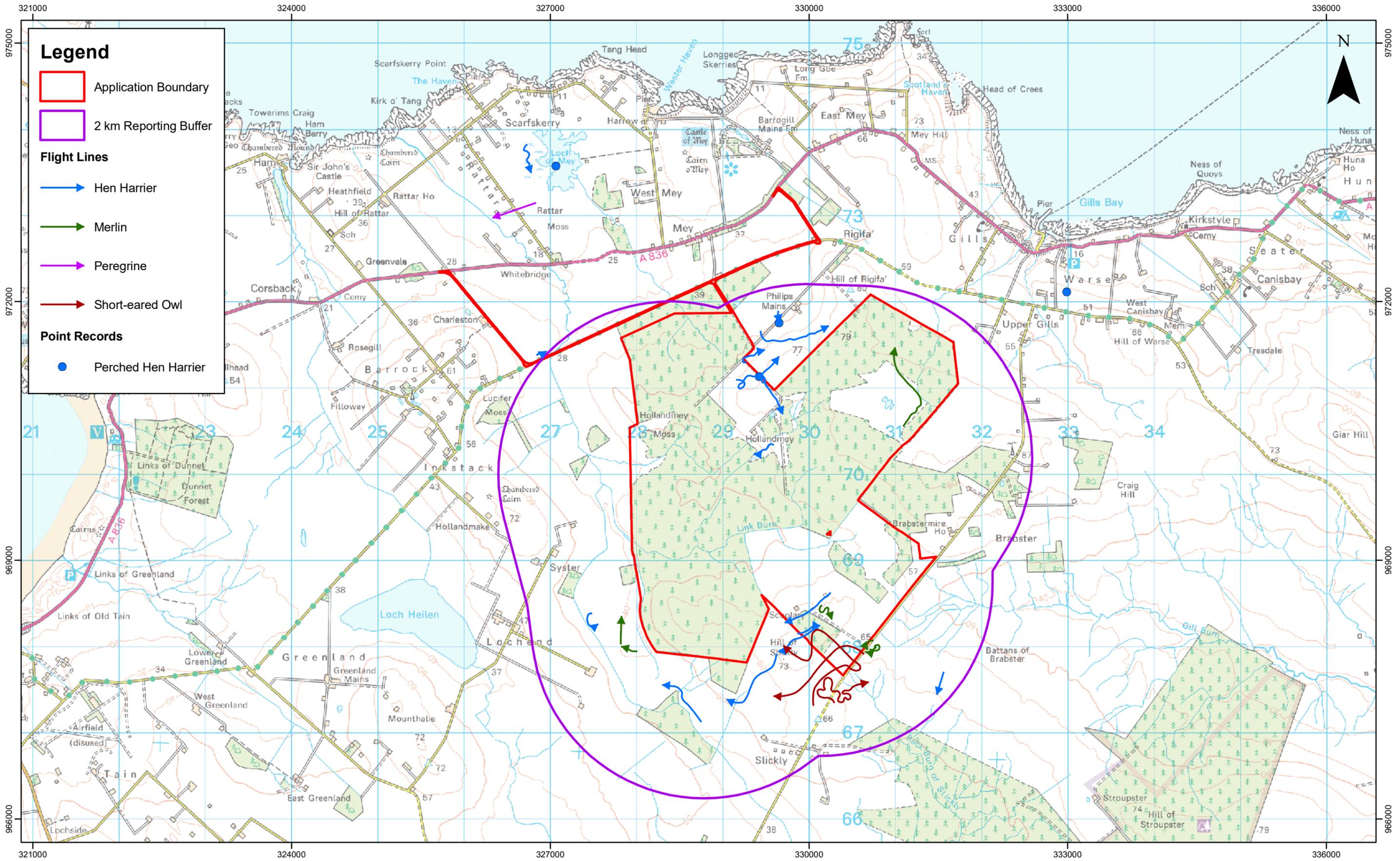
Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
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C	05/10/2021	BU	Third Issue.

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Scale @ A3



Hollandmey Renewable Energy Development
Figure 9.1.11: Raptor Flights Recorded from Generic Vantage Points

Drg No	11	
Rev	E	Datum: OSGB36
Date	10/11/2021	Projection: TM
Figure	9.1.11	



Legend

- Application Boundary
- 2 km Reporting Buffer

Flight Lines

- ➔ Hen Harrier
- ➔ Merlin
- ➔ Peregrine
- ➔ Short-eared Owl

Point Records

- Perched Hen Harrier



Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

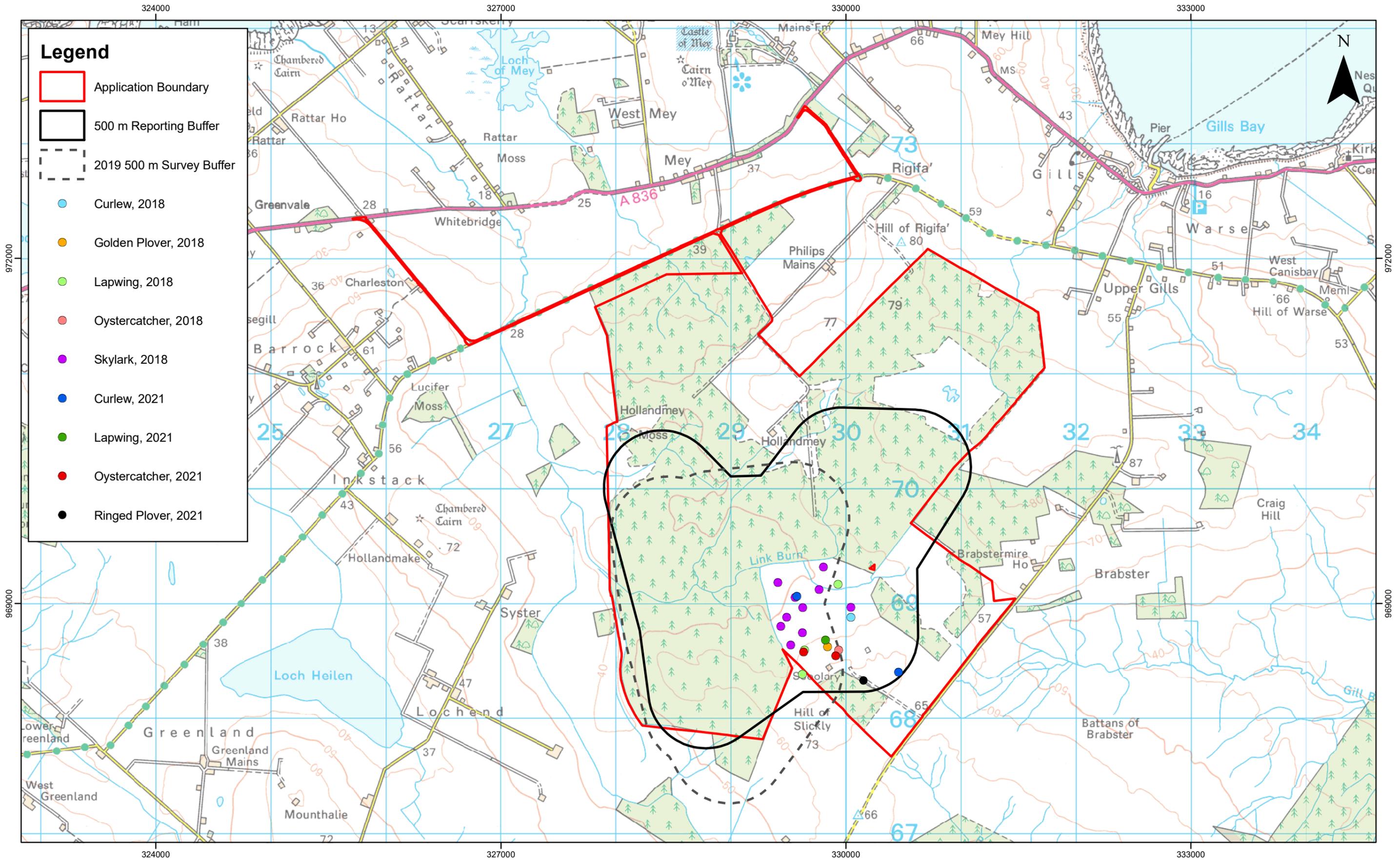
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Scale @ A3



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Hollandmey Renewable Energy Development
Figure 9.1.12: Other Raptor Flights

Drg No	12	Datum:	OSGB36
Rev	E	Projection:	TM
Date	10/11/2021		
Figure	9.1.12		



Legend

- Application Boundary
- 500 m Reporting Buffer
- 2019 500 m Survey Buffer
- Curlew, 2018
- Golden Plover, 2018
- Lapwing, 2018
- Oystercatcher, 2018
- Skylark, 2018
- Curlew, 2021
- Lapwing, 2021
- Oystercatcher, 2021
- Ringed Plover, 2021



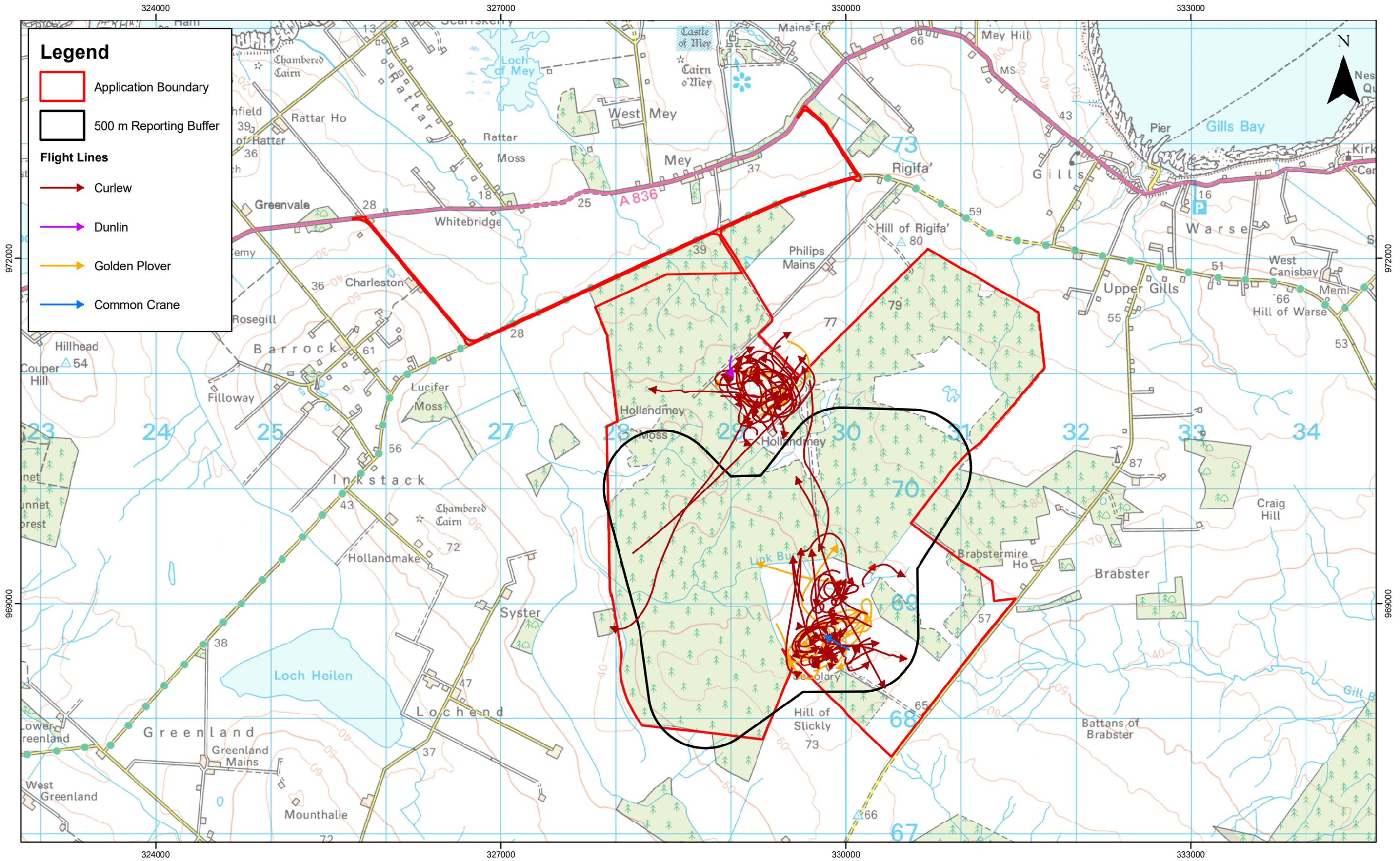
Rev	Date	By	Comment
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C	05/10/2021	BU	Third Issue.

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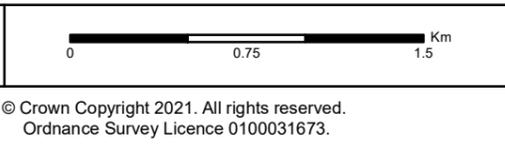
Hollandmey Renewable Energy Development
Figure 9.1.13: Breeding Bird Survey Results

Drg No	13
Rev	E
Date	10/11/2021
Figure	9.1.13
Datum:	OSGB36
Projection:	TM



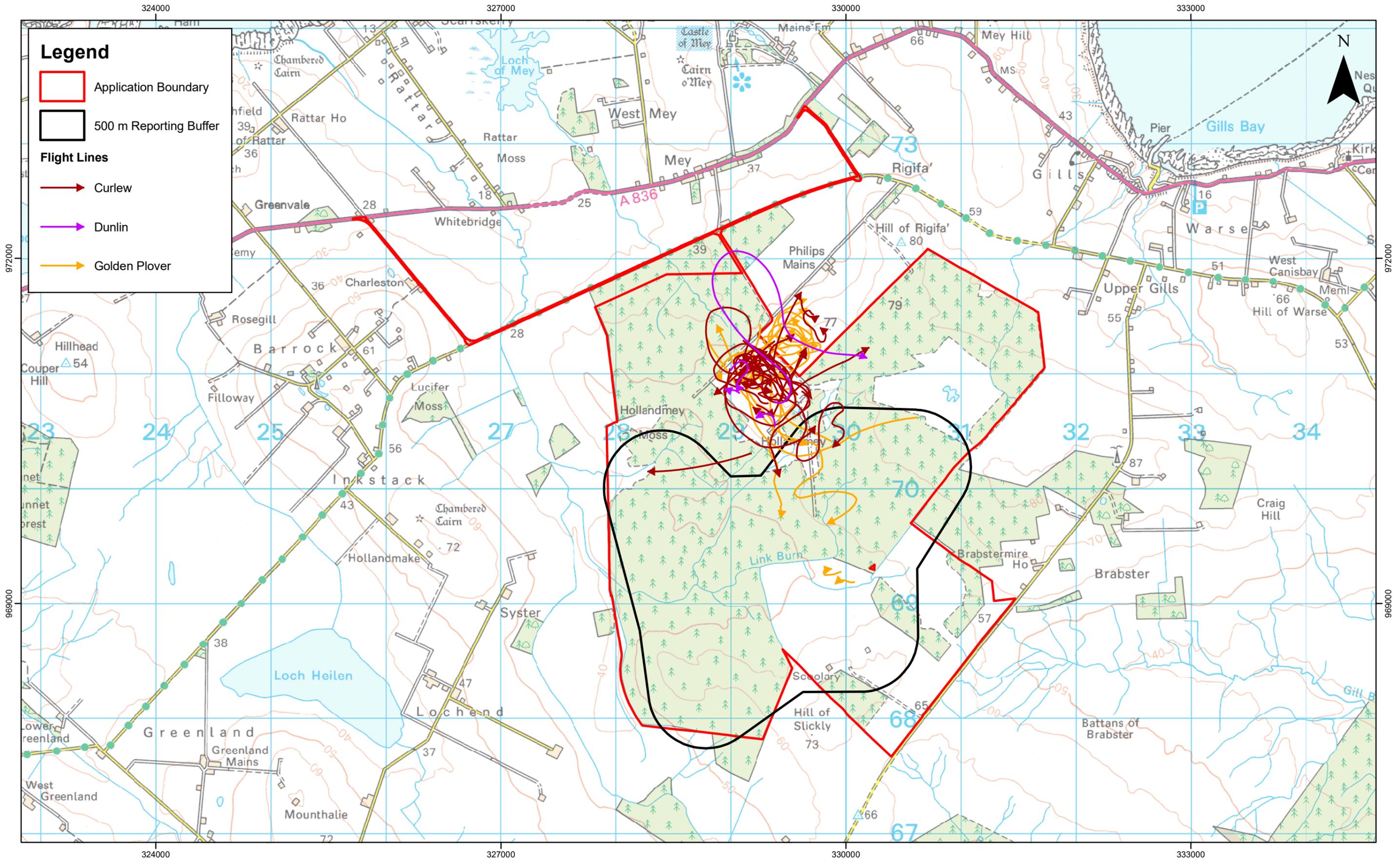
Rev	Date	By	Comment
E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

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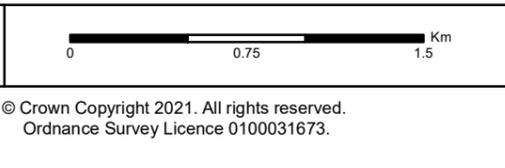
Hollandmey Renewable Energy Development
Figure 9.1.14: Wader and Common Crane
Flights Recorded from Generic Vantage Points

Drg No	14	Datum:	OSGB36
Rev	E	Projection:	TM
Date	10/11/2021		
Figure	9.1.14		



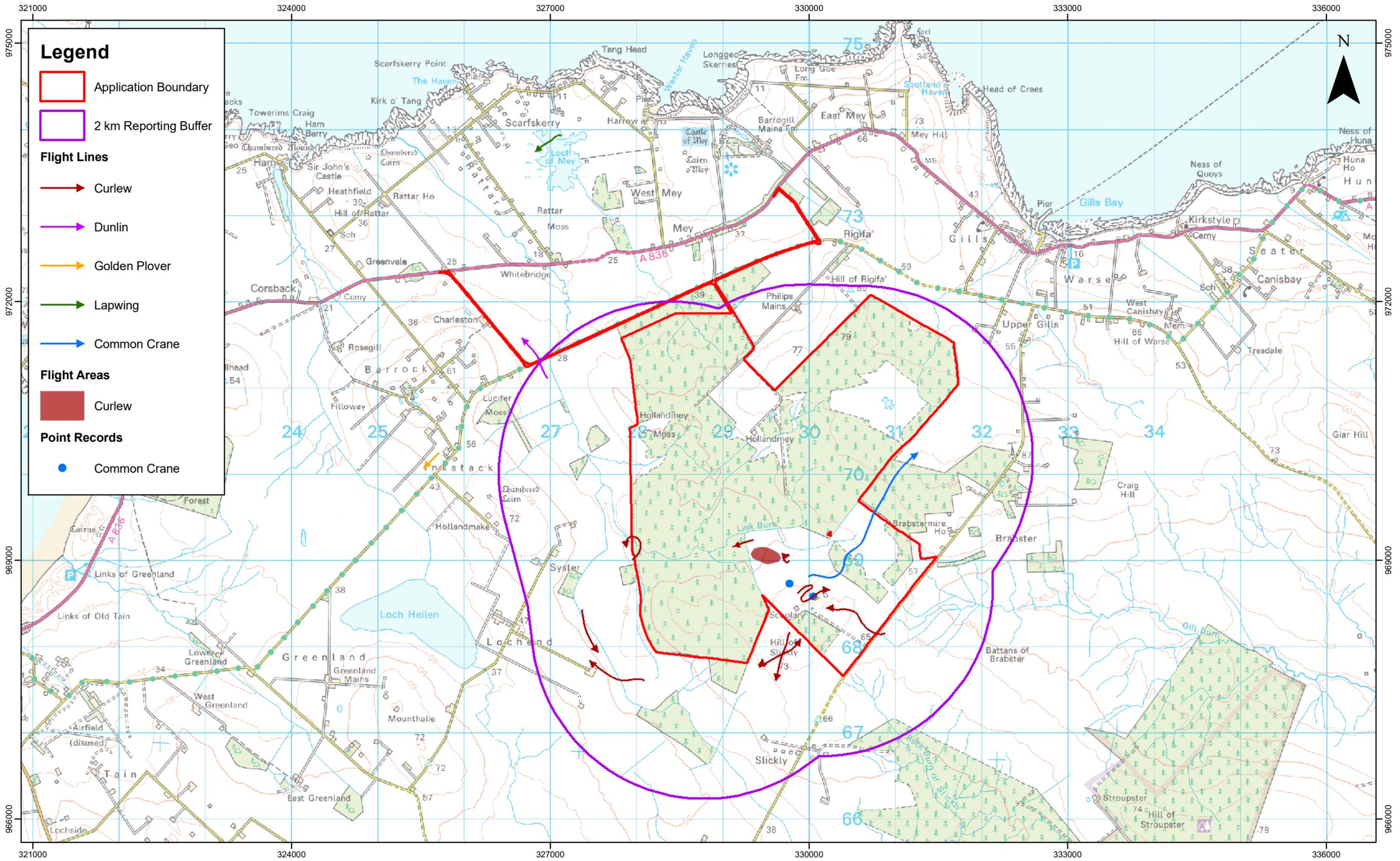
Rev	Date	By	Comment
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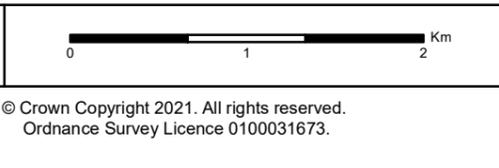
Hollandmey Renewable Energy Development
Figure 9.1.15: Wader Flights Recorded from Migration Watch Points

Drg No	15
Rev	E
Date	10/11/2021
Figure	9.1.15
Datum:	OSGB36
Projection:	TM



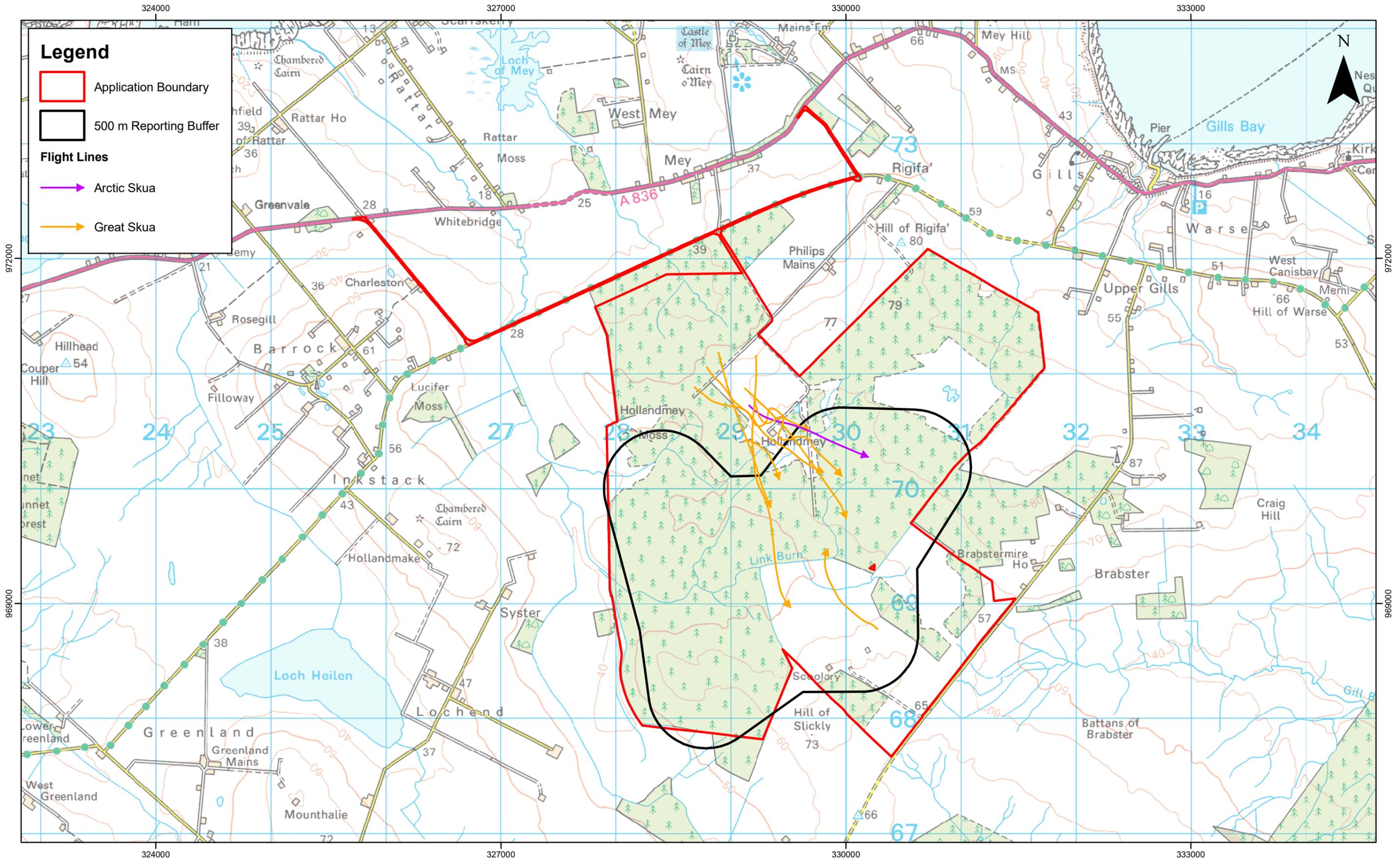
Rev	Date	By	Comment
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D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

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Scale @ A3



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Figure 9.1.16: Other Wader and Common Crane Flights

Drg No	16	Datum:	OSGB36
Rev	E	Projection:	TM
Date	10/11/2021		
Figure	9.1.16		



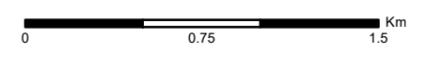
Legend

- Application Boundary
- 500 m Reporting Buffer
- Flight Lines**
- Arctic Skua
- Great Skua



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E	10/11/2021	AA	Fifth Issue.
D	12/10/2021	BU	Fourth Issue.
C	05/10/2021	BU	Third Issue.

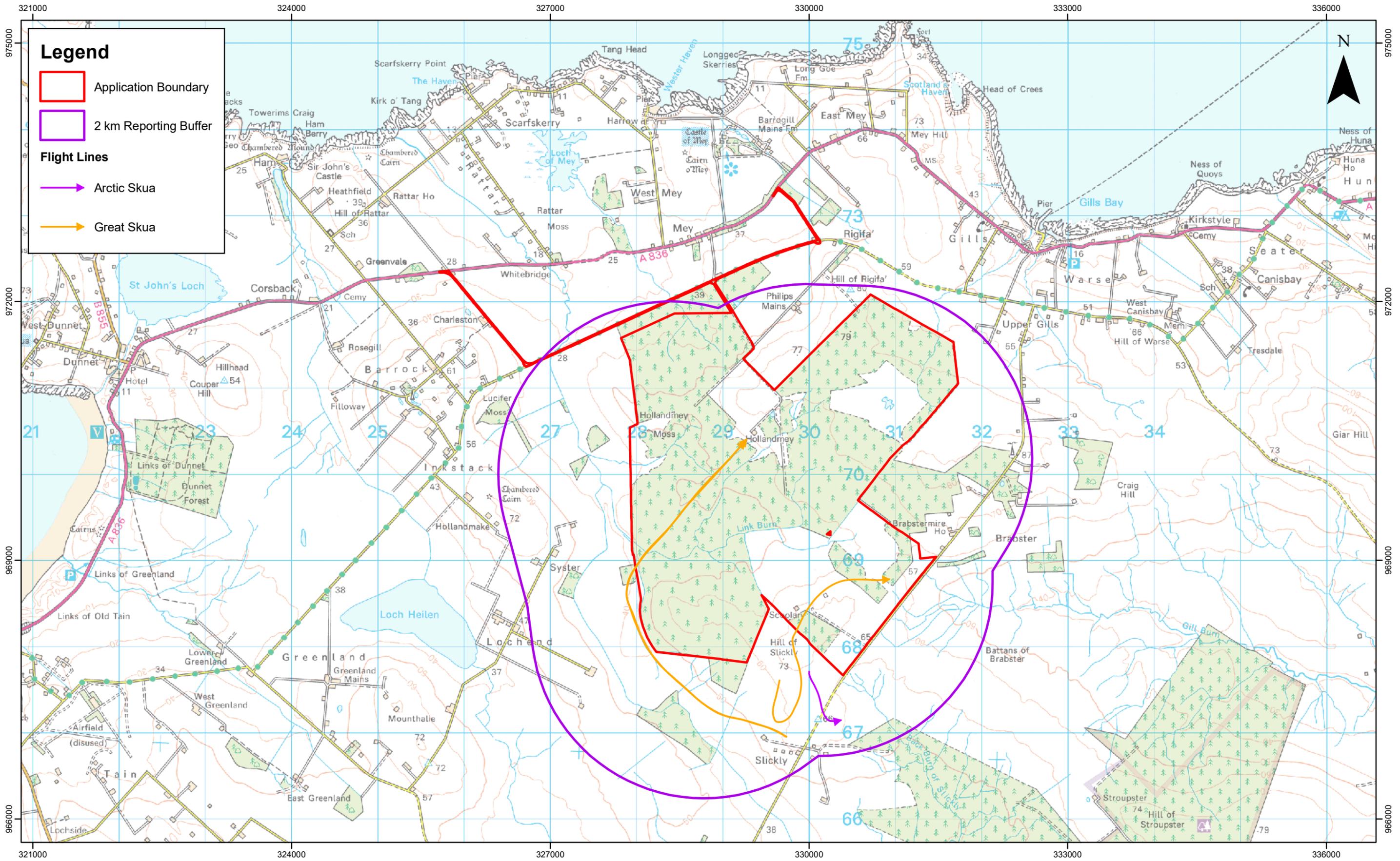
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Figure 9.1.17: Skua Flights Recorded from
Generic Vantage Points

Drg No	17
Rev	E
Date	10/11/2021
Figure	9.1.17
Datum:	OSGB36
Projection:	TM



Legend

- Application Boundary
- 2 km Reporting Buffer

Flight Lines

- Arctic Skua
- Great Skua



Rev	Date	By	Comment
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C	05/10/2021	BU	Third Issue.

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Figure 9.1.18: Other Skua Flights

Drg No	18	Datum:	OSGB36
Rev	E	Projection:	TM
Date	10/11/2021		
Figure	9.1.18		