

2019

Sheirdrim Renewable Energy Development

Appendix 9.1 - Report on Ornithological Surveys

2014 to 2019

n r p NATURAL RESEARCH
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SHEIRDRIM RENEWABLE ENERGY DEVELOPMENT

ORNITHOLOGY REPORT 2014 TO 2019

Introduction

1. This report details the results of ornithological survey work undertaken by Natural Research (Projects) Ltd (NRP) on and around the site of the proposed Sheirdrim Renewable Energy Development (“the proposed Development”) during the period January 2014 to August 2019.
2. Whilst this report details the results from the period January 2014 to August 2019, NRP have been working in the wider area since December 2012. Due to ornithological constraints identified in 2013 the proposed Development was reduced in size requiring reciprocal changes to the survey area and associated buffers and the number of vantage points required to provide adequate coverage. Furthermore, data gathered during the period December 2012 to December 2013 may have been considered too ‘old’ and, as such, the results are not presented here.
3. The objectives of the study were to:
 - Map the distributions of breeding birds, including scarce species listed in Annex 1 of the EU Birds Directive (2009/147/EC) on the Conservation of Wild Birds (the Birds Directive) or Schedule 1 of the Wildlife and Countryside Act 1981 (WCA).
 - Quantify the level of bird flight activity by breeding, wintering and foraging birds of potential conservation importance.
 - Record the presence and abundance of other birds of conservation importance (those listed in Biodiversity Action Plans (BAP), on the Red List of Birds of Conservation Concern (BoCC) (Eaton *et al.*, 2015¹) or the IUCN Red list of Threatened Species (IUCN, 2019²)) throughout the survey period.

Field Survey Methods

4. The baseline surveys detailed here commenced in January 2014 and continued until end of August 2019.

¹ Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. & Gregory, R.D. (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708-746.

² IUCN. (2019). IUCN Red List of Threatened Species (ver. 2019-2). Available at: <http://www.iucnredlist.org>. (Accessed: August 2019).

5. The Study Area was defined with reference to the proposed Development and encompasses a series of buffers of up to 6 km radius; with buffer size dependent on the sensitivity of key species to potential effects associated with the proposed Development (Figure 1). The various survey areas, which make up the Study Area, are defined as follows:

- ‘Site’ refers to the area enclosed by the proposed Development’s red-line boundary;
- ‘breeding bird survey area’, ‘winter walkover survey area’ or ‘core survey area’ refers to the Site plus an additional 500 m wide strip around the site area;
- ‘flight activity survey area’ or ‘FASA’ refers to a polygon around the outermost turbines plus an additional 500 m strip around the polygon;
- ‘black grouse survey area’ refers to the Site plus an additional 1.5 km wide strip;
- ‘barn owl survey area’ refers to the Site plus an additional 1.0 km wide strip; and
- ‘raptor survey area’ refers to the Site plus an additional 2-6 km wide strip depending on the focal species and presence of contiguous suitable habitat outside of the core survey area.

6. Field surveyors were Duncan Cameron (DJC), Kevin Duffy (KJD), Ged Connelly (GC), Iain Mackenzie (IMK), Jonathan Clarke (JAC), Brendan Dunlop (BJD), Neil Thurgate (NT), Aidan McCormack (AM), John Halliday (JH), Bob Stakim (RAS), Simon Pinder (SJP) and Blair Urquhart (BU). All field surveyors are trained ornithologists with extensive experience in surveying birds. Field surveyors received training prior to and during survey work to maintain professional standards.

Flight activity survey

7. Information on bird flight activity was collected during timed watches from strategic Vantage Points (VPs) using the methods described by Band *et al.* (2007³). VPs were selected through a mix of GIS analysis and field trials, with the aim of maximising ground visibility within the Site using the minimum number of points. A total of six VPs were used providing coverage of the proposed turbine locations and associated buffer (the FASA). Viewsheds from each VP are derived using a 20 m vertical cut-off (Figures 2a, 2b and 2c).
8. Observers at VPs positioned themselves to minimise their effects on bird behaviour. A viewing arc not exceeding 180 degrees was scanned. Watches were undertaken during daylight hours by a single observer in a wide range

³ Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M., Janss, G.F.E. and Ferrer, M. (Eds.) *Birds and Wind Farms: Risk assessment and Mitigation*, pp. 259 - 275. Quercus, Madrid.

of weather conditions, mainly in conditions of good ground visibility (> 2km). Weather data can be found in Appendix 2.

9. Between January 2014 and October 2014, a minimum of 66.5 hours of Vantage Point watches were undertaken from VPs 1, 2 and 4, totalling around 204 hours of observation. Between November 2014 and November 2016, a minimum of 151.5 hours of Vantage Point watches were undertaken from VPs 9, 10 and 11, totalling around 466 hours of observation. In 2019, Vantage Point watches were undertaken between April and August from VPs 1, 2, 4, 9 and 11 totalling 183 hours of observation. Over the study period around 853 hours of Vantage Point watches were undertaken (Table 1).

Table 1. Summary of monthly VP observations. Data are hours of observation.														
Year	VP No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Grand Total
2014	VP1	4.65	5.50	7.00	7.83	8.00	8.00	8.00	6.00	7.50	5.00			67.48
	VP2	5.00	6.50	5.00	7.50	8.00	8.00	8.00	7.50	7.50	7.00			70.00
	VP4	5.00	5.50	5.50	7.50	8.00	11.50	4.50	7.00	7.50	4.50			66.50
	VP9											3.00	4.50	7.50
	VP10											5.00	2.25	7.25
	VP11											5.00	4.50	9.50
2015	VP9	5.00	5.50	7.00	7.50	8.00	8.00	7.00	8.50	7.50	5.50	5.00	4.50	79.00
	VP10	5.00	5.50	7.00	7.00	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50	78.50
	VP11	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50	5.00	4.50	79.00
2016	VP9	5.00	5.50	7.00	7.58	8.00	8.00	8.00	7.50	7.50	2.50	3.00		69.58
	VP10	5.00	5.50	7.00	7.50	8.00	7.00	8.00	5.00	7.50	5.50			66.00
	VP11	5.00	5.50	7.00	7.50	8.00	8.00	8.00	7.50	7.50	5.50			69.50
2019	VP1				9.00	9.00	6.00	9.00	6.00					39.00
	VP2				12.00	6.00	6.00	6.00	6.00					36.00
	VP4				9.50	8.50	5.92	6.00	6.00					35.92
	VP9				9.00	7.17	8.00	6.00	6.00					36.17
	VP11				12.00	4.00	8.00	6.00	6.00					36.00
Total		44.65	50.50	59.50	118.91	106.67	108.42	100.50	94.00	67.50	46.50	31.00	24.75	852.90

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

- Focal bird sampling - timed. The viewing arc was scanned constantly until a *Target A Species*⁴ was detected in flight. Once detected, the bird was followed until it ceased flying or was lost to view. The time the bird was initially detected and the time it spent flying (to the nearest second) were recorded. The route followed by the bird was plotted in the field onto an enlarged 1:25,000 scale map, with the direction of flight indicated. 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. Flying elevation was classified as <10 m, 10-30 m, 30-50 m, 50-100 m, 100-150m or >150 m.

In some circumstances, instead of mapping a flight line, a 'flight area' denoting the area in which a bout of flight activity occurred was plotted on the field map. Recording the spatial extent of a flight bout with a flight area was preferable in circumstance where;

- simultaneous flight activity by a number of birds was observed;
- an individual flight bout is observed over a long period of time;
- an individual flight bout is too complicated, i.e. a display flight, or
- any combination of the above.

- Focal bird sampling – untimed. The same scanning procedure as described above was used. However flights of *Target B Species* 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 5-min period, flight activity within the survey area by species of lesser conservation importance (*Secondary Species*) was summarised. Each VP watch was sub-divided into 5-minute periods and at the end of each 5-minute period the total number of individuals of each secondary target species seen flying in the study area was recorded. The height, direction and number of individuals involved in notable bird movements were recorded.

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

Focal Vantage Point (FVP) watches

12. Observers at FVPs positioned themselves to minimise their effects on bird behaviour. A viewing arc not exceeding 180 degrees was scanned (Figure 2d). Watches were undertaken by a single observer in a wide range of weather conditions, mainly in conditions of good ground visibility (> 2km) and when the cloud base was higher than the most elevated parts of the survey area. Weather data can be found in Appendix 2. During each watch the same scanning procedure as the timed focal bird sampling, described above, was used.

⁴ Target species were drawn from those listed in Annex 1 of the Birds Directive and Schedule 1 of the WCA. Other species considered important in a regional or local context may also be included. These are listed in Appendix 1.

13. During the months of October to April three FVPs (NW1-NW3) were selected to gather species-specific data on Greenland white-fronted goose (*Anser albifrons flavirostris*) movements between roosting sites and feeding grounds. Watches were undertaken at dawn and dusk. In total, over 308 hours of observation was undertaken from FVPs NW1-NW3 (Table 2).

14. During the breeding seasons of 2014, 2015 and 2016 five FVPs (D1-D5) were selected to gather species-specific data on red-throated diver (*Gavia stellata*) movements. In total, over 85 hours of observation was undertaken from FVPs D1-D5 (Table 2).

15. During 2016 one FVP (EA1) was selected to gather species-specific data on golden eagle (*Aquila chrysaetos*) movements. In total, over 55 hours of observation was undertaken from FVP EA1 (Table 2).

Table 2. Summary of monthly FVP observations. Data are hours of observation.														
Year	FVP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Grand Total
2014	D1						3.50	7.25						10.75
	NW1	1.00	5.42	5.50							4.50	7.00	7.08	30.50
	NW3	6.50	3.50	1.17	1.00									12.17
2015	D1					2.00	3.00	4.00	2.00					11.00
	D2						5.00	4.50						9.50
	D3						5.00	6.00	2.00					13.00
	NW1	8.00	14.00	4.00							14.00	15.25	2.25	57.50
	NW2											2.00	8.50	10.50
2016	D1						8.00		12.00					20.00
	D2					3.00	5.00							8.00
	D4								3.00	2.00				5.00
	D5								8.00					8.00
	EA1		6.00	6.00	6.00	6.00	6.00	6.00	6.00	9.00	4.50			55.50
	NW1	4.00	8.00	6.00	2.50		2.00					8.00	12.58	43.08
2017	NW2	8.25	6.00	6.25								8.00		28.50
	NW1	12.00	6.00	10.50	2.00						10.00	8.73	5.17	54.40
2018	NW2	12.00	6.25	4.00	2.00						1.00			25.25
	NW1	21.00	11.25	2.00	5.83									40.08
2018	NW2	2.08	2.83	2.00										6.92
Total		74.83	69.25	47.42	19.33	11.00	37.50	27.75	33.00	11.00	34.00	48.98	35.58	449.65

Scarce breeding birds

16. Priority was given to detecting the species considered most likely to occur: red-throated diver, black-throated diver (*Gavia arctica*), golden eagle, hen harrier (*Circus cynaeus*), peregrine (*Falco peregrinus*), merlin (*F. columbarius*) and barn owl (*Tyto alba*).

17. Surveys for golden eagle focused on areas suitable for nesting and foraging within the 6 km buffer of the proposed Development. Red-throated diver, black-throated diver, hen harrier, peregrine and merlin focused on areas or sites suitable for nesting and foraging within the 2 km buffer of the proposed Development; for barn owl, searches were within the 1 km survey buffer (Figure 1). Surveyors conducted 173 separate searches or watches during the survey period, totalling over 462 hours, to search for scarce breeding species (Table 3). These visits complemented search effort accrued during the course of VP watches. Methods used for individual species are summarised below;

- Diver species. All potential breeding sites within 2 km of the site were checked for suitability and if suitable, further checks for occupancy were made at least twice per calendar month in May-July. The methods employed were based on those described in Gilbert *et al.* (1998⁵). Wherever possible lochs were scanned from a distance to search for incubating birds or other evidence of breeding. Care was taken to record possible re-lay attempts by failed pairs.
- Golden eagle. Survey methods based on Hardey *et al.* (2013⁶) were followed.
- Hen harrier. Survey methods based on Hardey *et al.* (2013⁷) were followed. Emphasis was given to searching habitats considered potentially suitable for nesting, in this case limited to areas of heath/bog with stands > 0.4m tall and areas of re-stock plantation
- Peregrine. Survey methods based on Hardey *et al.* (2013⁸) were followed. Potential and known nest sites were searched for in spring to look for the evidence of occupancy (presence of birds, faeces, fresh prey remains).
- Merlin. Survey methods based on Hardey *et al.* (2013⁹) were followed. Within suitable habitats, old crow nests (which could be re-used by merlin), fence-posts, hummocks, bushes and trees were checked for signs of occupation (e.g. plucked prey, moulted feathers, pellets and faeces). Emphasis was given to heath bog habitats with stands of heather >0.4m tall and edges of closed canopy forestry plantations.
- Barn Owl. Survey methods based on Hardey *et al.* (2013¹⁰) were followed. Systematic searches for potential nest and roost sites were undertaken in summer. Emphasis was placed on searching for birds, nests, pellets, feathers and faecal splash in potentially suitable buildings within 1 km of the proposed Development.

⁵ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird monitoring methods. RSPB Sandy, Bedfordshire.

⁶ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors, a field guide to survey and monitoring. The Stationery Office, Edinburgh.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

Table 3. Details of Scarce Breeding Bird surveys.

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Dir	Wind Force	Precip*	Visibility (km)
2014	17/01/2014	JH	1130	1.50	8	500	E	3	nil	5
	20/01/2014	JH	1000	2.00	5	500	SW	3	nil	10
	24/02/2014	JH	1000	3.50	8	500	SE	4	nil	10
	27/02/2014	JH	1430	2.00	8	600	W	4	IHR	10
	12/03/2014	JH	1030	1.00	2	-	W	3	nil	10
	23/03/2014	JH	0930	2.50	2	700	NW	3	IHH	10
	26/03/2014	JH	1230	2.50	1	-	SE	3	nil	10
	31/03/2014	JH	1000	2.50	2	-	E	4	nil	5
	04/04/2014	JH	1500	2.00	10	300	SE	3	nil	10
	07/04/2014	JH	1000	1.00	10	400	SE	3	nil	10
	10/04/2014	JH	1100	1.00	9	600	SW	3	nil	10
	15/04/2014	JH	1045	2.00	2	1000	SE	4	nil	10
	17/04/2014	JH	1345	3.25	3	1000	NW	6	nil	10
	18/04/2014	JH	0820	1.17	0	-	E	1	nil	10
	24/04/2014	JH	1200	2.00	1	-	SE	4	nil	10
	24/04/2014	JH	1000	2.00	6	400	SE	5	nil	10
	30/04/2014	JH	1330	1.00	2	1000	W	3	nil	10
	09/05/2014	JH	1000	3.50	9	400	SW	3	ILR	10
	09/05/2014	JH	1430	0.50	9	500	SW	4	nil	10
	09/05/2014	JH	1700	1.00	9	500	SW	4	nil	10
	13/05/2014	JH	1000	4.00	2	1000	NW	3	nil	10
	14/05/2014	JH	0945	1.00	10	1000	SW	2	nil	10
	20/05/2014	JH	1545	0.50	8	1000	E	5	nil	10
	21/05/2014	JH	1430	3.50	6	1000	SW	4	nil	10
	27/05/2014	JH	0830	2.50	1	1000	E	3	nil	10
	04/06/2014	JH	1315	1.50	10	1000	NW	3	nil	10
	09/06/2014	JH	0930	3.00	5	500	SE	4	nil	10
	11/06/2014	JH	1300	1.00	2	1000	SW	4	nil	10
	12/06/2014	JH	0715	2.00	1	-	SW	3	nil	10
	15/06/2014	JH	1230	0.50	9	800	NW	3	nil	10
	15/06/2014	JH	1630	1.00	9	1000	NW	3	nil	10
	16/06/2014	JH	1130	1.50	0	-	N	3	nil	10
	17/06/2014	JH	1000	6.50	0	-	NW	3	nil	10
	18/06/2014	JH	1530	1.00	1	-	NW	4	nil	10
	19/06/2014	JH	1200	2.50	1	-	NW	4	nil	10
	20/06/2014	JH	1330	4.00	5	1000	NW	5	nil	10
	23/06/2014	JH	1400	4.00	9	500	NW	3	nil	10
	25/06/2014	JH	0530	2.00	10	200	E	3	CLR	0.5
	02/07/2014	JH	0545	0.50	10	1000	S	3	nil	10
	02/07/2014	JH	1315	0.50	10	1000	S	4	nil	10
	05/07/2014	JH	1000	1.00	6	600	SW	3	nil	10
	07/07/2014	JH	1500	0.75	6	800	SW	3	nil	10
	09/07/2014	JH	1600	1.00	1	-	SW	3	nil	10
	11/07/2014	JH	1200	3.50	9	700	SW	3	nil	10
	18/07/2014	KJD	0845	0.62	6	800	SE	6	nil	20
	18/07/2014	KJD	1230	0.67	9	600	SE	7	nil	10
	28/07/2014	JH	1200	5.50	3	1000	W	3	nil	10
	30/07/2014	JH	1345	1.50	10	400	W	3	ILR	10

Table 3. Details of Scarce Breeding Bird surveys.

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Dir	Wind Force	Precip*	Visibility (km)
	04/08/2014	JH	1400	1.00	2	1000	W	4	nil	10
	05/08/2014	JH	1200	2.00	9	900	SE	4	nil	10
2015	05/02/2015	RAS	1145	1.00	5	400	NW	2	nil	5
	07/04/2015	KJD	1300	0.75	10	700	W	4	nil	10
	20/04/2015	RAS	1700	1.00	4	900	SE	3	nil	5
	21/04/2015	RAS	1330	1.00	5	800	NW	3	nil	5
	23/04/2015	RAS	1300	2.00	3	600	W	3	nil	5
	24/04/2015	RAS	0800	4.00	10	200	W	2	nil	4
	12/05/2015	RAS	0945	5.75	8	600	SW	6	ILR	5
	13/05/2015	RAS	1245	2.25	7	900	W	3	nil	5
	14/05/2015	RAS	1245	2.00	7	900	SE	5	nil	5
	15/05/2015	RAS	0700	5.00	10	800	S	5	nil	5
	21/05/2015	KJD	1345	1.00	10	600	SW	4	nil	5
	29/05/2015	JH	0800	1.00	3	400	W	3	nil	5
	09/06/2015	RAS	1200	1.50	5	900	WNW	3	nil	5
	23/06/2015	RAS	1300	2.50	5	900	NW	3	nil	5
	24/06/2015	RAS	1200	0.50	10	800	S	2	nil	5
	26/06/2015	JH	1700	1.00	10	700	NW	3	nil	10
	26/06/2015	RAS	1100	1.00	10	200	SW	3	CHR	1
	29/06/2015	GC	1145	1.00	10	400	SSW	2	ILR	2
	07/07/2015	RAS	0545	0.75	9	300	SSW	2	nil	4
	07/07/2015	RAS	1430	0.50	9	400	SW	3	nil	4
	29/07/2015	RAS	1130	2.00	5	900	NW	4	nil	5
	30/07/2015	GC	0930	1.50	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)
	06/08/2015	RAS	0630	0.50	10	200	W	2	IHF	2
	12/08/2015	RAS	1500	0.50	10	800	S	3	nil	5
2016	15/02/2016	GC	1320	3.00	6	700	NE	1	nil	5
	15/03/2016	RAS	1115	2.50	7	800	SE	5	nil	5
	08/04/2016	GC	0945	5.00	10	700	S	3	IHR	5
	25/04/2016	JH	0515	0.50	5	800	NW	3	nil	10
	25/04/2016	JH	1200	0.75	5	1000	NW	7	nil	10
	13/05/2016	GC	0800	0.75	8	800	ENE	3	nil	5
	27/05/2016	BU	0700	2.00	10	600	E	3	nil	5
	30/05/2016	BU	0930	2.50	3	1000	SE	1	nil	20
	30/05/2016	BU	1400	0.33	4	1000	S	1	nil	20
	30/05/2016	BU	1520	1.50	4	1000	S	1	nil	20
	02/06/2016	GC	1100	1.00	1	1000	NE	2	nil	5
	20/06/2016	GC	1200	1.00	9	500	WSW	3	ILR	4
	21/06/2016	GC	0700	1.00	10	700	SSE	1	nil	5
	22/06/2016	DJC	1015	0.58	10	700	SW	4	nil	6
	22/06/2016	DJC	1350	3.00	10	1000	SW	3	nil	6
	13/07/2016	GC	0830	2.17	9	600	SW	3	IHR	3
	22/07/2016	GC	1230	1.00	10	600	W	2	nil	5
2018	02/04/2018	DJC	1305	5.00	10	600	NE	6	CLR	4
	14/04/2018	BJD	1430	0.50	10	700	E	5	nil	3
	14/04/2018	BJD	1505	3.67	10	700	E	5	nil	3
	14/04/2018	NT	1430	4.25	10	1000	E	5	nil	3
	15/04/2018	BJD	1215	6.17	3	2000	N	2	nil	3

Table 3. Details of Scarce Breeding Bird surveys.

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Dir	Wind Force	Precip*	Visibility (km)
	15/04/2018	BJD	0930	2.67	8	2000	N	2	nil	3
	15/04/2018	NT	0930	8.92	10	2000	N	2	nil	3
	16/04/2018	BJD	0930	9.17	10	1000	E	4	nil	3
	16/04/2018	NT	0930	9.17	10	1500	E	4	nil	5
	25/04/2018	DJC	0950	5.83	8	900	SW	4	ILR	6
	08/05/2018	BJD	1645	3.50	2	1500	SW	3	nil	5
	09/05/2018	BJD	0515	6.25	10	1000	SE	6	ILR	3
	09/05/2018	DJC	0525	6.23	10	200	SSW	4	ILF	3
	10/05/2018	BJD	0715	12.50	4	2000	W	4	nil	5
	11/05/2018	BJD	0755	8.83	10	1500	SW	4	ILR	3
	29/05/2018	DJC	0925	4.58	1	1000	SE	5	nil	6
	29/05/2018	DJC	1445	2.33	1	1000	SE	5	nil	6
	01/06/2018	DJC	0720	3.17	5	1000	SE	3	nil	3
	04/06/2018	BJD	0815	11.58	10	1500	N	1	ILR	3
	05/06/2018	BJD	0605	2.50	10	1500	N	3	nil	3
	05/06/2018	BJD	0836	9.98	10	1500	NE	3	nil	3
	08/06/2018	BJD	1030	8.00	0	-	NE	1	nil	5
	09/06/2018	BJD	0830	7.50	6	2000	E	3	nil	3
	10/07/2018	BU	0900	5.50	8	1000	NE	1	nil	20
	11/07/2018	BU	0945	2.75	10	400	NNW	1	CHR	2
	11/07/2018	BU	1300	3.00	10	400	NNW	2	CHR	1
	07/08/2018	DJC	0920	7.42	9	900	SW	4	nil	6
	15/08/2018	DJC	0840	7.75	10	300	SW	3	IHR	3
	21/08/2018	DJC	0840	3.92	10	400	SW	3	nil	6
	29/08/2018	DJC	1500	4.00	5	1000	W	5	nil	6
	30/08/2018	DJC	0830	8.50	6	800	SW	2	IHR	4
	31/08/2018	BU	0930	6.00	3	1000	S	3	nil	20
	31/08/2018	DJC	0820	3.67	2	1000	S	3	nil	6
2019	23/04/2019	SJP	1740	1.33	2	500	NE	4	nil	10
	24/04/2019	SJP	0730	0.67	4	500	NE	4	nil	10
	24/04/2019	SJP	1110	0.75	10	500	NE	4	nil	10
	25/04/2019	SJP	0930	0.00	2	500	E	3	nil	10
	25/04/2019	SJP	1415	2.75	10	500	E	3	ILR	10
	26/04/2019	SJP	0620	0.67	10	200	SE	2	nil	1
	26/04/2019	SJP	1100	3.50	10	500	SE	5	nil	10
	28/04/2019	SJP	0840	0.83	3	1000	SW	1	nil	10
	28/04/2019	SJP	1235	0.92	5	1000	SW	1	nil	10
	28/04/2019	SJP	1630	1.08	10	1000	W	2	ILR	10
	29/04/2019	SJP	0800	3.67	10	1000	E	1	ILR	10
	30/04/2019	SJP	0930	8.25	10	700	SE	2	ILR	6
	13/05/2019	SJP	0800	8.50	4	1000	S	3	nil	10
	14/05/2019	SJP	1125	4.83	1	1000	SE	2	nil	10
	29/05/2019	BU	1300	1.25	10	800	S	3	ILR	10
	30/05/2019	BU	1110	3.00	10	400	SE	3	CHR	2
	03/06/2019	DJC	0955	8.50	9	600	SW	6	IHR	3
	04/06/2019	DJC	0820	8.00	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)

Table 3. Details of Scarce Breeding Bird surveys.

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Dir	Wind Force	Precip*	Visibility (km)
	07/06/2019	BU	1245	0.83	5	1000	S	3	nil	20
	11/06/2019	SJP	0800	1.00	10	1000	nil	0	nil	10
	11/06/2019	SJP	1000	2.50	10	1000	nil	0	nil	10
	11/06/2019	SJP	1550	1.33	10	1000	NNW	1	nil	10
	12/06/2019	SJP	1100	2.00	4	1000	NNE	3	nil	10
	12/06/2019	SJP	1600	1.00	9	1000	NE	5	ILR	10
	13/06/2019	SJP	1200	4.25	9	1000	N	2	nil	10
	19/06/2019	DJC	1305	1.42	9	900	SW	3	nil	6
	20/06/2019	BU	1415	1.75	8	800	W	4	ILR	15
	20/06/2019	DJC	1450	2.33	8	900	WSW	5	nil	6
	20/06/2019	DJC	0910	1.50	10	400	WSW	5	IHR	2
	04/07/2019	DJC	0740	0.83	10	800	SW	3	nil	6
	04/07/2019	DJC	1555	1.00	10	800	W	5	nil	6
	04/07/2019	DJC	1130	1.00	10	800	WSW	4	nil	6
	12/07/2019	JH	0645	2.00	10	100	SW	2	CHF	0.1
	13/07/2019	JH	1330	3.00	7	800	NW	5	nil	10
	14/07/2019	JH	0600	1.25	0	-	N	1	nil	10
	14/07/2019	JH	1015	0.75	1	-	NW	2	nil	10
	14/07/2019	JH	1430	1.00	1	-	NW	3	nil	10
	06/08/2019	JH	0950	1.00	8	500	S	3	ILR	10
	06/08/2019	JH	0550	1.00	10	300	SE	3	nil	8
	06/08/2019	JH	1415	1.00	10	400	S	2	CLR	8
	07/08/2019	JH	0900	2.50	7	300	W	4	ILR	8
	07/08/2019	JH	1450	1.00	8	600	W	5	nil	10
	08/08/2019	JH	1530	1.00	3	1000	NW	3	nil	10
	08/08/2019	JH	1630	1.00	3	1000	NW	3	nil	10
	08/08/2019	JH	1130	1.00	7	900	NW	3	nil	10
	08/08/2019	JH	0600	2.00	9	300	W	3	nil	5
Total				462.58						
*Precipitation codes: <u>C</u> ontinuous/ <u>I</u> ntermittent + <u>L</u> ight/ <u>H</u> heavy + <u>R</u> ain/ <u>S</u> now/ <u>H</u> ail/ <u>E</u> og										

Moorland breeding birds

18. Moorland breeding bird territories were surveyed in 2014, 2015 and 2016, within the 500 m survey boundary (Figure 1). The Brown & Shepherd (1993¹¹) method for upland waders was modified to also provide reliable estimates for some breeding moorland passerines by undertaking some surveys during the first few hours of daylight. All bird species listed in Appendix 3 were recorded. Fieldwork was not undertaken in conditions considered likely to affect bird detection, for example strong winds (greater than Beaufort Scale Force 6), persistent precipitation, poor visibility (less than 300 m), or in unusually hot or cold temperatures (Table 4).

¹¹ Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding waders. Bird Study 40: 3 pp 189 -195.

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Direction	Wind Force	Precip*	Visibility (km)
2014	08/04/2014	JH	1030	1.75	6	600	W	5	ILR	10
	08/04/2014	JH	1500	1.00	6	600	W	5	nil	10
	14/04/2014	JH	1000	1.25	9	600	NW	5	ILR	10
	15/04/2014	JH	0800	2.50	1	600	E	4	nil	10
	15/04/2014	JH	1245	1.00	3	1000	SE	4	nil	10
	16/04/2014	JH	0630	3.50	5	1000	SE	5	nil	10
	18/04/2014	JH	0930	1.00	0	-	E	1	nil	10
	22/04/2014	JH	0830	1.00	6	400	E	6	nil	10
	28/04/2014	JH	1000	2.00	7	800	E	4	nil	10
	28/04/2014	JH	0745	2.00	9	600	E	4	nil	10
	29/04/2014	JH	0930	3.00	4	800	SE	3	nil	10
	29/04/2014	JH	0700	2.00	10	600	SE	3	nil	10
	30/04/2014	JH	0700	3.00	10	400	E	4	nil	5
	09/05/2014	JH	1330	1.00	9	400	SW	3	ILR	10
	13/05/2014	JH	0720	0.67	9	1000	NW	1	nil	10
	19/05/2014	JH	1300	4.00	9	1000	NW	2	IHR	10
	20/05/2014	JH	1615	1.50	2	1000	E	5	nil	10
	20/05/2014	JH	1100	3.00	10	1000	E	5	nil	10
	21/05/2014	JH	1200	2.50	5	1000	SW	4	nil	10
	27/05/2014	JH	1100	1.00	3	1000	E	3	nil	10
2015	04/06/2014	JH	0715	0.75	10	600	W	2	nil	10
	16/06/2014	JH	0930	2.00	0	-	N	3	nil	10
	19/06/2014	JH	1100	1.00	1	-	NW	4	nil	10
	21/04/2015	RAS	0830	3.00	5	800	NW	3	nil	5
	22/04/2015	RAS	1045	4.00	1	1000	SW	3	nil	5
	23/04/2015	RAS	0700	1.50	10	0	W	2	CHF	0.1
	24/04/2015	GC	1150	1.00	8	400	NW	2	nil	4
	24/04/2015	GC	0845	1.08	10	200	NW	1	CHF	1
	27/04/2015	GC	1030	1.00	9	600	SSE	4	nil	4
	30/04/2015	GC	1100	2.50	2	700	NW	2	nil	5
	13/05/2015	RAS	0745	2.00	8	900	W	3	nil	5
	13/05/2015	RAS	1145	1.00	8	900	W	3	nil	5
	14/05/2015	RAS	0945	3.00	8	900	SE	5	nil	5
	16/05/2015	RAS	0945	3.00	5	600	W	5	ILR	3
	25/05/2015	GC	1415	1.00	5	700	NW	4	nil	5
	25/05/2015	GC	1000	1.25	10	300	W	4	IHF	2
2016	10/06/2015	RAS	1000	3.50	4	1500	NW	4	nil	5
	24/06/2015	JH	0930	0.67	10	800	SW	2	nil	10
	27/06/2015	JH	1100	3.00	10	800	SE	3	ILR	10
	08/07/2015	RAS	1030	3.00	7	900	NW	4	nil	5
	26/04/2016	JH	0945	3.00	5	900	NW	5	nil	10
	27/04/2016	JH	0545	3.00	1	-	NW	2	nil	10
2016	27/04/2016	JH	1100	0.50	5	1000	NW	4	nil	10
	19/05/2016	GC	1130	2.50	10	400	S	5	CLR	2
	20/05/2016	GC	0930	5.50	6	800	W	4	ILR	5
	30/05/2016	GC	0745	6.00	3	1000	NE	2	nil	5

Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Direction	Wind Force	Precip*	Visibility (km)
	09/06/2016	GC	1200	3.00	8	600	ENE	3	nil	5
	22/06/2016	GC	1350	3.00	8	700	WSW	2	nil	5
Grand Total				104.42						
*Precipitation codes: <u>C</u> ontinuous/ <u>I</u> ntermittent + <u>L</u> ight/ <u>H</u> heavy + <u>R</u> ain/ <u>S</u> now/ <u>H</u> ail/ <u>F</u> og										

19. The survey aimed to cover the ground systematically with a constant search effort. All suitable ground within the 500 m survey boundary was approached closely, typically to within 100 m. Water bodies and isolated trees were examined carefully. Ditches and streams were followed. Surveyors paused at regular intervals to scan and listen for calling and singing birds.
20. Careful attention was given to recording behaviour indicative of breeding and care was taken to avoid counting the same individual more than once. Where necessary, surveyors retraced their steps in order to check the continued presence of previously recorded birds.
21. The location and activity of birds were mapped onto enlarged 1:25,000 scale OS maps using standard BTO codes (Marchant, 1983¹²). The position of each bird was mapped at the point it was first detected. The flight lines of birds seen flying over were recorded.

Winter walked transects

22. Walk-over surveys were undertaken between October and March 2014-2018. These were designed to complement surveys of breeding birds undertaken during the spring and summer (see above), and occurred within the 500 m buffer of the Site (Figure 1).
23. Walk routes meandered to closely examine as much ground as practical, in particular features of potential ornithological importance such as woodland edges, rocky outcrops, mires and streams. Where practicable, observers used a different route on each visit to maximise the eventual spatial coverage of the proposed Development. Observers frequently paused to scan for birds.
24. Fifty-nine walked transects, totalling 80 hours, were undertaken. A range of meteorological conditions were sampled, although wind speeds above Beaufort F6 were avoided to improve aural detection of species (Table 5).
25. The walked transects were effectively mobile VP watches. The procedure employed was as follows:

¹² Marchant, J.H. (1983). *BTO Common Birds Census Instructions*. British Trust for Ornithology, Thetford.

- For *Target Species* the time each individual was first detected was recorded along with details of age, sex and behaviour. These details were cross-referenced to a 1:25,000 scale map where the location and flight route (if applicable) were plotted.
- For all other species, the number of individuals was recorded and locations they were first detected were plotted on the map.

Year	Date	Obs	Start	Duration	Cloud 10ths	Cloud base	Wind Direction	Wind Force	Precip*	Visibility (km)
2014	07/01/2014	JH	1130	1.50	10	600	SW	6	nil	10
	08/01/2014	JH	1430	0.50	5	700	SW	5	nil	10
	15/01/2014	JH	1200	1.00	10	300	SE	5	CHR	2
	20/01/2014	JH	1200	1.00	2	500	SW	3	nil	10
	27/01/2014	JH	0945	3.00	9	400	S	3	nil	10
	06/02/2014	JH	1100	1.00	9	400	SW	4	nil	10
	10/02/2014	JH	1000	0.50	10	300	SW	3	IHR	10
	13/02/2014	JH	0900	2.00	9	400	SW	6	nil	10
	17/02/2014	JH	1000	4.50	10	200	E	5	CLR	2
	20/02/2014	JH	1600	0.50	9	600	SW	5	nil	10
	27/02/2014	JH	1300	1.50	5	600	W	5	nil	10
	25/03/2014	JH	1500	1.00	5	500	W	4	nil	10
	16/10/2014	DJC	1645	1.25	8	400	SE	5	nil	6
	23/10/2014	GC	1045	0.50	9	500	SW	4	nil	4
	23/10/2014	GC	0830	1.00	10	300	SW	2	ILR	2
	12/11/2014	GC	0830	3.00	9	400	SE	5	nil	3
	19/11/2014	DJC	1400	1.50	8	900	SE	6	nil	6
	20/11/2014	DJC	1155	1.75	10	400	SE	3	CLR	2
	11/12/2014	RAS	1200	0.75	8	600	WNW	6	IHH	5
	12/12/2014	RAS	1245	1.00	10	600	W	3	CLR	4
	17/12/2014	IMK	1200	3.00	10	300	W	3	ILR	4
	17/12/2014	IMK	1000	0.50	10	400	W	3	ILR	5
	30/12/2014	KJD	1450	0.50	5	600	SW	4	nil	10
2015	21/01/2015	RAS	1330	2.50	5	600	SE	3	nil	5
	04/02/2015	RAS	1100	3.50	9	1000	NW	1	nil	5
	17/02/2015	RAS	1330	1.00	10	500	SW	4	nil	4
	17/03/2015	RAS	1100	2.50	9	500	SE	3	nil	4
	19/03/2015	RAS	0630	0.50	8	600	SE	1	nil	2
	19/03/2015	RAS	1130	2.50	8	600	SW	3	nil	4
	10/09/2015	RAS	1145	1.50	5	800	SE	5	nil	5
	14/10/2015	RAS	1130	1.00	7	600	SE	3	nil	5
	14/10/2015	RAS	1330	1.00	10	700	SE	3	nil	5
	15/10/2015	RAS	1200	1.00	8	1000	E	3	nil	5
	22/10/2015	SJP	1545	1.00	10	1000	W	4	nil	10
	29/10/2015	SJP	1000	1.00	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)
	11/11/2015	RAS	1615	0.25	10	400	SW	3	IHR	3
	16/11/2015	RAS	1415	0.50	9	500	SW	5	IHR	3
	19/11/2015	SJP	1105	2.25	8	1000	W	4	ILR	10
	24/11/2015	RAS	1000	1.00	9	500	W	4	IHR	4

Year	Date	Obs	Start	Duration	Cloud 10ths	Cloud base	Wind Direction	Wind Force	Precip*	Visibility (km)
	08/12/2015	IMK	1030	0.25	6	1000	SSW	4	nil	5
	08/12/2015	RAS	1100	1.00	5	800	SW	4	nil	5
	09/12/2015	RAS	1100	1.75	9	600	SW	5	nil	5
	10/12/2015	RAS	1000	1.17	4	700	SW	5	nil	5
	10/12/2015	RAS	0730	0.42	8	600	SW	5	nil	1
2016	14/01/2016	RAS	1100	1.00	3	900	NW	3	nil	5
	19/01/2016	RAS	1030	2.00	10	400	SE	3	nil	4
	04/02/2016	RAS	1200	1.00	10	300	W	3	CLR	1
	10/02/2016	RAS	0630	0.50	5	700	NW	3	nil	0.1
	10/02/2016	RAS	0900	0.50	5	800	NW	3	nil	5
	17/03/2016	RAS	0530	0.50	5	200	SE	3	ILF	0.1
	17/03/2016	RAS	0800	1.50	7	300	SE	3	ILF	3
	29/11/2016	JAC	0930	1.00	10	800	SW	1	nil	10
	30/11/2016	JAC	1015	1.25	9	800	SW	4	nil	10
2017	27/01/2017	GC	1300	0.50	5	500	S	5	nil	3
	29/01/2017	GC	1215	1.00	5	700	S	3	nil	5
	30/03/2017	GC	1730	1.00	10	200	S	4	ILR	2
2018	30/01/2018	DJC	1130	3.75	10	900	SW	4	ILR	4
	21/02/2018	DJC	1225	3.25	10	1000	NE	2	nil	6
	12/03/2018	RAS	1430	1.00	5	800	W	2	nil	5
Grand Total				80.08						
*Precipitation codes: <u>C</u> ontinuous/ <u>I</u> ntermittent + <u>L</u> ight/ <u>H</u> heavy + <u>R</u> ain/ <u>S</u> now/ <u>H</u> ail/ <u>F</u> og										

Black grouse

26. Searches for black grouse (*Tetrao tetrix*) were undertaken within suitable habitat in the 1.5 km survey buffer (Figure 1) during the peak period for display activity (lekking) by males between April and May 2014-2016. The methods employed were based on those described in Gilbert *et al.* (1998¹³). Surveys were undertaken during the early morning in calm, dry weather with good visibility. Observers listened and scanned the areas considered suitable for lekking. In total, 50.75 hours was spent searching for black grouse (Table 6).

¹³ Gilbert (n 5) [15]

Table 6. Details of black grouse lek surveys										
Year	Date	Obs	Start time	Duration	Cloud 10ths	Cloud base	Wind Direction	Wind Force	Precip*	Visibility (km)
2014	02/04/2014	JH	0545	1.00	10	200	E	6	nil	5
	07/04/2014	JH	0545	1.00	10	400	SE	3	nil	5
	08/04/2014	JH	0600	1.00	5	500	W	5	IHR	10
	14/04/2014	JH	0545	1.25	8	400	NW	5	ILR	10
	15/04/2014	JH	0500	3.00	0	-	E	3	nil	10
	16/04/2014	JH	0500	3.50	2	800	SE	5	nil	10
	21/04/2014	JH	0500	1.50	2	-	E	6	nil	10
	22/04/2014	JH	0500	2.00	10	600	E	6	nil	10
	28/04/2014	JH	0430	3.00	10	400	E	4	ILR	10
	29/04/2014	JH	0430	2.50	10	200	SE	2	nil	5
	30/04/2014	JH	0445	1.00	9	600	E	3	nil	10
	03/05/2014	JH	0430	2.50	1	-	SE	4	nil	10
	06/05/2014	JH	0500	1.00	10	300	SW	3	nil	10
	08/05/2014	JH	0500	1.00	10	100	-	0	nil	0.1
	12/05/2014	JH	0500	1.00	10	400	SW	1	ILR	10
	14/05/2014	JH	0445	1.00	9	500	-	0	nil	10
2015	21/04/2015	RAS	0500	2.00	1	1000	WNW	1	nil	5
	22/04/2015	RAS	0500	2.00	1	1000	S	1	nil	5
	23/04/2015	RAS	0500	2.00	10	0	W	2	CHF	0.1
	24/04/2015	RAS	0600	2.00	10	100	W	2	IHF	0.3
	13/05/2015	RAS	0445	1.50	9	300	W	3	ILR	3
	14/05/2015	RAS	0515	1.00	5	600	SE	3	nil	5
	15/05/2015	RAS	0600	1.00	8	700	S	3	nil	5
	16/05/2015	RAS	0530	0.75	8	500	W	3	ILR	3
2016	13/04/2016	GC	0600	1.00	10	300	NE	2	CLR	2
	19/04/2016	GC	0530	1.50	6	700	SW	1	nil	4
	25/04/2016	JH	0545	1.00	4	800	NW	4	nil	10
	26/04/2016	JH	0430	2.00	1	-	NW	3	nil	10
	27/04/2016	JH	0445	1.00	1	-	NW	1	nil	10
	05/05/2016	GC	0445	1.50	3	800	SW	2	nil	4
	09/05/2016	GC	0500	1.50	2	800	E	4	nil	5
	12/05/2016	GC	0445	1.75	4	800	E	3	nil	4
Grand Total				50.75						
*Precipitation codes: <u>C</u> ontinuous/ <u>I</u> ntermittent + <u>L</u> ight/ <u>H</u> heavy + <u>R</u> ain/ <u>S</u> now/ <u>H</u> ail/ <u>E</u> og										

Field Survey Results

Divers

Occurrence and status

28. Two species of conservation concern were recorded during the survey period; **red-throated diver** and **black-throated diver**.
29. **Red-throated diver** (Annex 1 and Schedule 1) were present throughout the breeding season, in 2014, 2015, 2016, 2017, 2018 and 2019, and were recorded in flight and on a number of water-bodies around the Site (Confidential Annex 1; Figures 3, 4 and 5; Tables 7, 8, 9, 10, 11, 12, 14 and 15).
30. In 2014 and 2016, at least one pair of red-throated diver attempted to breed within 2 km of the proposed Development. In 2015, two pairs attempted to breed. In 2018, at least four pairs attempted to breed and in 2019 at least three pairs of red-throated diver attempted to breed within 2 km of the proposed Development. , however only one pair attempted to breed within the 500 m buffer. The species was recorded using at least eight different water-bodies of the 15 checked within 2 km of the Site. No successful breeding attempts were recorded.
31. **Black-throated diver** (Annex 1 and Schedule 1) was recorded infrequently during the breeding season in 2014, 2016, 2018 and 2019, and was recorded in flight and on a small number of water-bodies around the Site (Figures 3, 4 and 5; Tables 7, 8 and 10).
32. No black-throated divers attempted to breed within 2 km of the Site; however the species was recorded using at least four different water-bodies of the 15 checked within 2 km of the Site.

Flight activity within FASA

33. Thirteen flights involving eighteen **red-throated divers** were recorded within 500 m of the proposed turbine locations (FASA). Total flight duration of 1,924 seconds was recorded. Of that time 1,364 seconds was spent between 30 – 150 m in height, i.e. at collision risk height. The remaining time was spent either above 150 m or below 30 m in height (Table 9).

Wildfowl

Occurrence and status

34. Three species of conservation concern were recorded during the survey period; **whooper swan** (*Cygnus cygnus*), **barnacle goose** (*Branta leucopsis*) and **Greenland white-fronted goose**. Other wildfowl species recorded are of lesser conservation concern, included greylag goose (*Anser anser*) and goldeneye (*Bucephala clangula*) (Figures 6, 7 and 8; Tables 7, 8, 9, 10, 11, 12, 14 and 15).

35. Thirteen flights involving a total of 287 **whooper swans** (Annex 1 and Schedule 1) were recorded during the course of all surveys. A flock of 20 whooper swans were recorded feeding with Greenland white-fronted geese on 15 December 2015. Small groups of whooper swans, 7, 9 and 4 individuals respectively, were recorded on Loch Chorra-riabhaich and two birds were recorded on Loch Lurach (Figures 6 and 7; Tables 7, 8, 12, 14 and 15).
36. A single skein of 55 **barnacle geese** (Annex 1) was recorded on 12 May 2019 (Figure 6; Tables 7 and 15).
37. One-hundred and fifty-six flights by **Greenland white-fronted goose** (Annex 1) was recorded during the course of all surveys. Greenland white-fronted geese were recorded regularly, throughout the non-breeding season, feeding in the fields around Druimnaleck, Strathnafanaig and Achavallich. Evidence of roosting was recorded on Lochan Tamalabh, Loch Chorra-riabhaich, Loch nan Gad, Lochan a' Chreimh and Dubh Loch. Evidence of night-time feeding was recorded at Loch Chorra-riabhaich, Dubh Loch and the unnamed lochan at NR819557 (Figures 6, 7 and 8; Tables 7, 8, 10, 11, 12, 14 and 15).
38. In total, seventeen records of **greylag geese** were made during the survey period involving a total of 114 birds (Figures 6 and 7; Tables 7, 8 and 15).
39. Two records of a single **goldeneye** were made on 13 February 2014 and 24 April 2019 (Tables 10 and 11).

Flight activity within FASA buffer

40. A single flight by 60 **whooper swan** was recorded within the FASA. A total duration of 8,040 seconds of flight activity was recorded, all of which was spent at collision risk height, i.e. between 30 and 150 m (Table 9).
41. Two flights by **Greenland white-fronted goose** were recorded within the FASA. One flight of twelve birds was recorded at a height greater than 150 m. The second flight, involving two birds, passed through the FASA at a height between 10 – 30 m. Neither flight was at collision risk height (Table 9).
42. Three flights by **greylag goose** were recorded within the FASA. One flight by a single bird was recorded at a height less than 30 m. The second flight, involving two birds, passed through the FASA at a height between 30 - 50 m. The final flight involved eighteen birds was recorded at a height of between 100 – 150 m in height (Table 9).

Scarce raptors and owls

Occurrence and status

43. Seven species of scarce raptor were recorded during surveys: **golden eagle**, **white-tailed eagle** (*Haliaeetus albicilla*), **peregrine**, **goshawk** (*Accipiter gentilis*), **hen harrier**, **osprey** (*Pandion haliaetus*) and **merlin**. Two scarce owl species were recorded: **barn owl** and **short-eared owl** (*Asio flammeus*). Other raptor species of

lesser conservation concern were also recorded, including buzzard (*Buteo buteo*), common kestrel (*Falco tinnunculus*) and sparrowhawk (*Accipiter nisus*) (Confidential Figure 1; Figures 9, 10, 11, 12, 13, 14; Tables 7, 8, 9, 10, 11, 12, 14 and 15).

44. **Golden eagle** (Annex 1 and Schedule 1) was present throughout the survey period and was recorded in flight in and around the Site. A known breeding site is located c.5 km to the southeast and was monitored in 2014, 2015, 2016, 2018 and 2019; no monitoring took place in 2017. In 2014 the territory was occupied by an adult pair but no evidence to suggest that a breeding attempt was made. In 2015 the territory was occupied by an adult pair and incubation was observed on 12 May. By the 29 July 2015 the breeding attempt had failed. In 2016 the territory was occupied by an adult pair and an alternative nest site was being used. The breeding attempt was successful raising one chick. In 2018 the territory was occupied by an adult pair, returning to the preferred nest site. A chick was observed in the nest but presumed the attempt had failed as no further observations of the chick were made after 1 June. In 2019 the territory was occupied by an adult pair but there was no evidence to suggest that a breeding attempt was made (Confidential Figure 1; Figures 9 and 12; Tables 7, 8, 9, 10, 11, 14 and 15).
45. **White-tailed eagle** (Annex 1 and Schedule 1) was recorded on three occasions during the survey period. All records involved immature birds and were seen on 8 April 2014, 9 June 2015 and 8 August 2019 (Figures 11 and 14; Tables 7, 11, 14 and 15).
46. **Peregrine** (Annex 1 and Schedule 1) were recorded on eight occasions during the survey period. Juvenile birds were seen on 7 January 2014 and 21 February 2018, an immature bird was seen on 22 July 2015 and adult birds were seen on 14 May 2015, 14 January 2016, 7 August 2018, 30 August 2018 and 7 August 2019 (Figures 11 and 14; Tables 7, 9, 10, 12 and 15).
47. **Goshawk** (Schedule 1) was recorded on three occasions during the survey period. No evidence of breeding by goshawk was obtained during baseline surveys, despite extensive searches in potential breeding habitat (Figures 11 and 14; Tables 7, 8 and 15).
48. **Hen harrier** (Annex 1 and Schedule 1) was observed regularly during the survey period with the majority of observations made during the breeding season. Evidence of breeding was observed in 2014, 2015, 2018 and 2019. In 2014 a single breeding site was located, successfully fledging two young. In 2015, no breeding site was located; however a pair was observed carrying nesting material on 13 May 2015. In 2018 no breeding site was located; however the pair was seen copulating in suitable breeding habitat. In 2019 a single breeding site was located, successfully fledging one young. There was no evidence of breeding in 2016 despite searches in potential breeding habitat within 2 km of the Site (Confidential Figure 1; Figures 10 and 13; Tables 7, 8, 9, 10, 11, 12, 14 and 15).

49. **Osprey** (Annex 1 and Schedule 1) was recorded on fourteen occasions during the breeding season. No evidence of breeding by osprey was obtained, despite searches in potential breeding habitat within 2 km of the Site (Figures 11 and 14; Tables 7, 8, 9, 10 and 15).
50. **Merlin** (Annex 1 and Schedule 1) was recorded on two occasions during baseline surveys; an adult male was flushed on 6 February 2014 and a juvenile bird was seen on 6 October 2015. No evidence of breeding by merlin was obtained, despite searches in potential breeding habitat within 2 km of the Site (Figures 11 and 14; Tables 7, 9, 14 and 15).
51. One active **barn owl** (Schedule 1) breeding site was identified within the Site. A potentially suitable breeding site was used as a regular roosting site and a potentially suitable site was unused. Two flights by barn owl were recorded on 28 and 29 October 2015. (Confidential Figure 1; Figure 14; Tables 8, 10 and 14).
52. **Short-eared owl** (Annex 1) was recorded on fifteen occasions. The majority of observation were made in 2015 and 2016; no records were made in 2014 and 2019, one record in 2017 and two records in 2018 (Figures 11 and 14; Tables 7, 8, 9, 10, 11, 14 and 15).

Flight activity within FASA

53. Sixteen flights by eighteen **golden eagles** were recorded within the FASA. Of the eighteen individuals recorded seventeen were aged; nine individuals were adults and eight were immatures. A total duration of 3,779 seconds of flight activity was recorded, of which 2,925 seconds was spent at collision risk height (Table 9).
54. Seventy-nine flights by **hen harrier** were recorded the FASA. A total duration of 8,866 seconds of flight activity was recorded. The majority of the flight duration, 7,152 seconds, was spent below 30 m in height and therefore not at risk of collision. The remaining 1,714 seconds was spent at collision risk height (Table 9).
55. One flight by **osprey** was recorded within the FASA. A total duration of 216 seconds of flight activity was recorded, of which 50 seconds was spent at collision risk height, the remaining 166 seconds was at a height greater than 150 m (Table 9).
56. Four flights by **peregrine** were recorded within the FASA. A total of 494 seconds of flight was recorded, of which 170 seconds was spent at collision risk height. The remaining duration was spent either above or below collision risk height (Table 9).
57. One flight by **merlin** was recorded within the FASA. A total duration of 61 seconds of flight activity was recorded; all of which was spent below 10 m in height and therefore not at risk of collision (Table 7).
58. Two flights by **short-eared owl** were recorded within the FASA. A total duration of 64 seconds of flight was recorded; all of which was below 10 m in height and therefore not at risk of collision (Table 7).

Black grouse*Occurrence and status*

59. **Black grouse** (Red list) were recorded within the Site and survey area (i.e. within 1.5 km of the Site) in all years of survey (Figures 15a, 15b, 15c and 16; Tables 7, 8, 9, 10, 11, 12, 13, 14 and 15).
60. Lekking males were observed during dedicated surveys in 2014, 2015 and 2016. However, the number of males attending lek sites was low with the majority of observations being made up of highly dispersed single displaying males. The highest count at a lek site was four males in April 2016.
61. Targeted surveys for 'lekking' (displaying) birds in April and May 2014, located a maximum of four males displaying at three different locations within 1.5 km of the proposed Development. Two leks were of single birds, so called 'singletons', and there was one lek of two birds. In April and May 2015, targeted surveys recorded a maximum of five lekking males within 1.5 km of the proposed Development: all records were of singletons. In April and May 2016, targeted surveys recorded a maximum of four lekking males at one locations within 1.5 km of the proposed Development: other records included two singletons and two males together which were most likely the same males involved in the lek of four described earlier..

Flight activity within FASA

62. Seven flights by **black grouse** were recorded, involving nine birds. Total flight duration was 218 seconds; all of which was below 30 m in height and therefore not at risk of collision (Table 9).

Waders*Occurrence and status*

63. Four species of wader of conservation concern were recorded during baseline surveys; **golden plover** (*Pluvialis apricaria*), **curlew** (*Numenius arquata*), **lapwing** (*Vanellus vanellus*) and **woodcock** (*Scolopax rusticola*). Species of lesser conservation concern that were recorded included; common sandpiper (*Actitis hypoleucos*), redshank (*Tringa totanus*), snipe (*Gallinago gallinago*) and jack snipe (*Lymnocyrtus minimus*) (Figures 17, 18 and 19; Tables 7, 8, 9, 10, 11, 12, 14 and 15).
64. **Golden plover** (Annex 1) was recorded during the non-breeding season and migration; birds seen in April were probably by birds on their northward migration. In total, 54 observations were made involving flocks of between 1 – 600 birds (mean flock size = 86).
65. **Lapwing** (Red list) was recorded on six occasions during the survey period. A nest with eggs was located in June 2015 within the Site. On 25 March 2014 twelve lapwings were recorded roosting at Loch nan Gad. The remaining records involved single birds.

66. **Curlew** (Red list, IUCN near threatened) were recorded infrequently during the survey period. In 2015 a pair of curlew was holding territory near Scotmill but no nest site was found. However a nest site was located in June 2019 close to Loch Cruinn.

67. Two **woodcock** (Red list) were flushed during the course of walked transects on 10 December 2015 and a single bird was flushed on 2 April 2018. No breeding was found as either confirmed or potential during the surveys.

Flight activity within FASA

68. Thirty-five flights by **golden plover** were recorded, involving 4,049 birds. Flight height varied between less than 10 m to greater than 150 m in height (Table 9).
69. Twelve flights by **curlew** were recorded, involving 14 birds. Flight height varied between less than 10 to 50m and 100 to 150 m in height (Table 9).

Other moorland birds

70. Several breeding species of conservation concern (i.e. red listed) were recorded in the 500 m buffer of Site during moorland breeding bird surveys in 2014, 2015 and 2016. These included skylark (*Alauda arvensis*), cuckoo (*Cuculus canorus*), reed bunting (*Emberiza schoeniclus*), starling (*Sturnus vulgaris*) and grasshopper warbler (*Locustella naevia*) (Figure 19).

Other species

71. Other species recorded during flight activity surveys included buzzard, raven (*Corvus corax*), common kestrel, sparrowhawk, herring gull (*Larus argentatus*), common gull (*L. canus*), lesser black-backed gull (*L. fuscus*) and grey heron (*Ardea cinerea*). All these species are common and distributed throughout Scotland (Table 15).

Tables 7- 15

Table 7. Flight durations of all <i>target species</i> observed from Generic Vantage Points (GVPs).*											
Species	Season	VP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Barnacle goose	Apr-Aug	2	1	55							*
Total			1	55							*
Black grouse	Apr-Aug	9	2	2	61	61					
		10	2	2	51	20	31				
	Sep-Mar	2	1	1	17	17					
		9	2	2	31	31					
		10	3	5	163	77	86				
Total			10	12	323	206	117				
Black-throated diver	Apr-Aug	11	2	8	1944	80	575		1105	184	
Total			2	8	1944	80	575		1105	184	
Curlew	Apr-Aug	9	3	5		*	*	*			
		10	3	3		*	*			*	
		11	9	9		*	*	*		*	
Total			15	17		*	*	*		*	
Golden eagle	Apr-Aug	2	3	4	1245				15	232	998
		4	3	4	1073	4			79	325	665
		9	5	6	1650	16	151	351	823	136	173
		11	7	7	1548	91	674	511	272		
	Sep-Mar	2	1	2	164				164		
		4	1	1	45				45		
		9	5	6	2106	350	137	831	788		
		10	5	5	890	263	248	204	175		
		11	4	4	404	156		62	186		
Total			34	39	9125	880	1210	1959	2547	693	1836
Golden plover	Apr-Aug	2	1	20		*					
		9	1	11			*				
		11	6	104		*	*	*		*	*
	Sep-Mar	9	1	12		*					
		11	27	3922		*	*	*	*	*	*
Total			36	4069		*	*	*	*	*	*
Goshawk	Sep-Mar	2	1	1	98		82	16			
		4	1	1	129	32	81	16			
Total			2	2	227	32	163	32			
Greenland white-fronted goose	Apr-Aug	1	10	483		*	*				
	Sep-Mar	1	10	747		*	*	*	*	*	
		2	5	131				*	*		
		10	1	12							*

Table 7. Flight durations of all <i>target species</i> observed from Generic Vantage Points (GVPs).*											
Species	Season	VP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
		11	1	2			*				
Total			27	1375		*	*	*	*	*	*
Greylag goose	Apr-Aug	1	1	4				*			
		2	3	5		*	*		*		
		9	1	1		*	*				
	Sep-Mar	9	1	2				*			
		11	1	18						*	
Total			7	30		*	*	*	*	*	
Hen harrier	Apr-Aug	1	10	10	1407	1267	107		33		
		2	24	24	1994	859	200	255	327	353	
		4	4	4	459	18	52	354	35		
		9	48	48	8130	4280	974	758	1036	1004	78
		10	3	3	505	426	79				
		11	10	10	1018	405	125	48	68	296	76
	Sep-Mar	1	6	6	427	427					
		2	3	3	284		61	152	71		
		4	3	3	192	81	111				
		9	9	9	1163	651	206	63	76	30	137
		10	15	15	1742	1377	253	112			
		11	6	6	428	395	33				
Total			141	141	17749	10186	2201	1742	1646	1683	291
Merlin	Sep-Mar	9	1	1	61	61					
Total			1	1	61	61					
Osprey	Apr-Aug	2	3	3	403		341	16	46		
		4	1	1	38				38		
		9	1	1	514		30		136	106	242
	Sep-Mar	4	1	1	45			45			
Total			6	6	1000		371	61	220	106	242
Peregrine	Apr-Aug	9	2	2	352	70				16	266
		10	1	1	250	16			234		
	Sep-Mar	11	1	1	46	46					
Total			4	4	648	132			234	16	266
Red-throated diver	Apr-Aug	2	3	4	261				52	146	63
		4	28	45	7487		61	528	2720	3604	574

Table 7. Flight durations of all <i>target species</i> observed from Generic Vantage Points (GVPs).*															
Species	Season	VP	No of flights	No of birds	Total fly time (s)	Height class									
						<10m	10-30m	30-50m	50-100m	100-150m	>150m				
						9	12	19	3638	62	439	637	1726	524	250
						10	1	2	450			120	330		
	11	16	26	4800	81	675	275	1221	1093	1455					
	Sep-Mar	9	1	1	310				124	78	108				
Total			61	97	16946	143	1175	1560	6173	5445	2450				
Diver sp.	Apr-Aug	2	1	1	183					183					
		4	1	1	316			15	211	90					
Total			2	2	499			15	211	273					
Short-eared owl	Apr-Aug	11	3	3	256	256									
Total			3	3	256	256									
White-tailed eagle	Apr-Aug	11	1	1	578						578				
Total			1	1	578						578				
Whooper swan	Sep-Mar	11	1	60	8040			4020	4020						
Total			1	60	8040			4020	4020						
*Observed flight activity, timings and heights refer to <u>all</u> flights observed from VPs. It should be noted that flight activity and timings could reduce, due to clipping flights to the 500 m flight activity buffer and viewshed, from that recorded in the field when it comes to analysing these data in a CRM (see Table 9).															

Table 8. Flight durations of all <i>target species</i> observed from Focal Vantage Points (FVPs).											
Species	Season	VP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Barn owl	Sep-Mar	NW1	2	2	145	145					
Total			2	2	145	145					
Black grouse	Sep-Mar	NW1	1	1	7	7					
Total			1	1	7	7					
Black-throated diver	Apr-Aug	D1	1	1	127	32	95				
		EA1	2	3	58	20	38				
Total			3	4	185	52	133				
Golden eagle	Apr-Aug	D2	2	2	55	55					
		EA1	4	4	1101	32	232	220	617		
	Sep-Mar	EA1	3	3	122	25	16		81		
		NW1	4	4	724	90	212	332	90		
Total			13	13	2002	202	460	552	788		
Golden plover	Apr-Aug	EA1	1	60							
	Sep-Mar	NW2	5	410		*	*	*	*		
Total			6	470		*	*	*	*		
Goshawk	Sep-Mar	NW1	1	1		*	*				
Total			1	1		*	*				
	Apr-Aug	NW1	4	364		*	*	*			

Table 8. Flight durations of all <i>target species</i> observed from Focal Vantage Points (FVPs).											
Species	Season	VP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Greenland white-fronted goose	Sep-Mar	NW3	2	72				*		*	
		NW1	93	6724		*	*	*	*	*	*
		NW2	16	818		*	*	*	*		
		NW3	2	60			*				
Total			117	8038		*	*	*	*	*	*
Greylag goose	Sep-Mar	NW1	5	45		*	*	*	*		
		NW2	3	11		*	*		*		
		NW3	2	28			*				
Total			10	84		*	*	*	*		
Hen harrier	Apr-Aug	D2	1	1	334	304	30				
	Sep-Mar	NW1	8	8	181	98	83				
Total			9	9	515	402	113				
Osprey	Apr-Aug	D1	2	2	362		106	30	226		
		D3	2	2	548		98	105	60	45	240
Total			4	4	910		204	135	286	45	240
Red-throated diver	Apr-Aug	D1	20	27	2256	22	718	289	867	150	210
		D2	3	5	834			15	243	500	76
		D3	10	13	1933	117	571	438	593	214	
		D4	4	4	85	22	63				
		D5	3	3	195		178	17			
		EA1	2	2	225		109	116			
	Sep-Mar	EA1	2	4	940		30	182	334	274	120
		NW2	1	1	81			16	65		
Total			45	59	6549	161	1669	1073	2102	1138	406
Short-eared owl	Apr-Aug	EA1	1	1	65	49	16				
	Sep-Mar	NW2	6	7	228	228					
Total			7	8	293	277	16				
Whooper swan	Sep-Mar	NW1	7	29	1416		76	272	668	400	
		NW2	4	168	1413	144	279	990			
Total			11	197	2829	144	355	1262	668	400	

Table 9. Flight durations recorded within VP viewsheds and clipped to 500 m flight activity survey buffer. Part, or all, of these flights at a height of 10 – 150 m agl places them at risk of a collision with the turbine blades (shaded columns).											
Species	Season	GVP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Black grouse	Apr-Aug	9	2	2	47	47					
		10	1	1	5	5					
	Total		3	3	52	52					
	Sep-Mar	9	1	1	18	18					
		10	3	5	148	71	77				
	Total		4	6	166	89	77				
Total			7	9	218	141	77				
Curlew	Apr-Aug	9	3	5		*	*	*			
		10	2	2		*				*	
		11	7	7		*	*	*		*	
	Total		12	14		*	*	*		*	
Total			12	14		*	*	*		*	
Golden eagle	Apr-Aug	9	4	5	1252	16	91	331	724	90	
		11	2	2	441	58	174	30	121	57	
	Total		6	7	1692	74	265	361	845	147	
	Sep-Mar	9	5	6	1431	165	167	138	426	535	
		10	4	4	408	61	122	87	138		
		11	1	1	248			62	186		
	Total		10	11	2087	226	289	287	750	535	
Total			16	18	3779	300	554	648	1595	682	
Golden plover	Apr-Aug	9	1	11			*				
		11	6	104		*	*	*		*	*
	Total		7	115		*	*	*		*	*
	Sep-Mar	9	1	12		*					
		11	27	3922		*	*	*	*	*	*
	Total		28	3934		*	*	*	*	*	*
Total			35	4049		*	*	*	*	*	*
Greenland white-fronted goose	Sep-Mar	10	1	12							*
		11	1	2			*				
	Total		2	14			*				*
Total			2	14			*				*
Greylag goose	Apr-Aug	9	1	1		*	*				
	Total		1	1		*	*				
	Sep-Mar	9	1	2				*			

Table 9. Flight durations recorded within VP viewsheds and clipped to 500 m flight activity survey buffer. Part, or all, of these flights at a height of 10 – 150 m agl places them at risk of a collision with the turbine blades (shaded columns).											
Species	Season	GVP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
		11	1	18						*	
	Total		2	20				*		*	
Total			3	21		*	*	*		*	
Goose sp.	Apr-Aug	2	1	2						*	
	Total		1	2						*	
Total			1	2						*	
Hen harrier	Apr-Aug	1	1	1	38	28	10				
		2	2	2	36	1				35	
		9	43	43	5831	3326	907	426	441	731	
		10	2	2	180	128	52				
		11	6	6	530	530					
	Total		54	54	6615	4013	969	426	441	766	
	Sep-Mar	9	8	8	775	678	97				
		10	13	13	1156	867	208	81			
		11	4	4	320	287	33				
	Total		25	25	2251	1832	338	81			
Total			79	79	8866	5845	1307	507	441	766	
Merlin	Sep-Mar	9	1	1	61	61					
	Total		1	1	61	61					
Total			1	1	61	61					
Osprey	Apr-Aug	9	1	1	216				35	15	166
	Total		1	1	216				35	15	166
Total			1	1	216				35	15	166
Peregrine	Apr-Aug	9	2	2	336	55				16	265
		10	1	1	154				154		
	Total		3	3	490	55			154	16	265
	Sep-Mar	11	1	1	4	4					
	Total		1	1	4	4					
Total			4	4	494	59			154	16	265
Red-throated diver	Apr-Aug	9	10	15	1346	32	355	395	512	52	
		10	1	1	226				226		
		11	1	1	118						118
	Total		12	17	1690	32	355	395	738	52	118
	Sep-Mar	9	1	1	234				101	78	55
	Total		1	1	234				101	78	55
Total			13	18	1924	32	355	395	839	130	173
Diver sp.	Apr-Aug	2	1	1	10					10	
	Total		1	1	10					10	

Table 9. Flight durations recorded within VP viewsheds and clipped to 500 m flight activity survey buffer. Part, or all, of these flights at a height of 10 – 150 m agl places them at risk of a collision with the turbine blades (shaded columns).

Species	Season	GVP	No of flights	No of birds	Total fly time (s)	Height class					
						<10m	10-30m	30-50m	50-100m	100-150m	>150m
Total			1	1	10					10	
Short-eared owl	Apr-Aug	11	2	2	64	64					
	Total		2	2	64	64					
Total			2	2	64	64					
Whooper swan	Sep-Mar	11	1	60	8040			4020	4020		
	Total		1	60	8040			4020	4020		
Total			1	60	8040			4020	4020		

Table 10. Scarce Breeding Bird survey results, 2014-2019.

Date	Species	No.	Behaviour	Signs	Comments
23/03/2014	Barn owl			Pellets	Fresh pellets
02/04/2018	Barn owl	1	Roost	Faeces, Pellets	Roof almost off cottage
11/07/2018	Barn owl	1	Flying		Flew out of Scotmill
11/07/2018	Barn owl	0		Feathers, Pellets	Potential breeding site
04/06/2019	Barn owl	0		No signs	Checked out old building Suitable Not present
24/02/2014	Black grouse	1	Roost		In tree by track.
24/04/2015	Black grouse	1	Display		
24/04/2015	Black grouse	1	Flushed		Same as above. Flushed by another surveyor in area.
07/07/2015	Black grouse	1	Hunt/feed		
22/06/2016	Black grouse	1	Flying		Flushed
02/04/2018	Black grouse	1	Flying		Flushed from restock next to track
02/04/2018	Black grouse	0		Faeces	Restock area
02/04/2018	Black grouse	0		Faeces	Forest edge
15/04/2018	Black grouse	1	Flying		
08/05/2018	Black grouse	1	Flying		Landed
09/05/2018	Black grouse	1			Walking on forest track
30/08/2018	Black grouse	2			
29/04/2019	Black grouse	1			Flushed
13/05/2019	Black grouse	1	Hunt/feed		At roadside
14/05/2019	Black grouse	1	Hunt/feed		At roadside
03/06/2019	Black grouse	1	Flying		Flushed from bracken
04/06/2019	Black grouse	1	Flying		Flushed from track
12/06/2019	Black grouse	1			On track
12/06/2014	Black-throated diver	1	Flying		Flying over (off?).
27/05/2016	Black-throated diver	1			On loch
21/06/2016	Black-throated diver	5	Display		Probably failed breeding birds
10/07/2018	Black-throated diver	1	Display, Territorial		BV appears to be displaying to RH
13/07/2019	Black-throated diver	0		No signs	
14/07/2019	Black-throated diver	1	Roost, Hunt/feed		No evidence of breeding
14/07/2019	Black-throated diver	0		No signs	
09/05/2018	Common gull	4	Territorial	Nest with eggs	

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
05/06/2018	Common gull	1	Nest build		
24/04/2019	Common gull	2		Nest	
24/04/2019	Common gull	2			
28/04/2019	Common gull	4			
29/04/2019	Common gull	4	Roost		
13/05/2019	Common gull	4			2 pairs
13/05/2019	Common gull	4			2 pairs
14/05/2019	Common gull	2			
19/06/2019	Common gull	2	Agitated/alarm, Vocalise	Nest w young	
29/04/2019	Common sandpiper	1	Roost		
14/05/2019	Common sandpiper	1	Display		
21/06/2016	Curlew	1	Agitated/alarm		
09/05/2018	Curlew	1	Territorial, Vocalise		
19/06/2019	Curlew	2	Agitated/alarm, Vocalise	Nest w young	Alarmed by another surveyor
20/01/2014	Golden eagle			No signs	Creag Mhor to check for evidence of EA and watch over Crossaig Glen
27/02/2014	Golden eagle			No signs	EA watch over Crossaig Glen from vantage point
24/02/2014	Golden eagle	1	Display	Old nest (prev. yr)	Display flight (50-100m). Creag Mhor - landed. Observations made during EA watch from Creag Mhor.
24/02/2014	Golden eagle	1	Flying		Flew over forest to South and landed. Observations made during EA watch from Creag Mhor. 10.00-13.00 hrs.
31/03/2014	Golden eagle	1	Flying		Flew past eyrie.
31/03/2014	Golden eagle	1	Flying		Landed on eyrie
31/03/2014	Golden eagle	1	Flying		Flew off eyrie
31/03/2014	Golden eagle	2	Flying, Territorial		Adult mobbing juv. Then flew off to South.
31/03/2014	Golden eagle	1	Flying		Prolonged flight in Crossaig Glen then flew off to the South.
26/03/2014	Golden eagle			No signs	Observations from Creag Mhor.
23/03/2014	Golden eagle	2	Flying		Short flights from trees to eyrie.
12/03/2014	Golden eagle	1	Display		Brief display flight to eyrie.
12/03/2014	Golden eagle	1	Flying		Off eyrie to Crossaig Glen then to open moorland to West. 50-100 to 100-150 to 150. Then to 100-150 then 50-100.
24/04/2014	Golden eagle	2	Flying		Over Creag Mhor to South to Crossaig Glen.
17/04/2014	Golden eagle	2	Flying, Display		Male. Occasional display for 45 mins - joined by adult female at 1510.
17/04/2014	Golden eagle	2	Flying		
15/04/2014	Golden eagle	1	Flying		Creag Mhor to Crossaig Glen.
10/04/2014	Golden eagle	1	Flying		Short flights to and from eyrie - Landing on eyrie - not incubating.
10/04/2014	Golden eagle	1	Flying		Flying in vicinity of eyrie.
04/04/2014	Golden eagle			No signs	Checked eyrie from Creag Mhor - no birds present.
09/05/2014	Golden eagle			No signs	Observations for HH/EA from VP

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
13/05/2014	Golden eagle			No signs	EA observation from Creag Mhor - no signs in vicinity of eyrie.
20/06/2014	Golden eagle			No signs	Observations (1430-1730) from VPx - East to Crossaig Glen.
05/02/2015	Golden eagle	1	Territorial	Used nest (this yr)	
12/05/2015	Golden eagle	1	Incubate		
09/06/2015	Golden eagle	0		Nest failed	
30/07/2015	Golden eagle	0		Nest failed	Checked nest area (nil) feathers etc.
15/02/2016	Golden eagle	0		No signs	EA nest at Crossaig Glen. 2 other surveyors also scanning the area
15/03/2016	Golden eagle	1	Territorial	Used nest (this yr)	Nest appears fresh build
15/03/2016	Golden eagle	2	Territorial		Being harassed by corvids
15/03/2016	Golden eagle	1	Territorial		Standing on nest
15/03/2016	Golden eagle	1	Territorial		Leaving area
15/03/2016	Golden eagle	1	Territorial		Perches above nest
08/04/2016	Golden eagle	1	Flying		Mobbed by 3 RN
08/04/2016	Golden eagle	1	Flying		
08/04/2016	Golden eagle	2	Flying		
25/04/2018	Golden eagle	1	Flying,Hunt/feed		
25/04/2018	Golden eagle	2	Incubate, Territorial	Nest with eggs	Changeover Male relieving female
25/04/2018	Golden eagle	1	Flying		
29/05/2018	Golden eagle	1		Nest w young	1 chick definite
14/04/2018	Golden eagle	1	Flying		
16/04/2018	Golden eagle	1	Flying		
10/05/2018	Golden eagle	1	Flying		Mobbed by BZ & RN. 2 dead sheep below Scotsmill
01/06/2018	Golden eagle	1		Nest w young	One chick Adult below nest in tree canopy
04/06/2018	Golden eagle	1	Flying		
04/06/2018	Golden eagle	1	Flying,Hunt/feed		In moult
04/06/2018	Golden eagle	1	Flying,Hunt/feed		In moult
05/06/2018	Golden eagle	1	Flying		Possible flyover BZs mobbing
08/06/2018	Golden eagle	1	Flying		
08/06/2018	Golden eagle	1	Flying		
09/06/2018	Golden eagle	1	Flying		Mobbed by 2 HH & 2 BZ
09/06/2018	Golden eagle	1	Flying		Mobbed by HH, 3RN & BZ
07/08/2018	Golden eagle	1	Flying		
07/08/2018	Golden eagle	1	Flying		
07/08/2018	Golden eagle	1	Flying		Landed
07/08/2018	Golden eagle	1	Perch		
07/08/2018	Golden eagle	1	Flying		15 minutes flight
07/08/2018	Golden eagle	1	Flying		
03/06/2019	Golden eagle	0		Feathers	
15/04/2018	Golden plover	30	Flying		
16/04/2018	Golden plover	30	Agitated/alarm		
24/04/2019	Goldeneye	1			
09/05/2014	Goshawk	1	Flying		Over Lochan Chreimh - carrying prey.
09/05/2014	Goshawk			No signs	Walked forest rides and clearing to search for signs of GI - no signs.
19/06/2014	Goshawk			No signs	Searched ride/forest edge for GI signs.

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
25/06/2014	Goshawk			No signs	Searched for signs along forest ride where previous sightings of displaying GI male.
14/05/2019	Greylag goose	2	Roost		
23/03/2014	Hen harrier	1	Flying		
17/04/2014	Hen harrier	1	Flying		
17/04/2014	Hen harrier	3	Flying		
17/04/2014	Hen harrier	1	Flying		
15/04/2014	Hen harrier	2	Flying		Over Fuar Larach.
09/05/2014	Hen harrier	1	Flying		Sout to North over Cnoc Breacam
09/05/2014	Hen harrier	1	Flying		Gleann Callich Mor to Cruach Tamalabh to join perched adult female-pair in vicinity of probable nest site (1725-1740)
09/05/2014	Hen harrier	1	Flying		West of Cruach Tamalabh
21/05/2014	Hen harrier	1	Flying		
21/05/2014	Hen harrier	1	Flying		Food pass to female.
21/05/2014	Hen harrier	1	Flying		From proposed nest site?
21/05/2014	Hen harrier	1	Flying		Back to possible nest site.
21/05/2014	Hen harrier	2	Flying		
21/05/2014	Hen harrier	1	Flying		Long, high (>150m) flight to SW (open hill).
20/06/2014	Hen harrier	2	Flying		Pair flying in vicinity of nest (1440-1455)
20/06/2014	Hen harrier	1	Flying		Flying in vicinity of nest.
20/06/2014	Hen harrier	1	Flying		Landed near nest
20/06/2014	Hen harrier	1	Flying		Flew off NE
28/07/2014	Hen harrier	1	Agitated/alarm		Alarming near nest site.
28/07/2014	Hen harrier	1	Agitated/alarm		Alarming near nest site - no sign of juveniles.
30/07/2014	Hen harrier	2		Recent fledgings	2 fledged juvs flying near nest site.
20/04/2015	Hen harrier	1			High soaring >150
20/04/2015	Hen harrier	1			High soaring >150
23/04/2015	Hen harrier			No signs	Area of ungrazed heather in forest clearing
24/04/2015	Hen harrier	1	Hunt/feed		
12/05/2015	Hen harrier	0		No signs	HH search. Nil result
13/05/2015	Hen harrier	2	Territorial		Carrying nesting material
15/05/2015	Hen harrier	1	Hunt/feed		
15/05/2015	Hen harrier	1	Hunt/feed		
15/05/2015	Hen harrier	1	Hunt/feed		
09/06/2015	Hen harrier	0		No signs	HH nil result
23/06/2015	Hen harrier	1	Hunt/feed		
29/06/2015	Hen harrier	0		No signs	Scanned area for HH. Nil result
02/04/2018	Hen harrier	1	Flying		
02/04/2018	Hen harrier	1	Flying		Same bird as 17:59
25/04/2018	Hen harrier	1	Flying,Hunt/feed		<10m
09/05/2018	Hen harrier	2	Territorial, Display		Male seeing off BZ. Into heather several times Nest selecting
16/04/2018	Hen harrier	1	Flying,Hunt/feed		
16/04/2018	Hen harrier	1	Flying		
08/05/2018	Hen harrier	2			Copulating
08/05/2018	Hen harrier	2	Flying		
08/05/2018	Hen harrier	1	Display		Sky dancing
08/05/2018	Hen harrier	1	Hunt/feed		
08/05/2018	Hen harrier	1	Display		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
08/05/2018	Hen harrier	1	Display		
08/05/2018	Hen harrier	1	Display		
09/05/2018	Hen harrier	1	Flying,Hunt/feed		
10/05/2018	Hen harrier	1	Flying		Sky dancing
10/05/2018	Hen harrier	1	Flying		
10/05/2018	Hen harrier	1	Hunt/feed		
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Flying		Very high & direct
10/05/2018	Hen harrier	1	Flying		
10/05/2018	Hen harrier	1	Hunt/feed		
10/05/2018	Hen harrier	1	Display		18 min flight
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	2	Display		
10/05/2018	Hen harrier	2	Display		
10/05/2018	Hen harrier	2	Display		
10/05/2018	Hen harrier	2	Display		Courtship behaviour
10/05/2018	Hen harrier	1	Hunt/feed		
10/05/2018	Hen harrier	2	Hunt/feed		Food pass
10/05/2018	Hen harrier	1	Flying		
10/05/2018	Hen harrier	2	Display		Copulating pair
10/05/2018	Hen harrier	1	Display		
10/05/2018	Hen harrier	1	Display		
04/06/2018	Hen harrier	1	Perch		
04/06/2018	Hen harrier	1	Flying		Lazy flight
05/06/2018	Hen harrier	1	Hunt/feed		Went to ground at loch
05/06/2018	Hen harrier	1	Hunt/feed		Hunting over power cable track
08/06/2018	Hen harrier	1	Flying,Territorial		Mobbing EA 4 mins
08/06/2018	Hen harrier	1	Flying,Territorial		Mobbing EA 11 mins
08/06/2018	Hen harrier	1	Flying,Hunt/feed		Made kill, ate it and flew back onto hill. No food pass
08/06/2018	Hen harrier	1	Perch	Kill/prey	Landed to eat prey
08/06/2018	Hen harrier	1	Flying		Flew back on to hill
09/06/2018	Hen harrier	1	Flying,Hunt/feed		
09/06/2018	Hen harrier	2	Flying,Territorial		Mobbing EA
09/06/2018	Hen harrier	1	Flying,Territorial		Mobbing EA
09/06/2018	Hen harrier	1	Flying,Territorial		Chasing HC
07/08/2018	Hen harrier	1	Flying,Hunt/feed		
15/08/2018	Hen harrier	1			
29/08/2018	Hen harrier				
23/04/2019	Hen harrier	1	Flying		
23/04/2019	Hen harrier	1	Flying,Hunt/feed		Foraging along burn
23/04/2019	Hen harrier	1	Flying		
25/04/2019	Hen harrier	1	Flying		
03/06/2019	Hen harrier	1	Flying,Hunt/feed		
03/06/2019	Hen harrier	1	Flying,Hunt/feed		
03/06/2019	Hen harrier	1	Flying		10 minutes Landed

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
03/06/2019	Hen harrier	1	Flying		15 minutes Landed
03/06/2019	Hen harrier	1	Agitated/alarm, Flying, Vocalise		13 min Left area on my approach
03/06/2019	Hen harrier	1	Flying		
03/06/2019	Hen harrier	2	Hunt/feed, Incubate		Food pass
04/06/2019	Hen harrier	1	Flying		
04/06/2019	Hen harrier	1	Territorial, Nest build		Taking material to nest
04/06/2019	Hen harrier	1	Incubate, Nest build		Twice into nest did not leave after 2nd trip
04/06/2019	Hen harrier	1	Flying		Over nest
11/06/2019	Hen harrier	2			Food pass
11/06/2019	Hen harrier	1			Male mobbed RN
20/06/2019	Hen harrier	1	Flying, Hunt/feed	Kill/prey	No food pass! Lands & eats prey item then preens still there at 1040
04/07/2019	Hen harrier	2	Agitated/alarm, Chick tend		
13/07/2019	Hen harrier	0		No signs	Bred successfully here in 2014
13/07/2019	Hen harrier	0		Nest w young	Young seen 12/7 from VP2
13/07/2019	Hen harrier	1	Flying		In vicinity of nest
08/08/2019	Hen harrier	0		Used nest (this yr)	Fledged juv seen from VPs, prob only 1 survived
27/05/2016	Herring gull	4	Flying		
04/06/2018	Kestrel	2	Perch		Might be breeding in sheepfold
05/06/2018	Kestrel	1	Hunt/feed		
09/06/2018	Kestrel	1	Flying, Hunt/feed	Kill/prey, Nest	Nesting in sheepfold under water tank
31/08/2018	Kestrel	1	Flying, Hunt/feed		Present regularly
30/05/2016	Lapwing	1	Territorial, Display		
26/04/2019	Little grebe	1			Calling
29/04/2019	Little grebe	4			
09/05/2018	Mallard	2			
14/05/2019	Mallard	2			On loch
23/06/2015	Merlin	0		No signs	Nil result
21/05/2014	Osprey	1	Flying		Flew down towards Loch Gatha then circled very high (>150m) then direct flight North.
14/05/2014	Osprey	1	Hunt/feed		
23/06/2015	Osprey	0		No signs	Nil result
11/05/2018	Osprey	1	Flying		
07/08/2018	Peregrine	1	Flying		
30/08/2018	Peregrine	1			
04/08/2014	Red grouse	1		Recent fledgings	Fledged brood.
09/05/2018	Red grouse	2	Flying		
15/04/2014	Red-throated diver	2	Roost		
09/05/2014	Red-throated diver	2	Roost		
09/05/2014	Red-throated diver	2	Roost		
09/05/2014	Red-throated diver			No signs	
09/05/2014	Red-throated diver			No signs	
09/05/2014	Red-throated diver			No signs	
14/05/2014	Red-throated diver	2	Roost		
14/05/2014	Red-throated diver	2	Roost		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
21/05/2014	Red-throated diver			No signs	
04/06/2014	Red-throated diver	2	Roost		No evidence of breeding on either of above lochans.
04/06/2014	Red-throated diver			No signs	No evidence of breeding on either of above lochans.
09/06/2014	Red-throated diver	2	Roost		
09/06/2014	Red-throated diver	2	Roost		
12/06/2014	Red-throated diver	1	Roost		
12/06/2014	Red-throated diver	1	Incubate	Nest with eggs	Sitting bird on island
12/06/2014	Red-throated diver	2	Roost, Flying, Display		Off duty bird displaying with one of pair.
12/06/2014	Red-throated diver	1	Roost		
12/06/2014	Red-throated diver	2	Flying		Pair from Lochan a' Chreimh? Over Lochan Fraoich to NE (100-150m)-bird on lochan did not respond to calling birds overhead-no signs of nest on Lochan Fraoich.
15/06/2014	Red-throated diver	1	Incubate		
16/06/2014	Red-throated diver	2	Roost		
18/06/2014	Red-throated diver	1	Incubate		Bird sitting Lochan a' Chreimh
23/06/2014	Red-throated diver	2	Roost, Flying		Pair flew off Loch Lurach (100-150m) to NW towards West Loch Tarbet.
23/06/2014	Red-throated diver			No signs	RH. No birds present-at nest or on loch-checked again at 1700-still no birds.
23/06/2014	Red-throated diver			No signs	RH
30/04/2016	Red-throated diver			No signs	No bird on nest. Lochan a' Chreimh. Bird seen flying off Locahn at 1315 from VP4.
18/07/2014	Red-throated diver	1	Territorial		No chick seen but site still in use by RV. Site covered from forestry to East.
02/07/2014	Red-throated diver	2	Roost		None on nest.
02/07/2014	Red-throated diver			Nest failed	Nest checked - no birds present - 2 intact eggs in nest on island - may have deserted.
05/07/2014	Red-throated diver	2	Roost		
05/07/2014	Red-throated diver			Nest failed	No incubating bird.
07/07/2014	Red-throated diver	1	Incubate		Checked nest again with telescope (intermittent incubation.
09/07/2014	Red-throated diver	1	Incubate		Checked nest again with telescope - bird sitting - due to hatch any day now.
11/07/2014	Red-throated diver	1	Incubate		Bird still sitting - due to hatch.
11/07/2014	Red-throated diver	1	Roost		
28/07/2014	Red-throated diver	2	Roost		
28/07/2014	Red-throated diver	2	Roost		
28/07/2014	Red-throated diver			Nest failed	
28/07/2014	Red-throated diver			No signs	No sign of adult or chick - watched until 1530.
30/07/2014	Red-throated diver			No signs	No sign of RH adults or chick.
04/08/2014	Red-throated diver			No signs	
05/08/2014	Red-throated diver			No signs	
05/08/2014	Red-throated diver	3	Roost, Flying		Lochan Fraoich to SSE (50-100 to 100-150).
12/05/2015	Red-throated diver	0		No signs	
12/05/2015	Red-throated diver	0		No signs	
12/05/2015	Red-throated diver	2	Display		
12/05/2015	Red-throated diver	0		No signs	
12/05/2015	Red-throated diver	2	Territorial		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
12/05/2015	Red-throated diver	0		No signs	
21/05/2015	Red-throated diver	0		No signs	No RH or any other key species
29/05/2015	Red-throated diver	3	Display, Roost		3 RH displaying together
29/05/2015	Red-throated diver	3	Flying, Display		1 flew in direction of Lochan Fraoich. Pair displaying near island on Lochan a Chreimh
23/06/2015	Red-throated diver	0		No signs	
23/06/2015	Red-throated diver	0		No signs	
24/06/2015	Red-throated diver	2	Territorial	Nest failed	Nest failed?
24/06/2015	Red-throated diver	1	Incubate		
26/06/2015	Red-throated diver	0		No signs	
26/06/2015	Red-throated diver	0		No signs	Large loch
26/06/2015	Red-throated diver	0		No signs	Small lochan
07/07/2015	Red-throated diver	0			
07/07/2015	Red-throated diver	1	Flying		
07/07/2015	Red-throated diver	1	Territorial		
07/07/2015	Red-throated diver	0		Nest failed	Nest flooded. No eggs
29/07/2015	Red-throated diver	0			
29/07/2015	Red-throated diver	0			
29/07/2015	Red-throated diver	0			
29/07/2015	Red-throated diver	0			
06/08/2015	Red-throated diver	2	Territorial		Loafing on loch
06/08/2015	Red-throated diver	2	Territorial		Loafing on loch
12/08/2015	Red-throated diver	2	Territorial		
12/08/2015	Red-throated diver	0			Nil result
25/04/2016	Red-throated diver	2	Vocalise, Flying		Not seen flying over
25/04/2016	Red-throated diver	2	Roost		
13/05/2016	Red-throated diver	2	Vocalise		
27/05/2016	Red-throated diver	1			On loch
27/05/2016	Red-throated diver	2			On loch
30/05/2016	Red-throated diver	1			On loch
02/06/2016	Red-throated diver	1			On loch
20/06/2016	Red-throated diver	1			On nest
22/06/2016	Red-throated diver			Nest failed	No sign of eggs but otter prints all over peat area
22/06/2016	Red-throated diver	1			On loch
25/04/2018	Red-throated diver	2	Flying, Vocalise		50-100m then > 100m
09/05/2018	Red-throated diver	1	Territorial		
09/05/2018	Red-throated diver	2	Territorial		
09/05/2018	Red-throated diver	2	Territorial		
09/05/2018	Red-throated diver	2	Territorial, Roost		
10/05/2018	Red-throated diver	2	Flying		
01/06/2018	Red-throated diver	1	Territorial, Roost		Male on watch - no sign of female
01/06/2018	Red-throated diver	0		Nest	Suspect nesting on back of Island
01/06/2018	Red-throated diver	2	Territorial		In small inlet but no alarming
05/06/2018	Red-throated diver	2			Not nesting yet
05/06/2018	Red-throated diver	1	Incubate	Nest	
05/06/2018	Red-throated diver	1	Flying		
05/06/2018	Red-throated diver	2	Flying, Agitated/al arm		Both birds took off flew around loch and landed EA nearby but out of sight
05/06/2018	Red-throated diver	1	Flying, Agitated/al arm		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
05/06/2018	Red-throated diver	2	Flying		
05/06/2018	Red-throated diver	2	Incubate		1 bird incubating 1 bird on lookout
05/06/2018	Red-throated diver	1	Flying		1 bird flew off Heard - not seen
10/07/2018	Red-throated diver	2	Flying		
10/07/2018	Red-throated diver	1	Flying		Lands on loch
10/07/2018	Red-throated diver	2	Flying		Fly over loch
10/07/2018	Red-throated diver	0		Used nest (this yr)	Nest predated/trampled. Eggs in fragments. Fisherman? Deer?
10/07/2018	Red-throated diver	0		Used nest (this yr)	Relay attempt? No evidence of eggs
10/07/2018	Red-throated diver	0		Used nest (this yr)	Nest predated. Eggshell in water. Shoreline search
10/07/2018	Red-throated diver	1			
15/08/2018	Red-throated diver	2	Roost		no fledged young
15/08/2018	Red-throated diver				nil result
15/08/2018	Red-throated diver				nil result for RH T.x5, LGx2
29/08/2018	Red-throated diver				nil result
29/08/2018	Red-throated diver				nil result
29/08/2018	Red-throated diver				nil result
29/08/2018	Red-throated diver				nil result Bog bean cover >50%
30/08/2018	Red-throated diver				nil result, no other wildfowl
30/08/2018	Red-throated diver				nil result
30/08/2018	Red-throated diver				nil result
30/08/2018	Red-throated diver				nil result
30/08/2018	Red-throated diver				nil result. Bogbean >50%
30/08/2018	Red-throated diver				nil result
24/04/2019	Red-throated diver	3			
24/04/2019	Red-throated diver	4			
26/04/2019	Red-throated diver	2			
26/04/2019	Red-throated diver	2	Roost		
28/04/2019	Red-throated diver	2			
28/04/2019	Red-throated diver	4			
28/04/2019	Red-throated diver	2			
29/04/2019	Red-throated diver	2	Roost		
29/04/2019	Red-throated diver	3			
29/04/2019	Red-throated diver	2			
30/04/2019	Red-throated diver	2			
30/04/2019	Red-throated diver	2			
13/05/2019	Red-throated diver	2	Roost		Still present at 1230
13/05/2019	Red-throated diver	2	Roost		Still present at 1215
13/05/2019	Red-throated diver	2			On loch
14/05/2019	Red-throated diver	2			On loch
14/05/2019	Red-throated diver	2	Incubate	Nest	Possible nest on N side
29/05/2019	Red-throated diver	1			Loafing
29/05/2019	Red-throated diver	2			Loafing
29/05/2019	Red-throated diver	2	Territorial, Display		Nest prospecting
30/05/2019	Red-throated diver	2	Display, Territorial		Nest prospecting
30/05/2019	Red-throated diver	1			Loafing
30/05/2019	Red-throated diver	2			Loafing/Sleeping
07/06/2019	Red-throated diver	2	Loafing		
07/06/2019	Red-throated diver	1	Hunt/feed		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
11/06/2019	Red-throated diver	2	Display		
11/06/2019	Red-throated diver	1	Roost		
12/06/2019	Red-throated diver	0		No signs	
12/06/2019	Red-throated diver	0		No signs	
13/06/2019	Red-throated diver	0		No signs	
13/06/2019	Red-throated diver	0		No signs	
13/06/2019	Red-throated diver	0		No signs	
19/06/2019	Red-throated diver	0		Nest failed	Moved by water
20/06/2019	Red-throated diver	1	Flying, Vocalise		
04/07/2019	Red-throated diver	0		No signs	
04/07/2019	Red-throated diver	2	Territorial, Incubate		
04/07/2019	Red-throated diver	2	Territorial, Not breeding		
04/07/2019	Red-throated diver			No signs	
04/07/2019	Red-throated diver	1	Territorial, Incubate		
04/07/2019	Red-throated diver	0		No signs	
13/07/2019	Red-throated diver	0		No signs	
13/07/2019	Red-throated diver	2	Roost		No evidence of juveniles
14/07/2019	Red-throated diver	2	Roost, Flying		At 0610 flew over small lochan towards Lochan Fraoich
14/07/2019	Red-throated diver	2	Flying		flew towards Lochan A' Chreimh
14/07/2019	Red-throated diver	2	Flying		flew west
14/07/2019	Red-throated diver	2	Roost		Probably same pair as at 0600 (In smaller lochan)
14/07/2019	Red-throated diver	0		No signs	
06/08/2019	Red-throated diver	3	Roost		Flew off at 0645 50-100m
06/08/2019	Red-throated diver	3	Roost		
06/08/2019	Red-throated diver	1	Roost		Probably one of the birds seen earlier
08/08/2019	Red-throated diver	2	Roost		
08/08/2019	Red-throated diver	2	Roost		
08/08/2019	Red-throated diver	2	Roost		In the small lochan
08/08/2019	Red-throated diver	2	Roost		
12/07/2019	Red-throated diver	2	Vocalise		
12/07/2019	Red-throated diver	2	Flying		
12/07/2019	Red-throated diver	2	Roost		On small lochan prob same pair as 0655 & 0745
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
24/04/2014	See comments			No signs	RH/BV survey. No divers
17/04/2014	See comments			No signs	BV/RH survey. No divers Watch scan from VP.
07/04/2014	See comments			No signs	RH/BV survey. No divers
09/05/2014	See comments			No signs	RH/BV survey. No divers
13/05/2014	See comments			No signs	RH/BV survey. No divers
14/05/2014	See comments			No signs	RH/BV survey. No divers
20/05/2014	See comments			No signs	RH/BV survey. No divers
20/05/2014	See comments			No signs	RH/BV survey. No divers

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
21/05/2014	See comments			No signs	RH/BV survey. No divers
27/05/2014	See comments			No signs	RH/BV survey. No divers
27/05/2014	See comments			No signs	RH/BV survey. No divers
09/06/2014	See comments			No signs	RH/BV survey. No divers
11/06/2014	See comments			No signs	RH/BV survey. No divers
11/06/2014	See comments			No signs	RH/BV survey. No divers. Small Lochan.
11/06/2014	See comments			No signs	RH/BV survey. No divers
15/06/2014	See comments			No signs	RH/BV survey. No divers
15/06/2014	See comments			No signs	RH/BV survey. No divers. Small lochan
15/06/2014	See comments			No signs	RH/BV survey. No divers. Large lochan
15/06/2014	See comments			No signs	
17/06/2014	See comments			No signs	RH/BV survey. No divers
17/06/2014	See comments			No signs	RH/BV survey. No divers
17/06/2014	See comments			No signs	RH/BV survey. No divers
17/06/2014	See comments			No signs	RH/BV survey. No divers
17/06/2014	See comments			No signs	RH/BV survey. No divers
17/06/2014	See comments			No signs	EA/HH Observations (1230-1500hrs) from Creag Mhor.
17/06/2014	See comments			No signs	RH/BV survey. No divers
18/06/2014	See comments			No signs	RH/BV survey. No divers
19/06/2014	See comments			No signs	RH/BV survey. No divers
19/06/2014	See comments			No signs	RH/BV survey. No divers
19/06/2014	See comments			No signs	RH/BV survey. No divers
20/06/2014	See comments			No signs	RH/BV survey. No divers
23/06/2014	See comments			No signs	RH/BV survey. No divers
11/07/2014	See comments			No signs	RH/BV survey. No divers
28/07/2014	See comments			No signs	RH/BV survey. No divers
04/08/2014	See comments			No signs	RH/BV survey. No divers
04/08/2014	See comments			No signs	RH/BV survey. No divers
21/04/2015	See comments			No signs	HH ML search
29/05/2015	See comments	0		No signs	RH/BV survey. No divers h
09/05/2018	See comments	1	Flying		Possible black-throated diver
23/06/2015	Short-eared owl	0		No signs	Nil result
06/08/2015	Short-eared owl	1	Flying		Flying from perch
04/06/2018	Sparrowhawk	1	Hunt/feed		
08/06/2018	Sparrowhawk	1	Flying,Hunt/feed		
27/05/2016	Teal	3			On loch
09/05/2018	Teal	2			
09/05/2018	Teal	2	Incubate	Nest	
05/06/2018	Teal	1			
05/06/2018	Teal	1			
25/04/2019	Teal	2			On small pool
28/04/2019	Teal	2			
29/04/2019	Teal	2	Roost		
29/04/2019	Teal	1			
30/04/2019	Teal	2			
30/04/2019	Teal	2			
14/05/2019	Teal	1			On loch
12/06/2019	Teal	1	Chick tend		2 chicks
13/06/2019	Teal	1	Agitated/alarm		

Table 10. Scarce Breeding Bird survey results, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Comments
02/04/2018	Woodcock	1	Flying		Flushed from restock
11/06/2019				No signs	No divers
11/06/2019				No signs	No divers

Table 11. Moorland Breeding Bird survey results, 2014-2016.				
Date	Species	No.	Behaviour	Comments
28/04/2014	Curlew	2	Vocalise, Flying	Flew off over forest.
16/04/2014	Greenland white-fronted goose	6	Flying	
08/04/2014	White-tailed eagle	1	Flying	Observed flying towards West Loch Tarbert.
20/05/2014	Black grouse	1	Flying	Flushed - flew from moor to forest.
21/04/2015	Golden eagle	1		Flushed with full crop
21/04/2015	Short-eared owl	1	Territorial	Flushed
22/04/2015	Red-throated diver	2		50-100m in flight
23/04/2015	Curlew	1	Territorial	
23/04/2015	Black grouse	1		<10m
16/05/2015	Curlew	1	Display	Off Site
10/06/2015	Hen harrier	1	Hunt/feed	
27/06/2015	Curlew	2	Flying	Flying E to W (50-100m)
08/07/2015	Red-throated diver	2	Territorial	
08/07/2015	Hen harrier	1	Hunt/feed	Hunting and interacting
08/07/2015	Hen harrier	1	Hunt/feed	Hunting and interacting
20/05/2016	Red-throated diver	2	Territorial	On loch
20/05/2016	Red-throated diver	2	Flying	
20/05/2016	Curlew	1	Display	
30/05/2016	Short-eared owl	1	Hunt/feed	
30/05/2016	Red-throated diver	2		On loch
09/06/2016	Red-throated diver	1		

Table 12. Winter walked transect results, 2014 -2018.					
Date	Species	No.	Behaviour	Signs	Additional Information
27/01/2014	Greenland white-fronted goose			No signs	
27/01/2014	Greenland white-fronted goose			No signs	
27/01/2014	Greenland white-fronted goose			No signs	Walked entire shoreline but no evidence of roosting NW - Water levels very high.
27/01/2014	Crossbill	3	Flying		Lochan Eilein Beag.
20/01/2014	Greenland white-fronted goose			No signs	To check for signs of roosting NW - no signs.
20/01/2014	Greenland white-fronted goose			Faeces	To check for signs of roosting NW - no signs. A few fresh droppings.
15/01/2014	Greenland white-fronted goose	104	Hunt/feed		Single flock
15/01/2014	Hen harrier	1	Hunt/feed		Ringtail.
08/01/2014	Mallard	3	Flying		Flew off.
08/01/2014	Teal	3	Flying		Flew off.
08/01/2014	Greenland white-fronted goose			Feathers, Faeces	Fresh signs of NW on
07/01/2014	Peregrine	1	Flying		Flushed and landed.
07/01/2014	Hen harrier	1	Flying		Ringtail.
07/01/2014	Greenland white-fronted goose			No signs	Drove along track VP2 to VP8 (car park). Then checked fields at Clachan for NW. None seen.
27/02/2014	Mallard	9	Roost		
27/02/2014	Herring gull	40	Roost		
27/02/2014	Teal	15	Roost		
27/02/2014	Snipe	2	Flying		
27/02/2014	Greenland white-fronted goose			Feathers	Single feather (NW). No evidence of roosting.
27/02/2014	Kestrel	1	Flying		
27/02/2014	Red grouse	2	Flying		
27/02/2014	Red grouse	2	Flying		
27/02/2014	Snipe	1	Flying		
20/02/2014	Greenland white-fronted goose	150	Hunt/feed		
20/02/2014	Greenland white-fronted goose	8	Hunt/feed		
17/02/2014	Greenland white-fronted goose			Faeces	Several piles of old droppings.
17/02/2014	Mallard		Roost		
17/02/2014	Teal		Roost		
17/02/2014	Crossbill		Sing		
17/02/2014	Greenland white-fronted goose			No signs	
17/02/2014	Greenland white-fronted goose			No signs	
17/02/2014	Greenland white-fronted goose			No signs	
17/02/2014	Teal	20	Roost		

Table 12. Winter walked transect results, 2014 -2018.					
Date	Species	No.	Behaviour	Signs	Additional Information
17/02/2014	Greenland white-fronted goose			Feathers	
13/02/2014	Greenland white-fronted goose			No signs	
13/02/2014	Mallard	2	Roost		
13/02/2014	Greenland white-fronted goose			No signs	
13/02/2014	Goldeneye	1	Roost		
10/02/2014	Greenland white-fronted goose	56	Flying		Two flocks flew W to E across main road and landed in field (30-50m)
10/02/2014	Greenland white-fronted goose	34	Flying		Two flocks flew W to E across main road and landed in field (30-50m)
06/02/2014	Greenland white-fronted goose	163	Hunt/feed		Goose count Clachan fields.
25/03/2014	Greenland white-fronted goose	160	Hunt/feed, Flying		Short flight from field to Loch nan Gad
25/03/2014	Teal	4	Hunt/feed		
25/03/2014	Mallard	4	Hunt/feed		
25/03/2014	Lapwing	12	Roost		
25/03/2014	Buzzard	1	Roost		
25/03/2014	Buzzard	2	Flying		
25/03/2014	Buzzard	2	Flying		
25/03/2014	Buzzard	1	Flying		
16/10/2014	Hen harrier	1	Flying		To roost? 10-30m
16/10/2014	See comments			No signs	VP over Loch Ciaran 0.5hr
16/10/2014	Greenland white-fronted goose			No signs	No NW seen.
23/10/2014	Sparrowhawk	1	Hunt/feed	No signs	
23/10/2014	Song thrush	1	Hunt/feed	No signs	
23/10/2014	Kestrel	1	Flying	No signs	
23/10/2014	Crossbill	3	Flying	No signs	
23/10/2014	Raven	2	Flying	No signs	
23/10/2014	Kestrel	1	Hunt/feed	No signs	
19/11/2014	Greenland white-fronted goose	37	Hunt/feed		
19/11/2014	Greenland white-fronted goose	9	Flying		Join 37 NW at Achavallich
19/11/2014	Greenland white-fronted goose	22	Hunt/feed		Moving over skyline
19/11/2014	Greenland white-fronted goose	155	Hunt/feed		
20/11/2014	Greenland white-fronted goose			No signs	
20/11/2014	Greenland white-fronted goose			No signs	
12/11/2014	Greenland white-fronted goose			No signs	
12/11/2014	Greenland white-fronted goose			No signs	
12/11/2014	Greenland white-fronted goose			Feathers	Minimal use by geese

Table 12. Winter walked transect results, 2014 -2018.					
Date	Species	No.	Behaviour	Signs	Additional Information
12/11/2014	Greenland white-fronted goose			Feathers	Minimal use by geese
12/11/2014	Greenland white-fronted goose			No signs	
12/11/2014	Greenland white-fronted goose			No signs	
11/12/2014	Greenland white-fronted goose			No signs	
11/12/2014	Greenland white-fronted goose			No signs	
12/12/2014	Raven	1			
12/12/2014	Mallard	25			
12/12/2014	Teal	8			
12/12/2014	Greenland white-fronted goose			No signs	
12/12/2014	Snipe	1			
17/12/2014	Greenland white-fronted goose			No signs	Looking for feeding NW
17/12/2014	Greenland white-fronted goose			No signs	
17/12/2014	Mallard	3	Hunt/feed		
17/12/2014	Greenland white-fronted goose			No signs	
17/12/2014	Greenland white-fronted goose			No signs	
17/12/2014	Buzzard	1	Flying		
17/12/2014	Greenland white-fronted goose			No signs	
30/12/2014	Greenland white-fronted goose			No signs	None on Clachan feeding fields
21/01/2015	Golden eagle			Kill/prey, Faeces	Old kill, Fresh faeces
21/01/2015	Raven	2	Hunt/feed		
04/02/2015	Hen harrier	1	Hunt/feed		
04/02/2015	Crossbill	1	Sing		Off Site
04/02/2015	Greenland white-fronted goose			No signs	
04/02/2015	Greenland white-fronted goose			No signs	
04/02/2015	Barn owl			Faeces, Feathers, Pellets	Plenty fresh signs
04/02/2015	Greenland white-fronted goose			Faeces, Feathers	1000+ fresh droppings on ice
04/02/2015	Greenland white-fronted goose	100	Hunt/feed		
04/02/2015	Snipe	1			
04/02/2015	Crossbill	4			5 dead sheep around Scotmill
17/02/2015	Red grouse	2			
17/03/2015	Golden plover	200	Roost		
17/03/2015	Raven	4	Territorial		
17/03/2015	Greenland white-fronted goose			No signs	

Table 12. Winter walked transect results, 2014 -2018.					
Date	Species	No.	Behaviour	Signs	Additional Information
17/03/2015	Greenland white-fronted goose			No signs	
17/03/2015	Black grouse	1	Hunt/feed		
17/03/2015	Greenland white-fronted goose			No signs	
19/03/2015	Song thrush	1	Sing		
19/03/2015	Song thrush	1	Sing		
19/03/2015	Black grouse	1	Display		Lek
19/03/2015	Red-throated diver	1	Territorial		
19/03/2015	Black grouse	3			Flushed
19/03/2015	Red grouse	2	Territorial		
19/03/2015	Hen harrier	1	Flying		Soaring 10-100
19/03/2015	Hen harrier	1	Territorial		
10/09/2015	Kestrel	1	Hunt/feed		
10/09/2015	Raven	1			
10/09/2015	Kestrel	1	Hunt/feed		
14/10/2015	Teal	2			
14/10/2015	Greenland white-fronted goose	0		No signs	
14/10/2015	Greenland white-fronted goose	0		No signs	
15/10/2015	Greenland white-fronted goose	17	Hunt/feed		
15/10/2015	Greenland white-fronted goose	0			NW search around Clachan = Nil Result
11/11/2015	Black grouse	2	Flying		30-50 in flight
16/11/2015	Greenland white-fronted goose	14	Hunt/feed		
16/11/2015	Greenland white-fronted goose	100	Hunt/feed		
24/11/2015	Hen harrier	1	Hunt/feed		10-30m
19/11/2015	Black grouse	1	Flying		In flight old forestry
08/12/2015	Greenland white-fronted goose	110	Hunt/feed		Drive around Clachan to scan fields
08/12/2015	Greenland white-fronted goose	0		Feathers, Faeces	Signs of foraging on sedge & bog bean
09/12/2015	Mallard	3			
09/12/2015	Snipe	1			
09/12/2015	Red grouse	2			
09/12/2015	Black grouse	1	Flying		<10-50m
09/12/2015	Sparrowhawk	1			
09/12/2015	Raven	1			
09/12/2015	Greenland white-fronted goose	0		No signs	Area searched for NW signs
09/12/2015	Greenland white-fronted goose	0		No signs	Wet area with sparse Bog bean, very little open water
10/12/2015	Woodcock	1	Hunt/feed		Flushed <10m
10/12/2015	Woodcock	1	Hunt/feed		Flushed <10m
10/12/2015	Black grouse	1	Flying		10-50m
10/12/2015	Greenland white-fronted goose	0		Feathers, Faeces	Plenty signs of NW

Table 12. Winter walked transect results, 2014 -2018.

Date	Species	No.	Behaviour	Signs	Additional Information
10/12/2015	Red grouse	2			Flushed <10m
10/12/2015	Jack snipe	1			Flushed <10m
19/01/2016	Greenland white-fronted goose	0		No signs	90% cover of ice
19/01/2016	Greenland white-fronted goose	0		No signs	50% ice. Foraging by NW inconclusive
19/01/2016	Greenland white-fronted goose	0		No signs	Signs of foraging inconclusive
14/01/2016	Reed bunting	1			
14/01/2016	Snipe	1			
14/01/2016	Black grouse	4	Flying		<10 - 10-30m
14/01/2016	Duncock	1			
04/02/2016	Snipe	1			Flushed
04/02/2016	Golden plover	50	Roost	Faeces, Feathers	Flushed from roost. Exact roost area used by 600+ birds as seen at VP11 03/02/16
04/02/2016	Golden plover	4	Roost		
04/02/2016	Greenland white-fronted goose	0		No signs	
04/02/2016	Golden plover	0		Feathers	
04/02/2016	Greenland white-fronted goose	0		Feathers	More fresh feathers since last visit
10/02/2016	Red grouse	1			Flushed
10/02/2016	Red grouse	1			Flushed
10/02/2016	Red grouse	1	Territorial		
10/02/2016	Red grouse	1	Territorial		
10/02/2016	Red grouse	1	Territorial		
10/02/2016	Red grouse	1	Territorial		
10/02/2016	Black grouse	1	Territorial		Flushed
10/02/2016	Greenland white-fronted goose	2			50-100 to land
10/02/2016	Greenland white-fronted goose	40	Hunt/feed		
17/03/2016	Lapwing	1	Display		
17/03/2016	Snipe	1	Display		
17/03/2016	Black grouse	1			Flushed from Lek
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Black grouse	1	Display		
17/03/2016	Black grouse	1	Display		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red grouse	1	Territorial		
17/03/2016	Red-throated diver	2	Display		Wailing from 0630
17/03/2016	Duncock	1	Sing		

Table 12. Winter walked transect results, 2014 -2018.					
Date	Species	No.	Behaviour	Signs	Additional Information
17/03/2016	Song thrush	1	Sing		
17/03/2016	Black grouse	1	Flying		10-30m
17/03/2016	Greenland white-fronted goose	100	Hunt/feed		
29/11/2016	Greenland white-fronted goose	0		No signs	No geese just 2 dead sheep
29/11/2016	Greenland white-fronted goose	0		Feathers	Lots of grey geese feathers around loch
30/11/2016	Greenland white-fronted goose	0		Feathers	Lots of small feathers around edge of lochan
27/01/2017	Golden plover	5	Hunt/feed		
29/01/2017	Greenland white-fronted goose	200	Hunt/feed		
29/01/2017	Black grouse	3	Hunt/feed		
29/01/2017	Whooper swan	2	Hunt/feed		
30/01/2018	Greenland white-fronted goose	0		Feathers	Old no fresh signs
30/01/2018	Hen harrier	1	Hunt/feed		<10m
30/01/2018	Greenland white-fronted goose	0		Feathers, Faeces	Very recent use + Fox signs
30/01/2018	Hen harrier	1	Hunt/feed		<10m same bird as 13:18
30/01/2018	Hen harrier	1	Hunt/feed		<10m
30/01/2018	Greenland white-fronted goose	0		Feathers, Faeces	Lots of bog bean pulled up
21/02/2018	Peregrine	1	Flying, Hunt/feed		10-30m then away @ 30-50m
21/02/2018	Hen harrier	1	Flying		10-30m then <10m
21/02/2018	Red grouse	3	Flying		Flushed
21/02/2018	Hen harrier	1	Flying		<10m
21/02/2018	Teal	1	Hunt/feed		
21/02/2018	Red grouse	1	Flying		Southside of lochan
21/02/2018	Golden plover	140	Flying		Landed on fenced off trampled area
21/02/2018	Greenland white-fronted goose	0		Feathers	Eastside of loch lots of feathers
21/02/2018	Lapwing	1			On one of the islands
12/03/2018	Greenland white-fronted goose	147	Hunt/feed		

Table 13. Black grouse lek survey results, 2014 – 2016.					
Date	Species	No.	Behaviour	Signs	Additional Information
29/04/2014	Black grouse	1	Vocalise, Display		Heard sporadically (not seen)- in vicinity of previous years location(outside 2km buff).
28/04/2014	Black grouse	3	Display	Lek site	New lek-2 males actively displaying 0500-0645-Grey hen observed on lek at 0630-0645
28/04/2014	Black grouse	1	Vocalise		Single male heard sporadically close to male displaying located on 15/04/14.
15/04/2014	Black grouse	1	Vocalise, Display		Heard sporadically NW and SW of Loch Lurach-possibly same bird fl;ying around.
15/04/2014	Black grouse	1	Display	Lek site	Single male flying and landing/displaying.
15/04/2014	Black grouse	1	Display	Lek site	Single male lekking (different to above).
15/04/2014	Black grouse	1	Hunt/feed		
07/04/2014	Black grouse			No signs	Checked led - none present (and surrounding area).
02/04/2014	Black grouse			No signs	None present (4 males here displaying on 23/03/2014) - Excavator on site for borrow pit.
08/05/2014	Black grouse	1	Display, Vocalise	Lek site	Heard displaying (poor visibility) - also lekking here last year. NR 80400 56600)
12/05/2014	Black grouse	1	Flying		Flushed near track.
12/05/2014	Black grouse	3	Display	Lek site	1male and 2 female on lek site.
12/05/2014	Black grouse	1	Hunt/feed		1 female close to lek feeding.
14/05/2014	Black grouse	1	Flying		Flushed edge of track.
14/05/2014	Black grouse	1	Display	Lek site	Flew off a short distance and still displaying.
14/05/2014	Black grouse	1	Flying		Flushed edge of track.
22/04/2015	Black grouse	1	Display		
22/04/2015	Black grouse	1	Display		
22/04/2015	Black grouse	1	Display		Heard only
22/04/2015	Black grouse	1	Display		
23/04/2015	Black grouse	1	Display		
23/04/2015	Black grouse	1	Display		Heard only
23/04/2015	Black grouse	1	Display		Heard only
23/04/2015	Black grouse	1	Display		Heard only
23/04/2015	Black grouse	1	Display		Heard only, Seen here 22/04/15
24/04/2015	Black grouse	1	Display		Likely flushed by a surveyor
24/04/2015	Black grouse	1	Display		
13/05/2015	Black grouse	1	Display		
13/05/2015	Black grouse	3			
13/05/2015	Black grouse	1	Display		
13/05/2015	Black grouse	1	Display		
13/05/2015	Black grouse	1			<10m
13/05/2015	Black grouse	1	Display		
13/05/2015	Black grouse	1			
13/05/2015	Black grouse	1			
14/05/2015	Black grouse	1	Display		<10m
14/05/2015	Black grouse	1	Display		<10m

Table 13. Black grouse lek survey results, 2014 – 2016.

Date	Species	No.	Behaviour	Signs	Additional Information
14/05/2015	Black grouse	2	Display		<10m
19/04/2016	Black grouse	1			Flushed
13/04/2016	Black grouse	1	Display		Possibly 2 birds - Heard only
27/04/2016	Black grouse	1	Display		Single male moving around prob same bird as seen in same area on 26/4 Flew off at 0540 (not seen)
26/04/2016	Black grouse	4	Display	Lek site	1 male flew off c0530 - not seen
26/04/2016	Black grouse	1	Display		Prob male which flew off above
26/04/2016	Black grouse	1	Display		Possibly same bird as M1.2
26/04/2016	Black grouse	3	Flying		3 males flew off from lek to forest edge
25/04/2016	Black grouse	1	Vocalise, Display		Heard lekking NE of VP11
12/05/2016	Black grouse	3	Display		
05/05/2016	Black grouse	1	Display		
05/05/2016	Black grouse	2	Display		
05/05/2016	Black grouse	2	Display		

Table 14. Incidental records, 2014-2019.

Date	Species	No.	Behaviour	Signs	Additional information
27/02/2014	Greenland white-fronted goose	160	Hunt/feed		Field West of main road.
24/02/2014	Greenland white-fronted goose	150	Hunt/feed		150 NW in field at Clachan.
06/02/2014	Merlin	1	Flying		Flushed. <10m.
04/02/2014	Black grouse	1	Flying		<10m
10/03/2014	Hen harrier	1	Hunt/feed		Made kill.
10/03/2014	Hen harrier	1	Flying		Circled up from <10m to 150m+.
10/03/2014	Hen harrier	1	Flying		10-30m
10/03/2014	Hen harrier	2	Display		50-100m height. Ringtail. Looked smaller than adult Male so may not have been a pair. Circled together.
11/03/2014	Hen harrier	1	Hunt/feed		Hunting <2m, made at least one kill. Frequent periods of sitting on ground.
11/03/2014	Hen harrier	1	Hunt/feed		Same individual as above, same hatched area. <2m.
27/03/2014	Hen harrier	1	Flying		Seen during migration watch.
07/03/2014	Greenland white-fronted goose	160	Hunt/feed		Seen from VP1. No flights after arrival in fields at 0735 (left roost at Lochan Tamalabh at 0730. c.100 so not entire flock roosting there).
06/03/2014	Black grouse	2	Hunt/feed		
02/03/2014	Greenland white-fronted goose	55	Hunt/feed		Two NW flocks in fields. +55 NW possibly roosting near fields?
02/03/2014	Greenland white-fronted goose	105	Hunt/feed		Two NW flocks in fields. Possibly same birds seen flying from roost (Lochan Tamalabh).
29/04/2014	Red-throated diver	2	Roost		
29/04/2014	Red-throated diver	2	Roost		Possibly same pair as at Lochan Fraoich earlier).
29/04/2014	Black grouse	3	Hunt/feed		Feeding (on grit?) on edge of track.
22/04/2014	Red-throated diver	2	Roost		
22/04/2014	Red-throated diver	2	Roost		
21/04/2014	Barn owl	1	Flying		

Table 14. Incidental records, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Additional information
16/04/2014	Hen harrier		Flying		Ringtail.
01/04/2014	Black grouse	1	Display, Hunt/feed		Single cock displaying briefly at 0745. Seen from VP3 (close to last years lek)- still present feeding at 0845-not seen flying off.
05/05/2014	Black grouse	2	Hunt/feed		2 cocks seen briefly from VP not seen arriving or leaving.
06/05/2014	Hen harrier	1	Flying		2 adult males in total
14/05/2014	Barn owl	1	Flying		Flushed from breeding site. Scotmill by another surveyor.
03/06/2014	Red-throated diver	2	Roost		Lochan a' Chreimh (small lochan).
21/06/2014	Hen harrier	1	Flying		Near nest site.
21/06/2014	Hen harrier	1	Flying		
10/07/2014	Hen harrier	1	Flying		Seen while on focal VP (bird from nest).
06/08/2014	Golden eagle	2	Roost		Perched on summit of Cruach nam Fiadh. Different pair to one seen from VP. Flew off to South.
09/09/2014	Red grouse			Recent fledgings	Fledged brood.
16/10/2014	Black grouse	1	Hunt/feed		
28/10/2014	Black grouse	2	Flying		Flushed from track side.
17/11/2014	Black grouse			Faeces	
17/11/2014	Black grouse			Kill/prey	Feather patch -small
17/11/2014	Black grouse			Kill/prey	Feather patch - larger patch
18/11/2014	Black grouse	3	Flying		
18/11/2014	Black grouse			Faeces	
18/11/2014	Black grouse	3	Flying		Flushed
19/11/2014	Raven	12			Raven roost area
08/12/2014	Greenland white-fronted goose	200	Hunt/feed		In fields
11/12/2014	Black grouse	2			
17/12/2014	Hen harrier	1	Hunt/feed		Hunting clearfell
17/12/2014	Hen harrier	1	Hunt/feed		Hunting clearfell briefly mobbed 1st HH
12/01/2015	Black grouse	1	Hunt/feed		Flushed <10
03/02/2015	Greenland white-fronted goose	100	Hunt/feed		Feeding in field
03/02/2015	Greenland white-fronted goose	100	Flying		Flew from feeding field
16/02/2015	Greenland white-fronted goose	100	Hunt/feed		Feeding in field
25/02/2015	Greenland white-fronted goose	100	Hunt/feed		Feeding in field
16/03/2015	Greenland white-fronted goose	50	Hunt/feed		From Focal VP watch
16/03/2015	Greenland white-fronted goose	250	Hunt/feed		From Focal VP watch
17/03/2015	Red-throated diver	1	Vocalise		
17/03/2015	Red-throated diver	1	Vocalise		
20/04/2015	Hen harrier	1	Territorial		Flushed
29/05/2014	Red-throated diver	2	Display		Pair displaying Loch Lurach 0950-1150 throughout focal watch
09/06/2015	White-tailed eagle	1	Flying		Immature bird
10/06/2015	Red-throated diver	2	Territorial		
10/06/2015	Red-throated diver	1	Flying		
25/06/2015	Hen harrier	1	Flying		Flew past east of VP. No map
27/06/2015	Golden eagle	0		No signs	Checked old eyrie- no signs of recent use
27/06/2015	Red-throated diver	0		No signs	Scanned shore of Loch Chaorainn. Pair landed large loch during focal VP

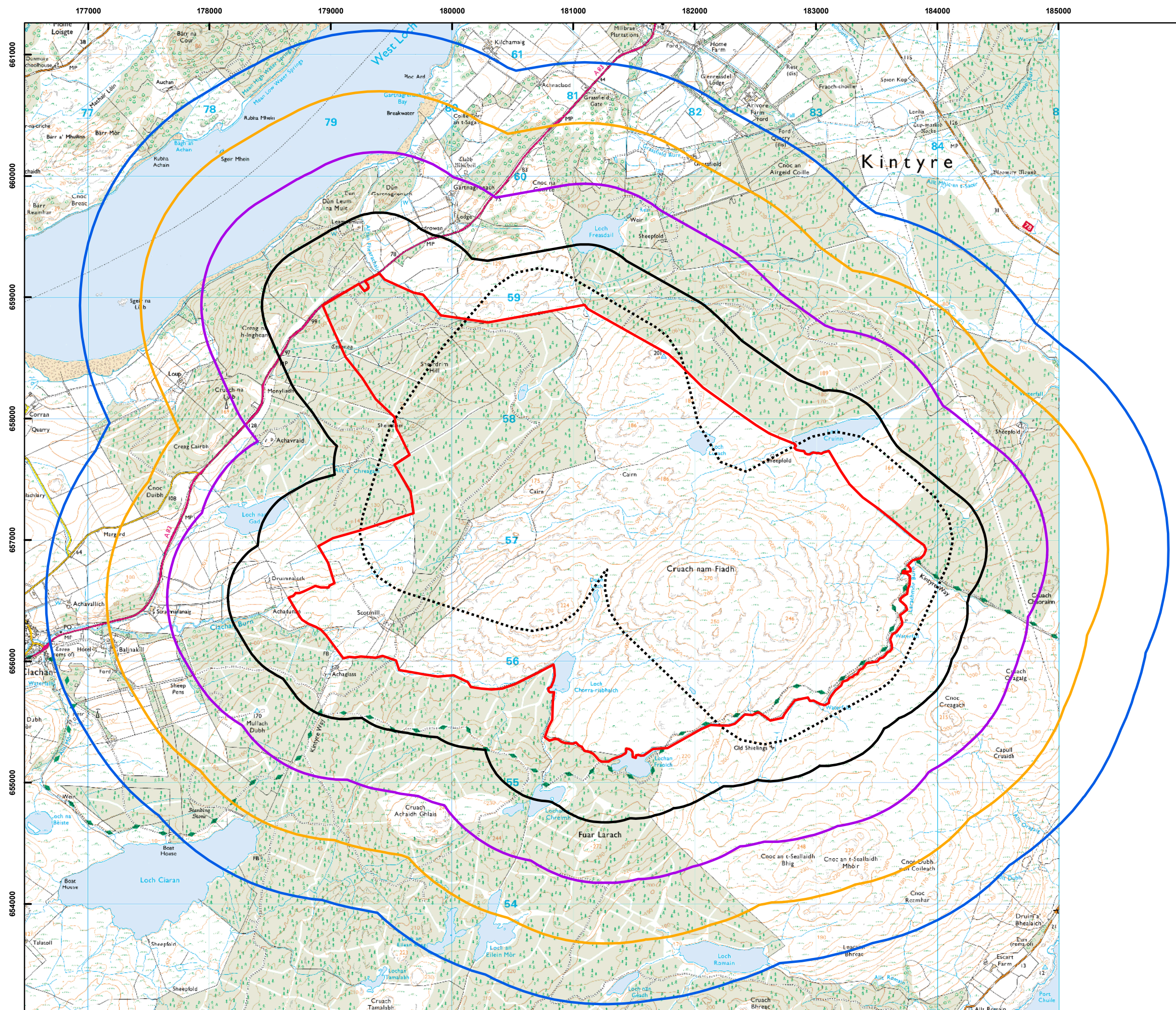
Table 14. Incidental records, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Additional information
07/07/2015	Red-throated diver	2	Display		Plus RH heard only in flight
07/07/2015	Red-throated diver	2	Display		Plus RH heard only in flight
15/12/2015	Whooper swan	20	Hunt/feed		Feeding with 31NW. Recorded during FVP
15/12/2015	Greenland white-fronted goose	31	Hunt/feed		Feeding with 20WS.
12/01/2006	Whooper swan	7			Seen during FVP session
15/01/2016	Whooper swan	9			Seen during FVP session
18/01/2016	Greenland white-fronted goose	140	Hunt/feed		Foraging near Loch nan Gad. Seen during FVP session
02/02/2016	Whooper swan	4	Hunt/feed		On loch throughout watch
03/03/2016	Black grouse	5	Flying		
14/03/2016	Whooper swan	30	Flying		
13/04/2016	Black grouse	1	Flying		
27/04/2016	Black grouse	1	Flying		
25/04/2016	Golden plover	40	Flying		Flock flying W-E towards Gossaig
13/05/2016	Hen harrier	1	Hunt/feed		
17/05/2016	Black-throated diver	2	Hunt/feed		On loch
22/06/2016	Hen harrier	1	Hunt/feed		Very light coloured plumage <10m 28sec
22/06/2016	Hen harrier	1	Hunt/feed		<10m 42sec same bird as at 1301
23/06/2016	Black-throated diver	2			
25/07/2016	Hen harrier	1	Hunt/feed		
28/07/2016	Red-throated diver	2			On loch
28/07/2016	Red-throated diver	2			On loch
04/08/2016	Red-throated diver	1	Flying		Flew from loch ave ht 10-30m
17/08/2016	Black grouse	3			Flushed
13/10/2016	Black grouse	1			Flushed on route to VP9
31/12/2016	Greenland white-fronted goose	120	Hunt/feed		Flock feeding improved grass sheep field
18/11/2016	Greenland white-fronted goose	120	Hunt/feed		In field, possibly disturbed by farmer
16/02/2017	Greenland white-fronted goose	156	Hunt/feed		Present until I left at 0925
16/02/2017	Hen harrier	1	Hunt/feed, Flying		
16/02/2017	Black grouse	1	Flying		Flushed
16/02/2017	Golden plover	160	Flying		Flying until at least 1720
17/02/2017	Greenland white-fronted goose	120	Hunt/feed		
22/02/2017	Black grouse	1	Flying		
22/02/2017	Black grouse	4	Flying		
02/03/2017	Greenland white-fronted goose	145	Hunt/feed		Feeding when arrived at FVP4
02/03/2017	Greenland white-fronted goose	145	Hunt/feed		Moved to new field
02/03/2017	Greylag goose	80	Hunt/feed		Flew in to land near Loch nan Gad
28/11/2017	Greenland white-fronted goose	141	Hunt/feed		Field viewed from FVP
09/01/2018	Greenland white-fronted goose	130	Hunt/feed		Seen during FVP feeding in field
23/01/2018	Hen harrier	1	Flying		Landed twice
24/01/2018	Hen harrier	1	Flying		
13/02/2018	Barn owl	1	Flying,Hunt/feed		

Table 14. Incidental records, 2014-2019.					
Date	Species	No.	Behaviour	Signs	Additional information
21/02/2018	Golden plover	140	Flying		Flushed by predator
21/02/2018	Hen harrier	1	Flying,Hunt/feed, Roost		Heading for roost 10-30m
21/02/2018	Hen harrier	1	Flying,Hunt/feed, Roost		Hunting but on way to roost <10 - 10-30m
21/02/2018	Short-eared owl	1	Flying,Hunt/feed		<10m
21/02/2018	Black grouse	1	Vocalise	Lek site	
06/02/2018	Greenland white-fronted goose	140			Landed in field at end of flight during FVP
13/02/2018	Greenland white-fronted goose	146			Seen in field during FVP
04/05/2018	Hen harrier	1	Flying		
01/06/2018	Red-throated diver	2	Territorial, Hunt/feed		
01/06/2018	Red-throated diver	4	Territorial, Agitated/alarm, Vocalise		Territorial battle
01/04/2019	Red-throated diver	2	Display, Territorial		
01/04/2019	Red-throated diver	1	Territorial, Hunt/feed		
16/04/2019	Black grouse	1	Flying		Flushed from edge of track
17/04/2019	Red-throated diver	2	Roost		On big lochan
17/04/2019	Red-throated diver	2	Roost		On small lochan
17/04/2019	Black grouse	1	Hunt/feed		
17/04/2019	Black grouse	1	Flying		
17/04/2019	Hen harrier	1	Flying,Territorial		
17/04/2019	Lapwing	1	Display		
17/04/2019	Teal	1	Flying,Territorial		
17/04/2019	Mallard	1	Flying,Territorial		
17/04/2019	Cuckoo	1	Flying		
17/04/2019	Black grouse	2	Hunt/feed		On track
29/05/2019	Black grouse	4	Flying		Flushed from track when leaving site
13/07/2019	Black grouse	1	Hunt/feed		Seen from VP9
05/08/2019	Hen harrier	1	Flying		At least 1 fledged. Over top of hill above nest
07/08/2019	Black grouse	2	Flying		Flew across track







Table 15. Species recorded during GVP surveys of flight activity.

Species	No. of 5-minute periods	Encounter rate* (%)
Buzzard	749	7.318
Raven	616	6.019
Hen harrier	180	1.759
Kestrel	113	1.104
Herring gull	109	1.065
Red-throated diver	80	0.782
Golden plover	47	0.459
Golden eagle	50	0.489
Sparrowhawk	31	0.303
Common gull	30	0.293
Cuckoo	30	0.293
Greenland white-fronted goose	28	0.274
Lapwing	24	0.234
Lesser black-backed gull	22	0.215
Curlew	19	0.186
Grey heron	14	0.137
Snipe	11	0.107
Greylag goose	10	0.098
Black grouse	10	0.098
Osprey	9	0.088
Gull sp.	8	0.078
Red grouse	6	0.059
Peregrine	6	0.059
Black-throated diver	4	0.039
Diver sp.	4	0.039
Fieldfare	3	0.029
White-tailed eagle	3	0.029
Short-eared owl	3	0.029
Cormorant	2	0.020
Goshawk	2	0.020
Redwing	2	0.020
Merlin	2	0.020
Redshank	2	0.020
Mallard	2	0.020
Barnacle goose	1	0.010
Goose sp.	1	0.010
Whooper swan	1	0.010
Mute swan	1	0.010
Mistle thrush	1	0.010
Crossbill	1	0.010

*The percentage of 5-min recording periods in which each species was encountered during watches from the GVPs is shown ($852.9 \times 12 = 10,234.8$).



Key

-  Application boundary
-  500m buffer
-  1km buffer
-  1.5km buffer
-  2km buffer
-  Flight activity survey area

Date produced: 24/09/2019
Source: NRP LTD

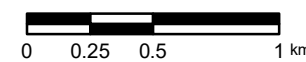
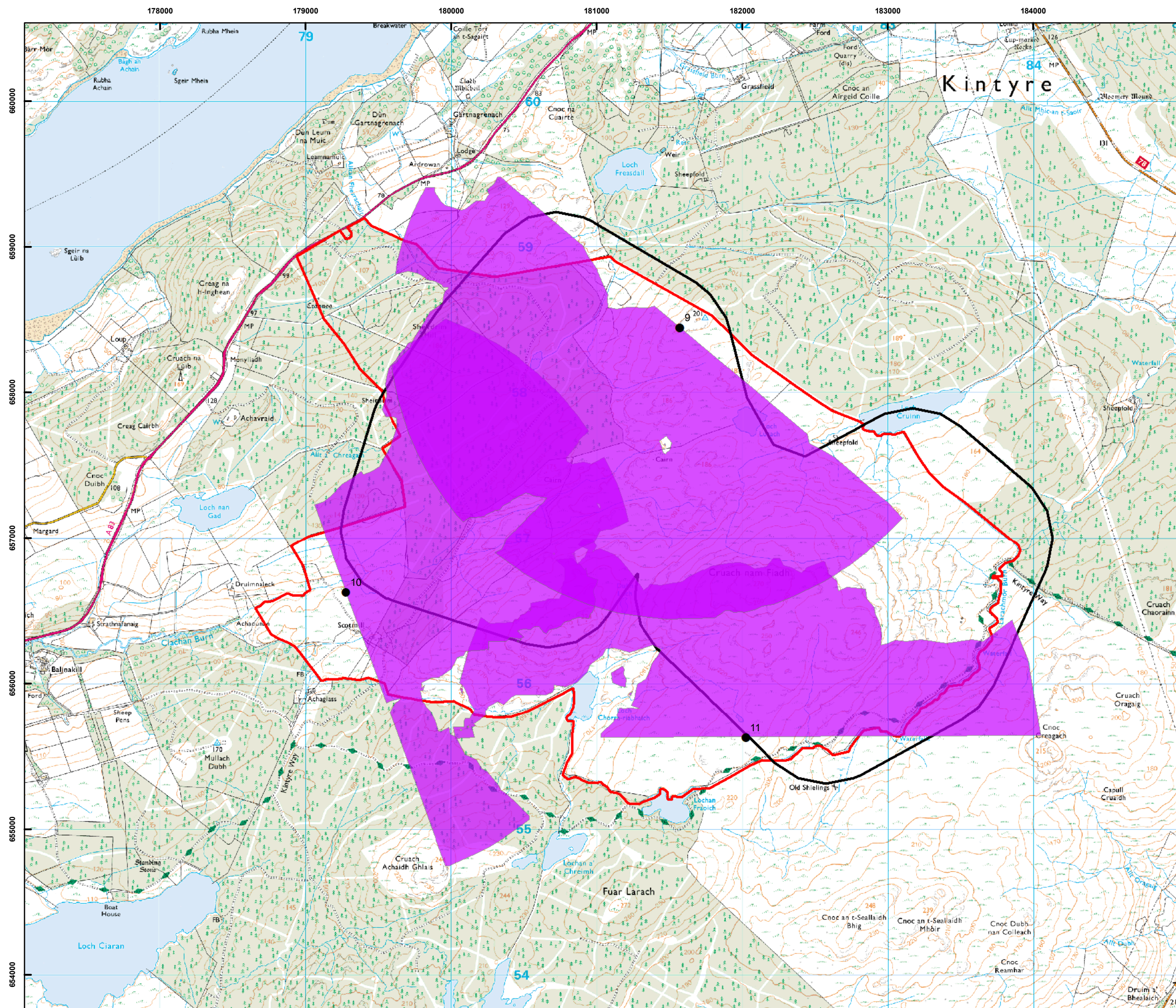


Figure no.1

Survey buffers

Sheirdrim Renewable Energy
Development



Key

- VP location
- Viewshed
- Flight activity survey area
- Application boundary

Date produced: 24/09/2019
Source: NRP LTD

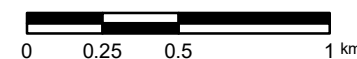
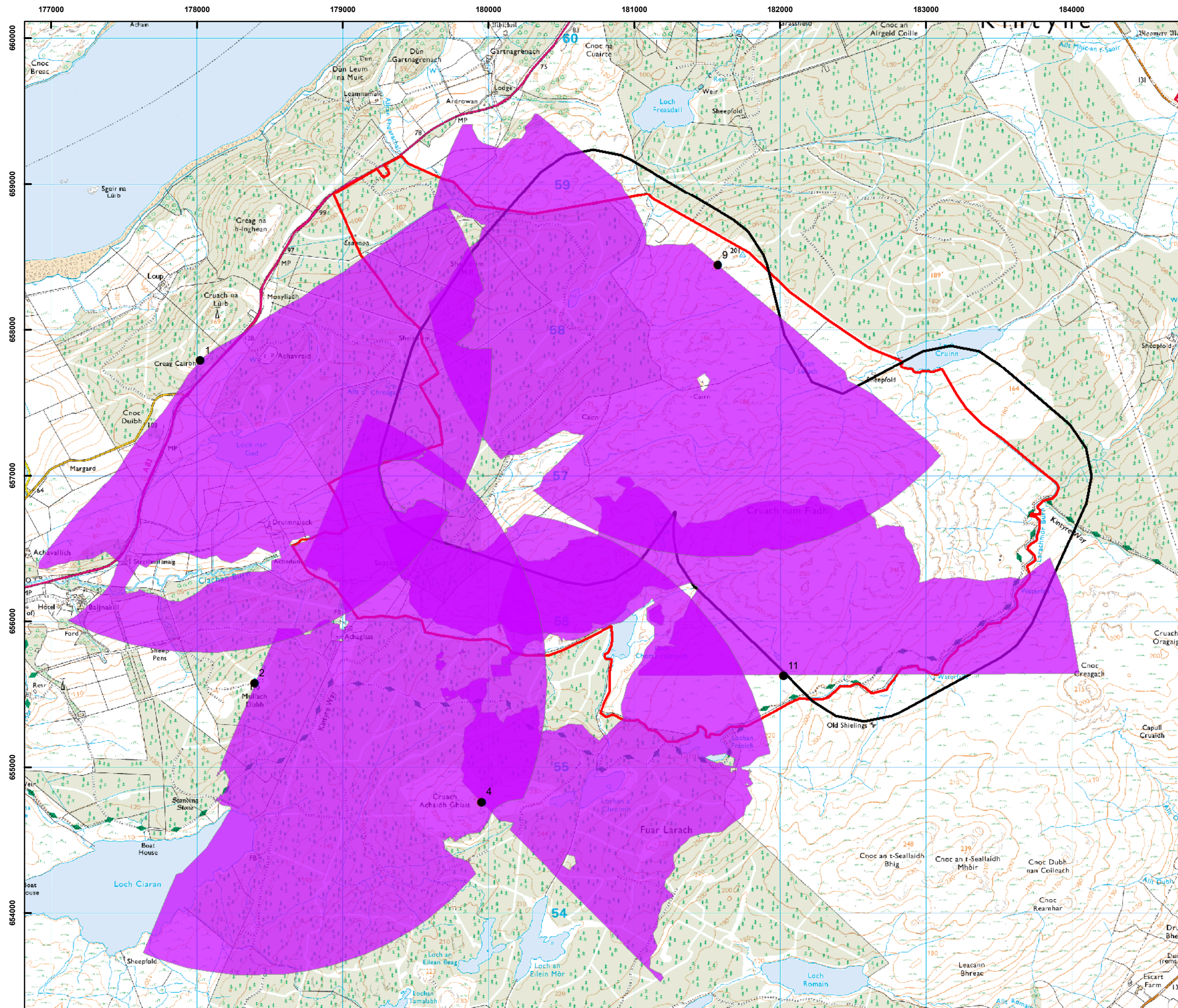


Figure no.2b
**Vantage points and viewsheds
November 2014 to November 2016**

Sheirdrim Renewable Energy
Development



Key

- VP location
- Viewshed
- Flight activity survey area
- Application boundary

Date produced: 24/09/2019
Source: NRP LTD

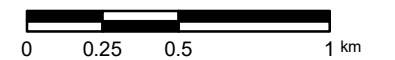
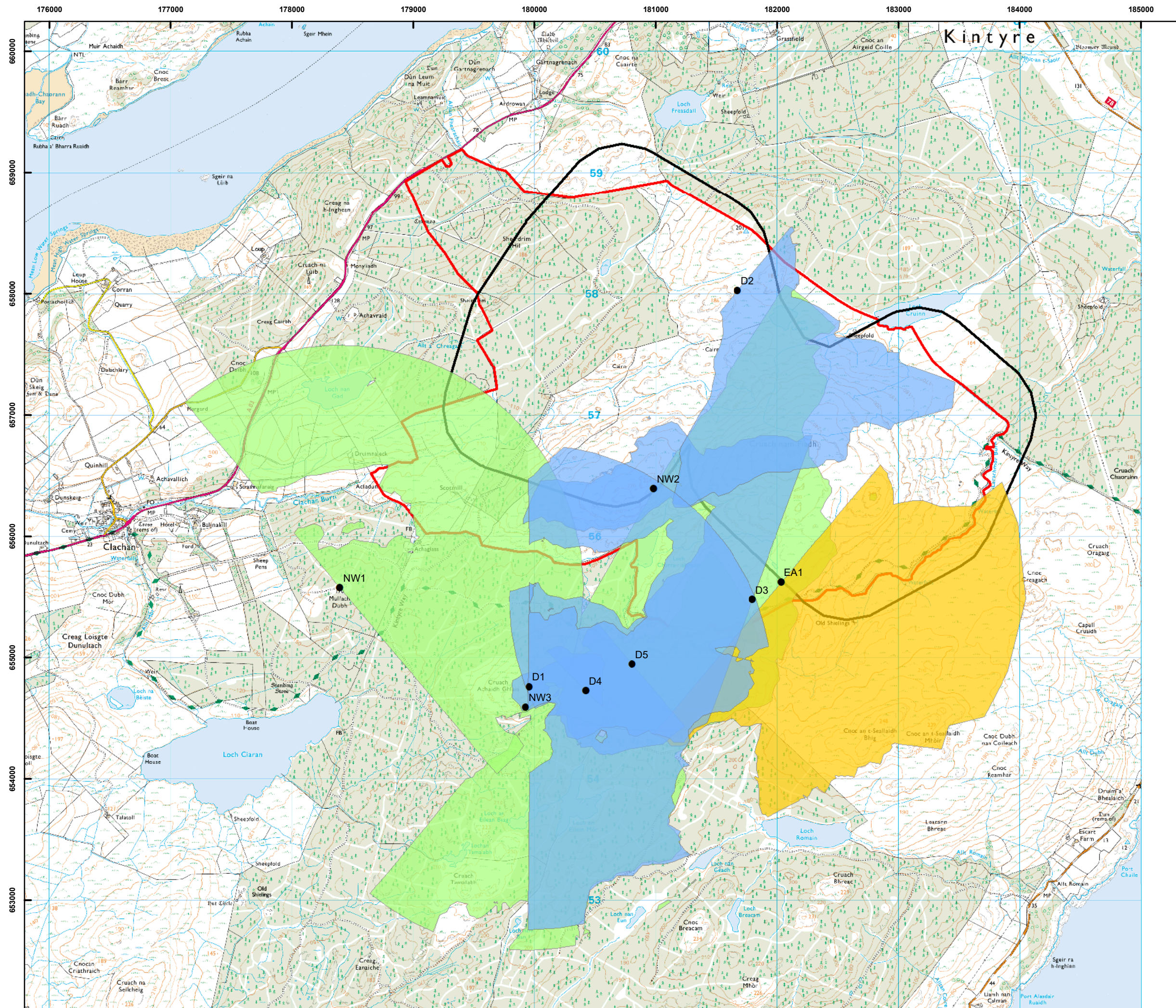


Figure no.2c

**Vantage points and viewsheds
April 2019 to August 2019**

Sheirdrim Renewable Energy
Development



Key

- FVP location
- Diver viewshed
- Eagle viewshed
- White-fronted goose viewshed
- Flight activity survey area
- Application boundary

Date produced: 24/09/2019
Source: NRP LTD

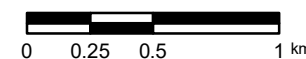
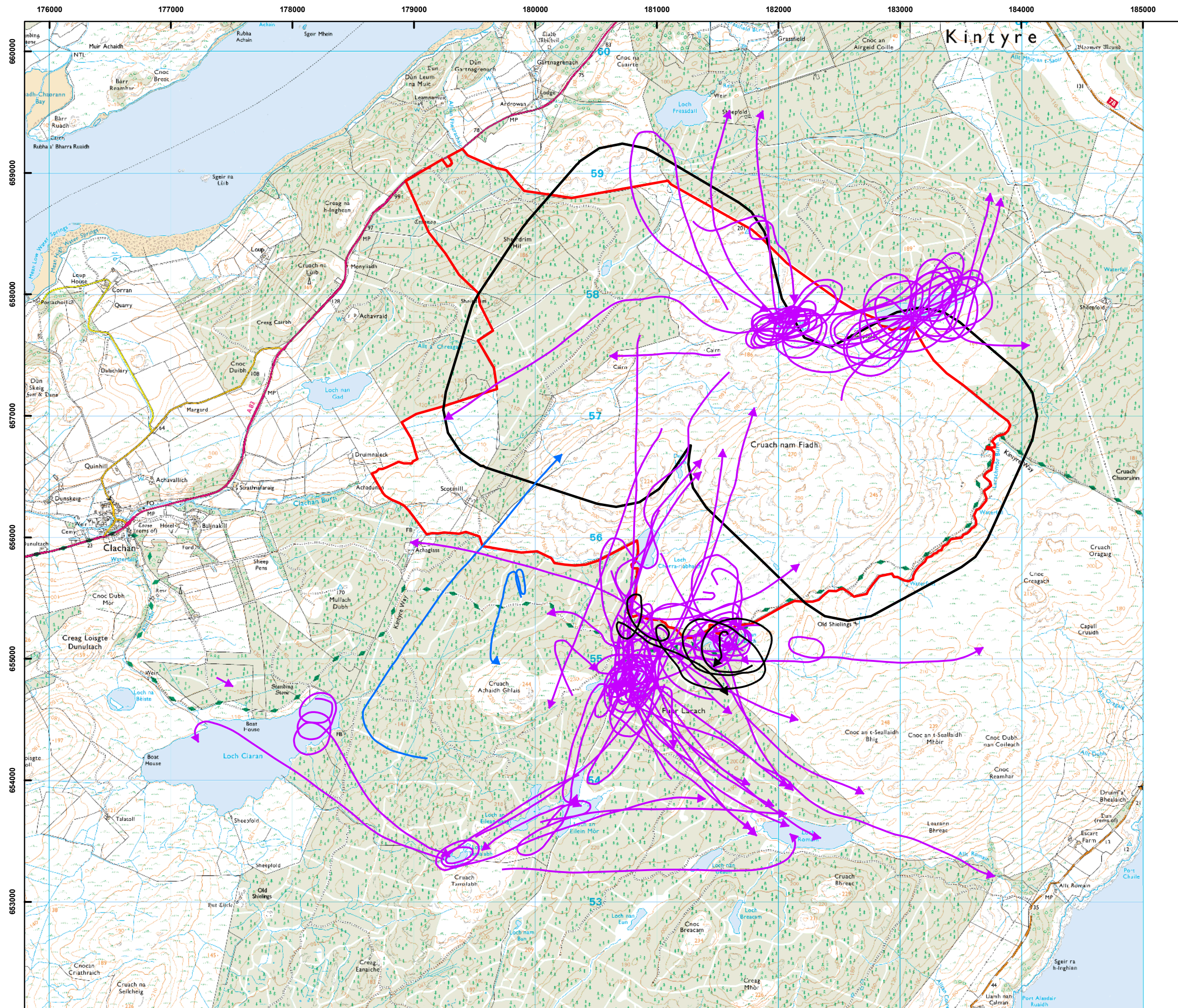







Figure no.2d

Focal vantage Points and viewsheds

Sheirdrim Renewable Energy
Development



Key

-  Black-throated diver
-  Red-throated diver
-  Diver sp.
-  Flight activity survey area
-  Application boundary

Date produced: 24/09/2019
Source: NRP LTD

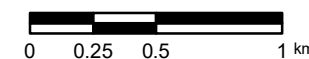
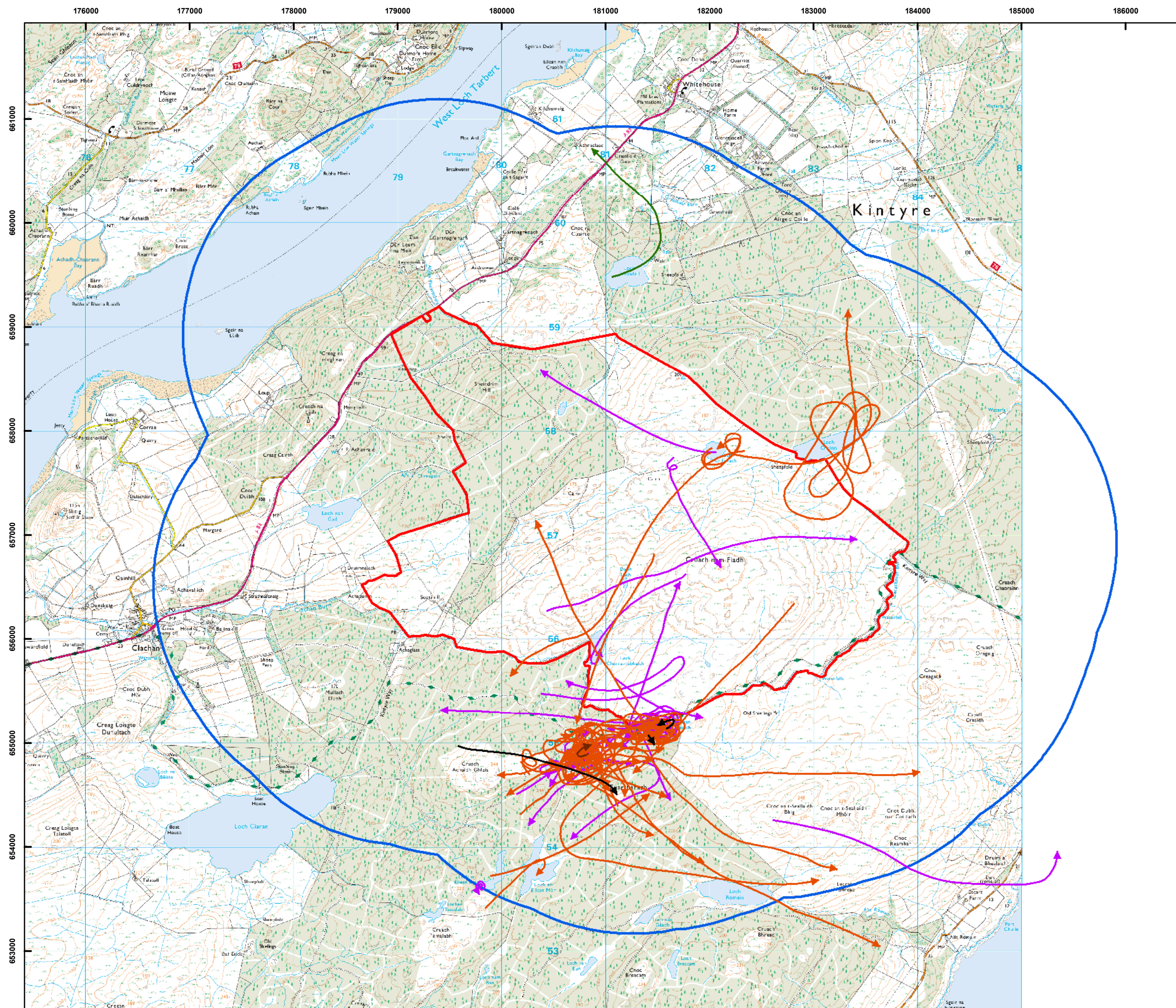


Figure no.3

GVP Diver flight activity

Sheirdrim Renewable Energy
Development



Key

→ Black-throated diver

→ Red-throated diver

Other flight

→ Black-throated diver

→ Red-throated diver

→ Diver sp.

Other flight area

Red-throated diver

2km buffer

Application boundary

Date produced: 24/09/2019

Source: NRP LTD

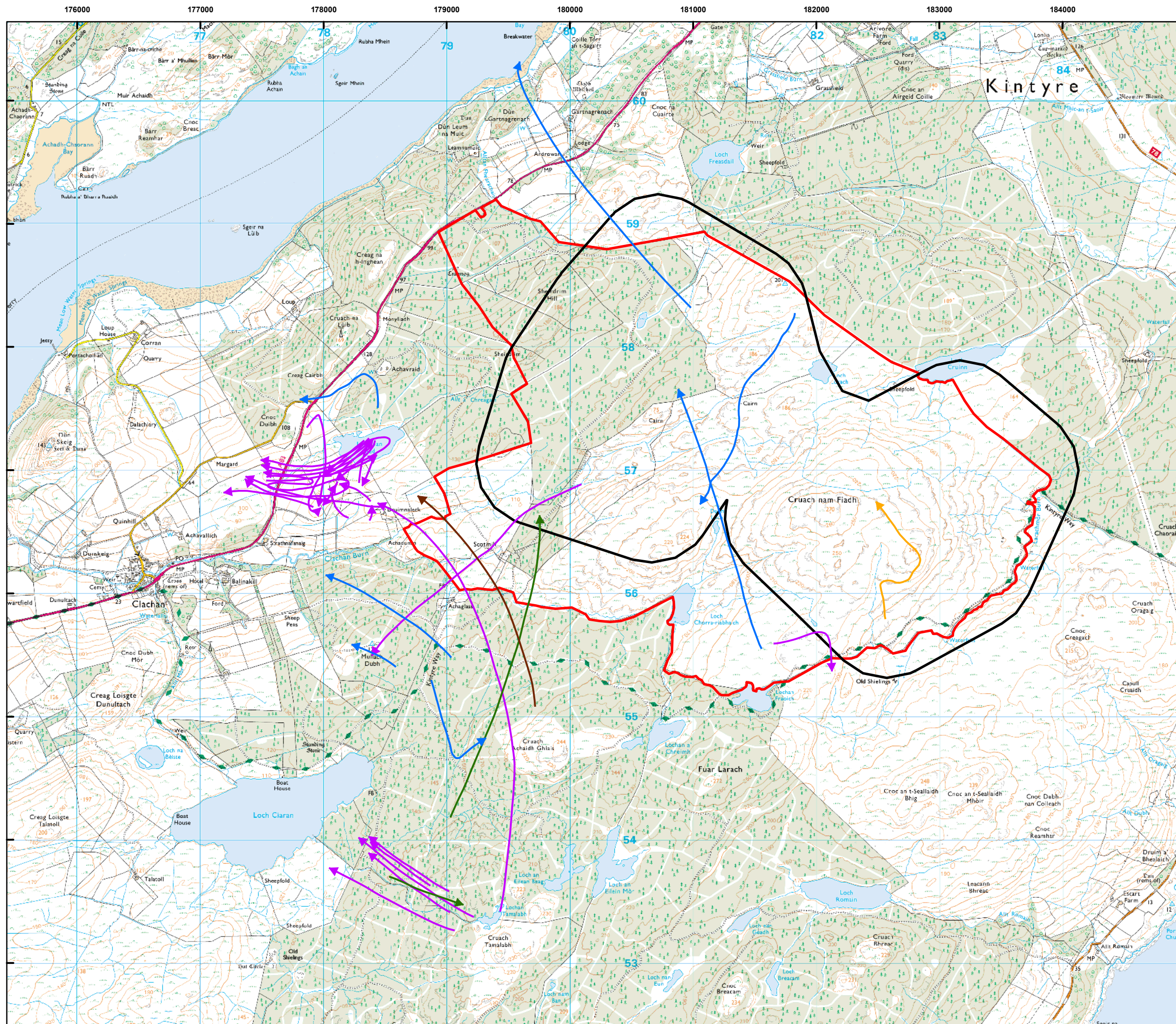
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Figure no.4

Other Diver flight activity

Sheirdrim Renewable Energy
Development



Key

-  Barnacle goose
-  Greenland white-fronted goose
-  Greylag goose
-  Goose sp.
-  Whooper swan
-  Flight activity survey area
-  Application boundary

Date produced: 24/09/2019
Source: NRP LTD

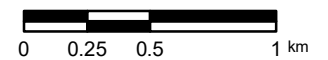
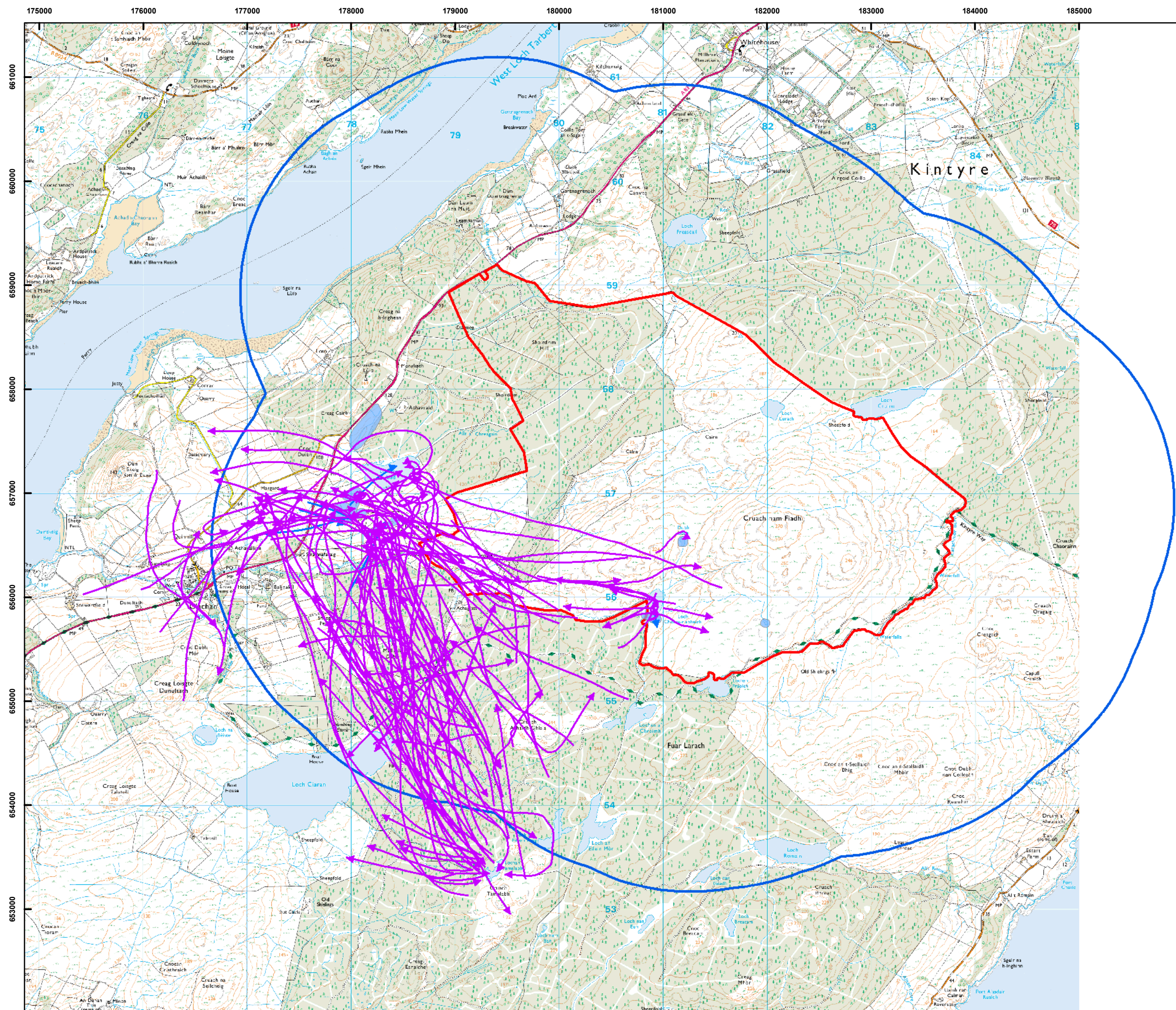


Figure no.6

GVP Goose and Swan flight activity

Sheirdrim Renewable Energy
Development



Key

- FVP flight
- Other flight
- Other flight area
- 2km buffer
- Application boundary

Date produced: 24/09/2019
Source: NRP LTD

0 0.25 0.5 1 km



Figure no.8
**Other Greenland white-fronted
goose flight activity**

Sheirdrim Renewable Energy
Development