LOCHLUICHART WINDFARM EXTENSION II S37 APPLICATION

BREEDING BIRD SURVEY REPORT 2021

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Executive Summary

Contents	Summary
Site Location	Nevis Environmental Ltd (Nevis) was commissioned by Bluebell Wind Farm Ltd, the Applicant, to carry out ornithological surveys to provide baseline information for an application under Section 37 ('s37') of the Electricity Act (1989) to construct an overhead line (OHL) between the consented Lochluichart Wind Farm Extension II to the existing Corriemoillie substation. The s37 Application also incorporates 'associated works' sections in the north and south where the cable will be undergrounded (combined total length approximately 1.3km). The OHL route, together with a 100 m wayleave corridor is hereafter referred to as 'the site'. The site is located 4.5 km north-west of Garve, in Rosshire, centred on Ordnance Survey (OS) grid reference (NH 3334 6686).
Proposals	It is proposed to construct a new 33 kV single circuit grid connection supported on "H" wood poles to connect the approved Lochluichart Wind Farm Extension II to the existing electricity substation at Corriemoillie.
Survey Scope	The objectives of the report are to: • Carry out a desk study, to obtain existing information on statutory and non-statutory sites of nature conservation interest and relevant records of relevant bird species within the site and its zone of influence; • Outline the results of surveys carried out in 2021 for black grouse, breeding waders, breeding divers and breeding raptors within appropriate buffers of the OHL, together with a vantage point survey of the OHL route; • Carry out an assessment of the ornithological features present, any constraints they pose to the proposals and any recommendations for avoidance, mitigation, compensation or enhancement measures that are needed (as appropriate).
Results	**Previous studies:** Previous studies undertaken under the Lochluichart Wind Farm HMP between 2011 and 2020 include breeding wader surveys and breeding diver surveys. An ornithological study in respect of a S36 application to vary the tip height of the consented Lochluichart Extension II Wind Farm ran concurrently with the studies for the OHL. The outcomes of the OHL studies were largely similar to those of HMP work and the S36 study. **Designated sites:** Glen Affric to Strath Conon SPA is located 2.0 km south of the site; Beinn Dearg SPA & SSSI is located 6.5 km north of the site; Achanalt Marshes SPA & SSSI is located 6.8 km south-west of the site; Ben Wyvis SPA is located 9.9 km east of the site; Ben Wyvis SSSI is located 9.1 km east of the site. **Vantage Point Surveys:** A total of 100 flight lines and 62 ground-based registrations were recorded for 13 target species and four secondary species during the vantage point watches. Target species recorded were: black grouse, golden eagle, golden plover, goosander, greylag goose, greenshank, little grebe, mallard, osprey, pink-footed goose, red kite, red-throated diver and teal. **Moorland Breeding Bird Survey (MBBS):** Four territories of golden plover, five territories of snipe and additional confidential species were recorded during the MBBS. Two territories of common sandpiper were recorded during the raptor survey. **Breeding Raptor Survey:** Activity by golden eagle, red kite, merlin, osprey, hen harrier, buzzard and kestrel was recorded during the raptor survey. Red kite was the most active species in the vicinity of the proposed OHL. **Black Grouse Survey:** Six black grouse leks were registered within 1.5 km of the proposed OHL route. The closest lek to the route was a single bird located 0.32 km to the south-east

	of the line on the southern slope of Beinn a' Bhric. In addition to lekking birds, groups of up to three and four black grouse were regularly observed foraging within areas of newly planted trees within Corriemoillie Wind Farm. **Breeding Diver Survey:** The results of the breeding diver survey are presented in confidential **Appendix 1**.

Recommendations	**Construction Phase Mitigation:**
	• A Construction Environmental Management Plan (CEMP) should be prepared for the site to outline the measures to be taken to ensure environmental protection during the construction process. The CEMP should include a Bird Protection Plan (BPP).
	• Ground clearance operations should be carried out outside the periods when nests could be present (01 April to 15 August in this locality). In the event that it is necessary to undertake ground clearance within the breeding season, the area would be searched by a qualified ecologist no more than 24-hours before clearance occurs.
	• Should construction be scheduled to commence during the bird breeding season, pre-construction surveys for raptors, diver and breeding bird surveys, including black grouse must be carried out.
	• During construction, walkover breeding bird surveys should also be carried out between April to August on a regular basis, to attempt to detect breeding territories and nests. If a nest is detected for any bird species, then an appropriate buffer zone, would be employed to protect it from damage and/or disturbance.
	Operational Phase Mitigation:
	• Mitigation will be built into the design of the infrastructure to include: Insulation of key components to prevent electrocution and configuration of the infrastructure with minimum number of cable layers.
	• Line marking is required in two sections of the OHL which were considered to be 'hotspots' of activity by sensitive species:
	  ◦ Along the northern/central section of the line, between Sàil Odhar Bheag and the point the line turns south along the west face of Beinn a' Bhric ; and
	  ◦ Along the southern section around Coire Bhratag.
	• Other species-specific measures are described in confidential **Appendix 1**.
	Monitoring:
	It is recommended that the following monitoring surveys take place during the operational phase of the OHL:
	• Red-throated diver surveys of relevant waterbodies within Lochluichart and Corriemoillie estates in years 1, 2 and 5 following completion of the OHL;
	• Monitoring of line marker condition in years 1, 5, 10, 15, 20 and 25 of the line; and
	• A specific additional measure for red-throated diver (see confidential **Appendix 1**).

1 Introduction

1.1 Introduction

Nevis Environmental Ltd (Nevis) was commissioned by Bluebell Wind Farm Ltd (the Applicant), to carry out ornithological surveys to provide baseline information for an application under Section 37 ('s37') of the Electricity Act (1989) to install an overhead line (OHL), which also incorporates 'associated works' sections in the north and south where the cable is undergrounded, between the consented Lochluichart Wind Farm Extension II (the 'Consented Development') and the existing Corriemoillie substation. The s37 OHL route, together with a 50 m wayleave corridor, is hereafter referred to as 'the site'.

This report has been prepared by Nevis Ornithologist Daniel Plunkett BSc.

Please note: All confidential records of protected species are presented in a separate and Confidential **Appendix 1**, which should not be made available to the public.

1.2 Site Location

The site is located 4.5 km to the north-west of Garve in Rosshire, Highland and is centred on Ordnance Survey (OS) grid reference (NH 3334 6686). The site lies between Lochluichart Wind Farm (the 'Operational Scheme') and Corriemoillie Substation and follows the boundary between Lochluichart and Corriemoillie estates. The site mainly comprises wet heath with elements of blanket bog to the north and acid grassland and coniferous plantation to the south. The ornithological survey areas were based on the site and are defined in section 2.2 and shown on **Figure 1**. The wider survey area comprises of mountainous/hilly terrain, upland moorland, areas of blanket bog, mature coniferous plantation, young replanted conifers and small areas of birch scrub. To the south, semi-improved grassland, rough grazing, and pockets of broadleaved woodland are present. Fresh water habitat consists of large to medium-sized lochs, and smaller upland lochans. The site is drained by tributaries of An Strathan and a small unnamed watercourse which flows into Loch Luichart, to the west of Lochluichart Lodge. The site and wider survey area are managed for deer stalking, as well as red grouse *Lagopus lagopus* and annual pheasant *Phasianus colchicus* shoots, forestry and agriculture.

1.3 Development Proposals

The proposal is the construction of a new 33 kV single circuit grid connection supported on "H" wood poles to connect the Consented Development to the existing electricity substation at Corriemoillie.

The overhead line would have a length of approximately 5.82 km with the approximate grid references being the start point at the Consented Development in the north (NH 33237 N68922), and the end point in the south at Corriemoillie substation (NH 34441 863890). It is anticipated that the wooden poles will be approximately 12 m-16 m in height with the average span between them approximately 90 m -110 m.

Access for construction is anticipated to utilise the existing access track for the Operational Scheme to the north, with a construction compound sited at an appropriate location as part of the final design process. Construction best practice would be adopted on site during construction, subject to consultation and agreement with statutory consultees, and would include adherence to an agreed Construction and Decommissioning Environmental

Management Plan, anticipated to incorporate a Pollution Prevention Plan, Drainage Management Plan, Habitat Management Plan, Access Management Plan and Construction Site License (under Controlled Activities Regulations) as necessary. Some limited tree felling may also be required in the southern part of the route within the area of coniferous plantation.

1.4 Purpose of the Report

The objectives of the report are to:

- Carry out a desk study, to obtain existing information on statutory and non-statutory sites of nature conservation interest and relevant records of relevant bird species within the site and its zone of influence;
- Outline the results of surveys in 2021 for black grouse *Tetrao tetrix*, breeding waders, breeding divers and breeding raptors within appropriate buffers of the OHL, together with a vantage point survey of the OHL route;
- Carry out an assessment of the ornithological features present, any constraints they pose to the proposals and any recommendations for avoidance, mitigation, compensation or enhancement measures that are needed (as appropriate).

2 Methods

2.1 Desk Study

2.1.1 Previous Reports and ongoing studies

Lochluichart Wind Farm HMP

Breeding bird surveys have been undertaken at the Operational Scheme and a nearby control site between 2011 and 2018, with the windfarm becoming operational in 2014. Red throated diver surveys have been completed in 2019 and 2020.

The following documents have been reviewed during the production of this report:

- Lochluichart Wind Farm - Comparison of ornithological survey data collected between 2014 and 2018 (Natural Research Projects, 2019), detailing the results of moorland breeding bird surveys and red-throated diver surveys of the wind farm site and a control site, located approximately 5 km to the north-west;
- Confidential report on the monitoring of red-throated divers at Lochluichart Wind Farm in 2019 (Galbraith, 2019), detailing the results of breeding and post-breeding surveys for red-throated diver within Lochluichart Windfarm; and
- Confidential report on the monitoring of red-throated divers at Lochluichart Wind Farm in 2020 (Galbraith, 2020), detailing the results of breeding and post-breeding surveys for red-throated diver within Lochluichart Windfarm.

Lochluichart Wind Farm Extension II Section 36 Surveys

Ornithological surveys have been undertaken by Avian Ecology to inform a T&CPA application in respect of Lochluichart Extension II between February and August 2021. Surveys have comprised the following:

- Vantage Point (VP) Surveys between February and August 2021, from one VP located on Meall Mhic Iomhair and facing north;
- Black grouse surveys within 1.5 km of the proposed Lochluichart Extension II site;
- Breeding wader surveys within 500 m of the s36 site (the MBS survey area for the s37 application overlapped with that for the Lochluichart Extension II application to the south of the confluence of Allt Guibhais Mòr and Allt na Beinne Lèithe Bige); and
- Breeding raptor surveys within 2 km of the s36 site (the northern part of the raptor survey area for the s37 application overlapped with that for the Lochluichart Extension II application).

The survey reports weren't available at the time of writing, but the survey data were reviewed during the production of this report.

Corriemoillie Wind Farm HMP

Nevis has been involved in the ornithological monitoring at the adjacent Corriemoillie Wind Farm since 2017, with surveys carried out under the Habitat Management Plan (HMP) in 2017, 2018, 2019 and 2021 for the following species/groups:

- Black grouse;
- Breeding waders;
- Breeding divers (including lochan VP surveys, when pairs have bred); and
- Breeding raptors.

As the survey areas for the above significantly overlapped with those required for the OHL, the extensive archive of data collected for Corriemoillie has been referred to in the assessment of the results of the 2021 surveys and the potential effects of the OHL on ornithological features.

2.1.2 Local Ecological Records Centre

Information was requested from Highland Raptor Study Group on the following ornithological features:

- Golden eagle nest and territory records within 6 km of site;
- Records of other schedule 1 species of raptors within 3 km of site;

2.1.3 Online Resources

The following web-based databases were also accessed:

- Department for Environment Food and Rural Affairs (DEFRA) MAGIC, for information on the locations of statutory designated sites.
- NatureScot SiteLink for information on statutory designated sites.

2.2 Field Surveys

The following ornithological field surveys were undertaken as agreed with NatureScot:

- VP surveys from 2 VPs, with a third VP added in late June to cover breeding divers;
- Moorland breeding bird survey of the site and 500 m buffer;
- Breeding diver survey of the site and 1 km buffer;
- Black grouse survey of the site and 1.5 km buffer; and
- Breeding raptor survey of the site and 2 km buffer.

Survey dates and weather conditions are presented in **Appendix 2** and survey areas are shown in **Figures 2** and **3**. Survey methods are detailed further in Sections 2.2.3 - 2.3

2.2.1 Vantage Point Surveys

The purpose of flight activity (vantage point) surveys was to record flight lines of species potentially sensitive to collision with infrastructure in order to gain a qualitative assessment of collision risk with the OHL. The survey methodology followed that outlined within SNH (2017), with the direction of movement, height and activity of all target and secondary species recorded, in addition to details on age, gender and behaviour of individual birds. Birds on the ground within the survey area were also recorded. With specific reference to vantage point surveys, target species were considered to comprise the following:

- Qualifying species of all sites of international importance for nature conservation designated for their ornithological interest within 10 km (see section 3.1.2).
- Raptor species listed on Annex I of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Wader species listed on Annex I of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- All diver and grebe species;
- All ducks, geese and swans; and
- Black grouse.

In addition, activity by the following secondary species considered to be potentially relevant to the proposals (i.e. particularly vulnerable to collision or effects of habitat loss/disturbance) was recorded during the surveys:

- All other wader species (e.g. snipe *Gallinago gallinago*);
- All other raptor species (e.g. buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*) and raven *Corvus corax*.

Two vantage point (VP) locations were utilised (**Figure 2**), to allow the full extent of the line to be covered. These were discussed with NatureScot in spring 2021 prior to surveys commencing:

- **VP1** – NH 32672 68393 - South-eastern slope of Meallan Caoruinn, west of Lochluichart access track and proposed grid connection line, looking south-east and covering the northern section of the proposed OHL.
- **VP2** – NH 32838 64574 - Eastern slopes of Creag Mhòr, south-west of the Lochuichart Hydro Power station. Looking north-east and covering the southern extent of the proposed OHL.

Six hours of survey were undertaken from each VP per month, to cover the period April to August 2021 (inclusive), as agreed with NatureScot. Due to late commissioning, in April, nine hours of VP watches were undertaken from each VP during April and May to make up for the lack of survey effort in March. Individual watches lasted for three hours and were varied to start and finish at different times of day, including to cover crepuscular and daytime periods. Where surveys ran consecutively at a given vantage point location, a break of at least 30 minutes was taken by the surveyor.

In addition, a further VP was utilised for diver lochan monitoring under the Corriemoillie Wind Farm HMP (**Figure 2**):

- **VP3** – NH 33730 67294 – On the Corriemoillie wind farm track North of Lochan Corie Muilidh, east of the central/northern extent of the proposed OHL route. Looking south.

The following height bands were recorded during the VP survey:

- Band A - 0-25 m (risk height);
- Band B - 26-50m; and
- Band C > 50 m.

A total of 39 hours of watches were undertaken from VP3 between 21st of June and 22nd of July. The primary objective of the surveys was to collect flight line data on red throated diver *Gavia stellata*, however, as this part of the VP survey area was furthest from VP1 and VP2, the opportunity was taken to record all target and secondary species to increase the likelihood of detecting smaller species in this location

2.2.2 Moorland Breeding Bird Survey (MBBS)

The Brown and Shepherd (1993) method was used to survey for moorland breeding bird (upland wader species) territories, with four visits being made between mid-April and early July 2021, in accordance with (SNH, 2017). This methodology ensured that every part of the survey area was visited to within 100 m, the surveyor walking parallel transects 200 m apart over each 500 m^2 quadrat and spending 20 to 25 minutes within each quadrat, with the survey route varied between visits. Regular stops were made to scan and listen for birds. Surveys were carried out between 08:00 and 18:00 and in favourable weather conditions. All wader species were recorded. Additional species were also noted as appropriate, such as raptors and notable passerines. Birds were recorded on electronic maps for accuracy, using standard BTO codes for species and activity as per Gilbert *et al* (1998).

Territory Analysis

Following the surveys, all survey data was analysed to estimate the number of breeding territories for all wader species recorded during the moorland bird surveys. Many of these species are listed on one or more of the following:

- Annex I of the Birds Directive;
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- The Scottish Biodiversity List;
- The Sutherland Biodiversity Action Plan; and
- Red and Amber list Birds of Conservation Concern (Eaton, et al., 2015).

Data was collected digitally using iPads for accuracy of location and QGIS software was used to collate species records. Simultaneous registrations were used to denote different wader territories, with reference to Calladine *et al* (2009). A distance of 500 m for all species was used to define separate territories of the same species, with the exception being 200 m for Dunlin *Calidris alpina alpina*. In some cases, the ecology and behaviour of certain species, together with the habitat they were seen in was used to deviate from these distances, using professional judgement as appropriate. In accordance with BTO survey guidance, the following behaviours were used to classify possible, probable or confirmed territories:

Possible breeder

- Species observed in breeding season in suitable nesting habitat; and
- Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat.

Probable breeding

- Pair observed in suitable nesting habitat in breeding season;
- Permanent territory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more apart at the same place or many individuals on one day;

- Courtship and display;
- Visiting probable nest site;
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby; and
- Nest building.

Confirmed breeding

- Distraction-Display or injury feigning;
- Used Nest or eggshells found (occupied or laid within period of survey);
- Recently fledged young (nidicolous species) or downy young (nidifugous species);
- Adults entering or leaving nest-site in circumstances indicating an occupied nest;
- Adult carrying faecal sac or food for young;
- Nest containing eggs; and
- Nest with young seen or heard.

2.2.3 Breeding Raptor Survey

A survey was undertaken to record the presence of other breeding raptor species within a 2 km buffer. Species listed on Annex I of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were sought, together with other species such as red and amber listed birds of conservation concern. Four visits were made between April and August 2021. The initial visits comprised visiting all areas considered suitable for breeding raptors such as crags and rocky outcrops and areas of deep heather or other dense vegetation suitable for ground-nesting species. Tree cover is limited to the south of the site where the cable will be underground and therefore the site was considered unsuitable for tree-nesting species. Data was collected digitally using background maps to ensure accuracy of location, particularly where nest sites were noted.

Where confirmed or potential breeding activity was noted, during both raptor walkover surveys and any other surveys, specific methodologies for the relevant species were employed on subsequent visits, as per Hardey *et al* (2013) and nest sites were monitored via vantage point watches from a suitable distance for their success. Signs of raptor presence, such as feeding remains, feathers and old nests were also recorded as appropriate. Nest monitoring was supplemented by surveys undertaken by the Raptor Study Group, with known nest sites from previous breeding seasons being visited to ensure up-to-date records were collected. Results are provided and these have used to inform the assessment of impacts within this report.

2.2.4 Breeding Diver Survey

Walkover Surveys

Walkover surveys for red-throated diver and black-throated diver *Gavia arctica* were undertaken on all waterbodies considered to provide suitable nesting habitat within a 1 km radius of the site. The survey area was covered during the moorland bird surveys and the raptor surveys, to avoid unnecessary additional disturbance of the site. Surveyors conducted initial watches from a safe distance in order to establish the presence of any divers on the waterbodies or their banks. Where divers were observed, their behaviour and activity were recorded

digitally to ensure accuracy of location. Signs such as displays, calling, copulation and birds leaving the water to go ashore were taken to indicate breeding attempts.

Where no divers were observed at a suitable waterbody, the perimeter of the waterbody was walked to identify whether any breeding attempts had been made; evidence suggesting previous or failed breeding attempts was considered to include nest scrapes, broken egg shells and remains of young in addition to signs such as feathers from diver species.

Lochan VPs

Where breeding activity by diver species was confirmed, further detailed surveys, in the form of vantage point watches at the relevant loch/lochan(s), were carried out. The surveys were undertaken in accordance with Gilbert et al., (1998) and SNH (2017) and entailed a number of vantage point watches from strategic points to ensure flight lines to and from the loch/lochan could be recorded without causing disturbance to nesting birds.

Further information on diver surveys is provided in confidential **Appendix 1**.

2.2.5 Black Grouse

Black Grouse surveys were undertaken in accordance with the methods set out in Gilbert *et al* (1998) . Two survey visits were carried out, one in mid-April and one in early May. Surveys commenced one hour before dawn and concluded two hours after dawn and comprised a search of the site for leks utilising a pre-planned transect with regular stops to listen for lekking black grouse and to observe the site from suitable vantage points. Where leks were encountered they were observed from a vantage point, located at a sufficient distance to avoid disturbance, and the number of lekking males counted. Survey visits were carried out in dry and calm conditions, with the wind not exceeding Beaufort force 3.

2.3 Limitations

Some small parts of the survey areas for raptor and divers were inaccessible during visits 1 (April) and 2 (May) of the walkover surveys due to site management activities associated with grouse management. These areas were broadly located on the ground west of the Operational Scheme. The access restrictions were not considered to be a significant limitation to the study as the restricted areas could be looked into from adjacent vantage points and navigated around using routes that avoided the core of restricted zones. The areas were largely made fully accessible from mid-May onwards.

Further information on limitations is provided in confidential **Appendix 1**.

3 Baseline Conditions

All relevant ecological data provided by the consultees was reviewed and the results from these investigations are summarised below. The original desk study data is available upon request. Confidential data is reported in **Appendix 1** which has the same overall structure as this report. Survey results are presented in **Appendix 4**. A summary of policy and legislation relating to the species highlighted by the desk study and field survey is presented in **Appendix 5**.

3.1 Desk Study

3.1.1 Previous Reports and ongoing studies

Lochluichart Wind Farm HMP

Five Year Summary Report 2014-2018

The surveys recorded between three and six confirmed golden plover *Pluvialis apricaria* territories (0.46 to 0.92 territories per km^2) within the windfarm area (652 ha comprising a 500 m buffer on the constructed turbines). There was significant overlap between the northern parts of the survey areas in 2021 and those in the 2014-2018 moorland breeding bird surveys but limited overlap to the south. Surveys of the overlapping areas in 2014-2018 found golden plover associated with the low lying area of Lòn Odhar in 2014, 2015 and 2016 and also with Meallan Caoruinn in 2014, 2015, 2016 and 2017.

The density of golden plover in these surveys was found to be similar to the density of golden plover within the control site and it was concluded that construction of the wind turbines had not affected the overall density of golden plover on the wind farm site. The study also found that golden plover may have returned to areas where they nested prior to construction of the turbines and to use breeding territories which are between turbines.

The surveys recorded a similar assemblage of bird species as recorded by the Corriemoillie HMP surveys and the surveys undertaken in 2021 including red-throated diver, red grouse, red kite *Milvus milvus*, buzzard, golden eagle A*quila chrysaetos*, osprey *Pandion haliaetus*, kestrel, golden plover, greenshank *Tringa nebularia* common sandpiper *Actitis hypoleucos*, snipe, dunlin (in 2015 only) and merlin *Falco columbarius*. No breeding raptor species were recorded on the wind farm site between 2014 and 2018.

Additional information is presented within confidential **Appendix 1**.

Diver Monitoring Report 2019

Information on this report is presented within confidential **Appendix 1**.

Diver Monitoring Report 2020

Information on this report is presented within confidential **Appendix 1**.

Lochluichart Wind Farm Extension II Planning Application Surveys

The VP surveys from VP2 recorded 16 records of golden eagle, two records of greylag goose *Anser anser*, one record of golden plover and one record of whooper swan *Cygnus cygnus*. No flight lines of any species were recorded crossing the proposed OHL route, however golden eagle came within 165 m west of the line. All other golden eagle records were more than 0.75 km west of the proposed OHL and associated with the ridgeline west of the proposed turbines, which comprises Meall Mhic Iomhair, Meal nan Caorach, Beinn Liath Beag and Meal na Speireig.

There was one notable difference in the walkover survey results which is discussed in confidential **Appendix 1**, otherwise the results set out in section 3.2.2 are largely in agreement between the Nevis and Avian surveys. Therefore, the Avian results are not described in detail here.

Avian collected five records of golden eagle and one record of red kite. Only one record was within the survey area for the s37 and this was of a golden eagle flying over the site, approximately 1.0 km north-west of the proposed OHL. All other records were more than 2 km from the OHL and included one flight record of a red kite and two flight records of golden eagle to the north of Loch Glascarnoch and one record of a golden eagle from the ridgeline west of the site.

3.1.2 Designated Sites

There are four Special Protection Areas (SPA) within 20 km of the site, all of which are also Sites of Special Scientific Interest (SSSI) (Table 1 and **Figure 1**). There are no additional SSSI with ornithological features within 20 km of the site.

Table 1 Statutory designated sites with ornithological features within 20 km of the site

Site Name and Designation	Proximity and Direction to the Site	Designated Features
Glen Affric to Strath Conon SPA	2.0 km south	Glen Affric to Strath Conon SPA qualifies as an SPA by regularly supporting populations of European importance of the Annex 1 species: • Golden eagle (10 active territories in 2003, 2.2% of the GB population).
Beinn Dearg SPA & SSSI	6.5 km north	Beinn Dearg SPA qualifies as an SPA by regularly supporting populations of European importance of the Annex 1 species: • Dotterel *Charadrius morinellus* (from 1987 to 1993, an average of 22 pairs of dotterel bred within the Beinn Dearg SPA representing 3% of the British breeding population. In spring, Beinn Dearg acts as a staging area for dotterel that go on to breed elsewhere in Britain and in Scandinavia). Beinn Dearg SSSI is designated in part for its upland breeding bird assemblage, which includes: golden eagle, dotterel, snow bunting *Plectrophenax nivalis*, ptarmigan *Lagopus muta*, ring ouzel *Turdus torquatus,* raven *Corvus corax*, golden plover and peregrine falcon *Falco peregrinus*.

Site Name and Designation	Proximity and Direction to the Site	Designated Features
Achanalt Marshes SPA & SSSI	6.8 km south-west	Achanalt Marshes SPA qualifies as an SPA by regularly supporting populations of European importance of the Annex 1 species: • Wood sandpiper *Tringa glareola* with an average of 3 breeding pairs between 1991-1995, representing 50% of the British breeding population. Achanalt Marshes SSSI is designated in part for its breeding bird assemblage, which includes: golden plover, common sandpiper, wood sandpiper, dunlin, curlew *Numenius arquata*, snipe, redshank *Tringa totanus*, oystercatcher *Haematopus ostralegus* and lapwing *Vanellus vanellus*. Wildfowl breeding on the site include: goosander *Mergus merganser*, red-breasted merganser *Mergus serrator*, mute swan *Cygnus olor*, wigeon *Anas penelope*, tufted duck *Aythya fuligula*, teal *Anas crecca* and mallard *Anas platyrhynchos*.
Ben Wyvis SPA & SSSI	9.1 km east (to SSSI) 9.9 km east (to SPA)	Beinn Wyvis SPA qualifies as an SPA by regularly supporting populations of European importance of the Annex 1 species: • Dotterel (from 1987 to 1993, an average of 20 pairs of dotterel bred within the Ben Wyvis SPA, representing 2% of the British breeding population. Ben Wyvis SPA acts as a staging area for dotterel that go on to breed elsewhere in Britain and in Scandinavia).

3.1.3 Desk Study Records

Desk study records obtained from Highland RSG are discussed in confidential **Appendix 1**. The records are presented on confidential **Figure 4**.

3.2 Field Surveys

3.2.1 Vantage Point Surveys

All flight lines recorded during the vantage point surveys are illustrated in confidential **Figure 5** and are presented in **Appendix 4** together with ground-based records (for target species only). A total of 100 flight lines and 62 ground-based registrations were recorded for 13 target species and four secondary species during the vantage point watches undertaken between April and August 2021. A total of 55 flight lines and 49 ground registrations of target species were recorded (Table 2).

Table 2 Flight Lines and ground registrations for target species recorded during vantage point surveys in 2021

Species	Legal/Conservation Status	No. Flight lines	Ground-based Registrations
Black grouse	SBL, BoCC Red	-	1
Golden eagle	SPA, Annex I, WCA Sh1, SBL	1	-
Golden plover	Annex I, SBL	-	5
Goosander	-	-	1
Greylag goose	BoCC Amber	1	-

Species	Legal/Conservation Status	No. Flight lines	Ground-based Registrations
Greenshank	WCA Sh1, BoCC Amber	3	1
Little grebe *Tachybaptus ruficollis*	BoCC Green	-	9
Mallard	BoCC Amber	-	8
Osprey	Annex 1, WCA Sh1, SBL, BoCC Amber	-	2
Pink-footed goose *Anser brachyrhynchus*	BoCC Amber	3	-
Red kite	Annex 1, WCA Sh1, SBL	36	1
Red-throated diver	Annex 1, WCA Sh1, SBL	10	13
Teal	BoCC Amber	1	8

Key:
SPA – Local SPA qualifying species (see Table 1)
WCA Sh1 – Listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)
Annex 1 – EU Birds Directive Annex I
SBL – Scottish Biodiversity List
BoCC Red and Amber – Include on Red List and Amber Lists in Birds of Conservation Concern 4 (Eaton, et al., 2015).

A total of 42 flight lines of five secondary species were recorded for; buzzard (22 flight lines), kestrel (8 flight lines), raven (8 flight lines), curlew (3 flight lines) and common gull (1 flight line).

Flight activity was greatest in the earlier spring months (April and May), with flight line numbers decreasing throughout the season. The most frequently recorded species was red kite, with 36 flight lines (over a third of the total number of flight lines recorded). Red kites appear to use the site frequently for scavenging/hunting and around one third of records (10) were in height band A. Red throated diver was the third most frequent species, with 10 flight lines, including flights recorded from VP3. Most diver flight lines were recorded in the months of June and July due to them being more active on the lochans at this time, although records of this species had been made since April. Most flights lines of red-throated diver were recorded passing through Corriemoillie wind farm, east of the proposed OHL, and flying North, presumably to fish on Loch Glascarnoch.

One golden eagle flight line was recorded during the VP surveys, from VP 1. The record was of three birds soaring on thermals rising from Meallan Caoruinn, Meallan Teth and Mellan a' Charuide, to the north of the proposed OHL route, at an average height of around 120 m. Golden eagle activity in general (also see section 3.2.3) was greatest earlier in the season, with sightings consisting mainly of a young bird hunting throughout the site.

At the end of April, approximately 275 pink footed geese, in three different flocks (200, 45 and 30 birds), were recorded flying north on spring migration. Two of the flocks flew through/over the two wind farms and another flock flew west, south of the Creag Mhòr summit; all flights crossed the proposed OHL route above collision risk height, but two of the flights were relatively low, at 30 m and 60 m average height. A single flight of a flock of

seven greylag geese were recorded in flight, over the central part of the proposed OHL above collision risk height, heading north-east through Corriemoillie Wind Farm in June.

Not including ground registrations, buzzard was the second most frequently recorded species, with 22 flight lines. One of the most common species of raptor throughout the British Isles, this species was seen from all vantage points and was most regularly occurring at the southern extent of the line, where more favourable breeding habitat is present, supporting an estimated two to three pairs. Kestrel are also a local regular resident breeding species and birds were recorded regularly hunting along the line. Kestrel are confirmed to breed locally on the opposite side of Beinn a Bhric to the proposed route but have a lower population than buzzard.

Many of the ground registrations were waterfowl species using waterbodies in the viewsheds of the VPs. These included goosander, mallard, greylag geese and teal and little grebe. Teal were present throughout the breeding season, during vantage point surveys they were most regularly recorded from VP1 as ground registrations on Loch a' Mheallain Chaorainn, especially at the start of the year. Breeding in this location was confirmed as adults were displaying on this waterbody and later in the season, teal chicks seen on this lochan, as well as on Coire Muilidh. Other species recorded mainly as ground registrations were mallard, a regular occurring species and local breeder on site, and little grebe recorded on the waterbodies in the western part of Corriemoillie Wind Farm and confirmed breeding on both Loch a' Mhealainn Chaorainn and Lochan Coire Muilidh.

Another species breeding on these lochans and noted on VPs were greenshank. At the start of the season, as many as four at a time were seen at Loch a' Mheallain Chaorainn, in flight as well as ground registrations. Three flight lines of greenshank were recorded, all at 'risk height' but mainly constrained in the vicinity of Loch a' Mhealainn Chaorainn. Golden plover were often heard calling from the hills behind VP1 (confirmed breeding location), but no flight lines of this species were recorded. On one occasion a female golden plover was seen prospecting for a nest site on the ground within 150 m east of VP 1 but no breeding was ultimately recorded in this location.

Further information is provided in confidential **Appendix 1**.

3.2.2 Moorland Breeding Bird Survey

Four upland wading bird species were recorded holding territories during the moorland breeding bird surveys, three of which are discussed in this report, with additional information in confidential **Appendix 1**. Territories of moorland breeding birds are presented in confidential **Figure 6.1** and **Figure 6.2**, with non-confidential results summarised below in Table 3.

Table 3 MBS target species and numbers of territories 2021

Species	Conservation Status	Confirmed	Probable	Possible
Golden plover	Annex I, BoCC Amber	1	0	2
Common Snipe	BoCC Amber			3
Common sandpiper	BoCC Amber		2	
Key: as Table 2				

Golden Plover

Territories of golden plover are shown in **Figure 6.2**. One confirmed breeding pair was recorded outwith the 500 m survey buffer on the slopes of Meall Mhic Iomhair west of Loch na Sàlach and the line. Another two possible breeding pairs were observed on the summits of Meall Mhic Iomhair and Meall nan Caorach. All were out with the 500 m MBBS buffer. Though golden plover was heard infrequently within the 500 m survey area, no signs of a breeding attempts or territory being held were recorded.

Common Snipe

Territories of snipe are shown in **Figure 6.2**. No confirmed territories were recorded during MBBS, however four separate records of this species were noted, only one of these within 500 m of the line. It is speculated that snipe was probably under recorded as a species, due to them being most active in territorial and breeding display around dusk or dawn. Many were heard during Black Grouse Surveys in April, but no attempt to count them was made at this time. This time being outside the timings of the Brown and Shepherd survey method.

Common sandpiper

Territories of common sandpiper are shown in **Figure 6.2**. Two common sandpiper territories, both out with the 500 m survey buffer, were recorded during the raptor survey. These were located on the banks of Loch Bad Leabhraidh, to the south-east of Corriemoillie wind farm and on the banks of Loch nam Fiadh (just NW of Creag Mhor), both probable breeders.

Red grouse

Red grouse were recorded as present within the survey area, but as much of the area surrounding the site is intensively managed for this species, detailed information on territories was not recorded.

Other notable species

At least four different male cuckoos *Cuculus canorus* were recorded singing at the start of the season around Corriemoillie wind farm, with two juvenile birds being recorded in July, proving successful breeding. One of the juvenile cuckoo was recorded in the northern boundary of Corriemoillie wind farm being pursued by a kestrel and the second adolescent cuckoo was observed being fed by a meadow pipit host upon a fence post north-east of Corie Muilidh, near a tributary of An Srathan. Also, a pair of dunlin were recorded on one once on the summit of Meall Mhic Iomhair in mid-May, well outside the moorland breeding bird survey area.

3.2.3 Breeding Raptor Survey

The breeding raptor survey results are presented in confidential **Figure 7**. Accounts of the species recorded are provided below with confidential information provided in **Appendix 1**.

Golden Eagle

Five flights in total were recorded during all surveys in 2021 within the 2 km buffer. Four of these flights were individual birds and recorded during breeding raptor surveys. One flight featuring three individuals recorded during a VP, where the three birds soared together over VP 1, gaining height from around 80m to high altitude

and heading north. It is possible one or two of these birds are resident within the territory identified to the north-east of the site.

Further information on golden eagle is presented in Confidential **Appendix 1**.

Red Kite

Information on red kite is presented in Confidential **Appendix 1**.

Merlin

A single male merlin was recorded on the 22nd of April, this was the only record of merlin made during the breeding season surveys in 2021. The bird was observed hunting in and around the Operational Scheme, briefly crossing over the route of the proposed OHL. The scarcity of records within the survey area suggest that merlin did not breed within the 2 km survey buffer of the OHL route.

Osprey

Information on osprey is presented in Confidential **Appendix 1**.

Hen Harrier

An adult female hen harrier was recorded within 500 m of the proposed OHL route, between Coire Muilidh and Lochan Dubh Beag, on 13th of July. This was the only record of hen harrier made during the breeding bird surveys in 2021.

3.2.4 Black Grouse

Results of the black grouse survey are presented in **Figure 9**. Six black grouse leks were registered within 1.5 km of the proposed OHL route in the spring of 2021, all of these being either north or west of the route. Five of these leks were single birds only, with one lek of two males recorded, approximately 1.3 km north of the proposed OHL route. The closest lek to the route was a single bird located 0.32 km to the south-east of the line on the southern slope of Beinn a' Bhric. Further single bird leks were located 0.52 km to the north-east of the line on the small plateau of Sàil Odhar Bheag and 0.57 km north of the northern extent of the route. The next closest lek was located 0.82 km east of the line; all other leks were more than 1.2 km from the proposed OHL.

In addition to lekking birds, groups of up to three and four black grouse were regularly observed foraging within areas of newly planted trees within Corriemoillie Wind Farm, to the east of the site, with 15 males seen in one day. When flushed, these birds flew south-west, crossing the route of the line between Lochan Dubh Beag and the point where the OHL route turns southwards, along the west flank of Beinn a' Bhricc.

3.2.5 Breeding Diver Survey

Information on red-throated diver is presented in Confidential **Appendix 1** and on Confidential **Figures 8** and **10**.

4 Discussion

4.1 Potential Effects of the Proposed Development

4.1.1 Potential Effects During the Construction Phase

There are a number of potential impacts which could occur during the construction phase of the proposed development; these include habitat change/ loss, disturbance/displacement, and collision, with each potential impact discussed separately in the following sections.

Habitat Change/loss

Habitat loss can be as a result of direct land-take, such as due to the construction of infrastructure, or it can result as an indirect effect due to the degradation of habitat as a result of construction activity (for example, damage to habitat in the vicinity of tracks can occur during construction).

Habitat loss can be permanent (for example where a new road is constructed) or temporary (for example, the creation of the construction compound). Because habitat loss which occurs during the construction phase may remain lost during the operational phase, it can be complex to distinguish between the effects of habitat loss during the construction phase which then becomes permanently lost; effects will therefore be considered jointly for the construction and the operational phases.

Generally, changes to habitat as a result of construction are related to habitat loss so the effect is usually negative or adverse. Habitat loss does not include functional loss (i.e. where disturbance or displacement would limit a feature's ability to use a particular area of habitat); this is assessed under disturbance/displacement.

Disturbance/displacement

Disturbance (e.g. stimuli which causes an individual to change its behaviour resulting in excessive use of energy or stress) and displacement (the action an individual takes to avoid a situation as a result of stimuli which are present) tend to have a degree of overlap (e.g. increased human presence causes disturbance which results in displacement of the disturbed individuals). As such, they will be considered together for the purposes of impact assessment. Disturbance/displacement effects within a construction environment are generally temporary and/or short-medium term but this is not always the case. In many instances, they are permanent and irreversible.

4.1.2 Potential Effects During the Operational Phase

Habitat Change/loss

As described above, habitat loss during the operational phase is considered jointly with habitat loss during construction as there is considerable overlap where habitat is lost during construction which then becomes a long-term or permanent loss during the operational phase.

Disturbance/displacement

Disturbance/displacement effects during the operational phase are associated predominantly with the presence of the line itself, which can deter birds from using the surrounding area and would be a permanent effect. Presence of the line could result in increased predation risk if pylons are used as perches by predators. Maintenance

activities can also have disturbance/displacement effect, especially in the breeding season. Barrier effects can also occur where birds are deterred from using their normal routes to feeding or roosting grounds, although the bird assemblage and small scale of the infrastructure suggests this is unlikely to occur as a result of the proposed development.

Collision with the OHL and electrocution

Overhead lines present two main hazards to birds as a result of contact with the cables:

- Mortality through collision with the cables or guy lines supporting the electricity poles can occur when a bird flies into a wire and is killed either from the impact, from hitting the ground, or from injuries sustained in the process. On power lines, bird collisions are often concentrated along relatively short sections where several factors interact to create a collision problem or 'hotspot' (SNH, 2016).
- Mortality through electrocution from power lines or supporting structures can occur on distribution power lines with smaller air gaps where a bird is electrocuted by causing a short circuit, either by touching two live wires, or a live and an earthed component as a result of flying into the line. Birds can also be electrocuted when they nest or perch on pylons, although the potential for this to occur with the proposed OHL is considered to be limited by the use of wooden poles, which provide little scope for perching and nesting.

4.2 Designated Sites

The closest designated sites with ornithological interests are Glen Affric to Strath Conon SPA (2 km south of site), Beinn Dearg SPA (6.5 km north-west of site), Achanalt Marshes SPA (6.8 km south-west of site) and Ben Wyvis SPA (10 km east of the site). As none of the SPAs lie within the site, habitat change/ loss is not considered to directly affect the SPAs.

4.2.1 Glen Affric to Strath Conon SPA

Disturbance/Displacement

Potential effects on Glen Affric to Strath Conon SPA are discussed in Confidential **Appendix 1**.

Collision/Electrocution

Golden eagle activity recorded on site was located around the eastern slopes of Meal Mhic Iomhair and the eastern slopes of Beinn Liath Bheag. All records were of foraging birds which were soaring well above the height of the line. Due to the small number of flight lines of golden eagle within 500 m of the proposed OHL (2) and the small number of flight lines recorded overall in 2021 (5) it is concluded that the risk of collision/electrocution for this species alone is negligible. Therefore, no specific mitigation is proposed for golden eagle, but it should be noted that the small residual risk of impacts to golden eagle would be mitigated by the line marking proposals set out in section 4.8.

4.2.2 Designated Sites Scoped Out of the Assessment

The qualifying feature for both Beinn Dearg SPA and Ben Wyvis SPA is Dotterel, which breeds within alpine the alpine zone, above 700 m although in Ross-shire breeding descends to 640-700m (Forrester , et al., 2007). The

site and surrounding land is outside this zone, with the nearest such habitat occurring within Beinn Dearg SPA. On the basis of the distance between the site and Beinn Dearg SPA and Ben Wyvis SPA, the lack of habitat for dotterel within the site, together with the lack of records of dotterel from the survey area in 2021, but also from the historical data collected during HMP monitoring surveys for Corriemoillie and Lochluichart, it is concluded there will be no effect on either SPA as a result of the proposals.

The qualifying feature of Achanalt Marshes SPA is wood sandpiper, which generally breeds in marshes and swamps, usually close to large lochs, although nests have also been reported in boggy ground with rock outcrops (Forrester , et al., 2007). Although there is some potential for the latter habitat on site no records of wood sandpiper were collected from the survey area in 2021, and there were also no records within the historical data collected during HMP monitoring surveys for Corriemoillie and Lochluichart. On the basis of the distance between the site and Achanalt Marshes SPA, the lack of wood sandpiper records and the limited potential habitat, it is concluded there will be no effect on this SPA as a result of the proposals.

4.3 Moorland Breeding Birds

4.3.1 Greenshank

Potential effects on Greenshank are discussed in Confidential **Appendix 1**.

4.3.2 Golden Plover

Golden plover breeds in a range of upland habitats across Scotland, including blanket bog, wet heath and on mountain tops dominated by moss and lichens, with a preference flat terrain opposed to sloping ground (Forrester , et al., 2007). The nearest confirmed golden plover territory to the proposed OHL was located 1.0 km to the south-west of the proposed route on the lower slopes of Meall Mhic Iomhair.

Due to the distribution of golden plover territories within the wider area and the distance of the recorded territories from the line, it is unlikely this development of the line will directly impact on this species in either construction or operational phase although caution should still be taken, any birds found in this stage should be noted.

Golden plover are at lower risk of collision with the proposed OHL, due to their size and flight behaviour during the breeding season, although risk of collision cannot be ruled out. It is considered that the line marking measures specified principally for red kite and red-throated diver (see section 4.8.2) will further reduce the collision risk to this species.

4.3.3 Other Moorland Breeding Bird Species

There was one record of snipe within 500 m of the proposed OHL in 2021, although this species was noted as potentially having been under-recorded by the Brown and Shepherd methodology due the crepuscular nature of its display and breeding call. Snipe could therefore potentially be impacted directly during construction of the OHL and mitigation is set out in section 4.8.1. Any short or long-term disturbance effects on snipe are not considered likely to be significant due to the small population in the vicinity of the line. No impacts on common sandpiper, dunlin or cuckoo are predicted due to the distance of their recorded territories from the proposed OHL route.

4.4 Raptors

4.4.1 Golden Eagle

Potential effects on golden eagle are discussed in section 4.2.1

4.4.2 Red Kite

Potential effects on red kite are discussed in Confidential **Appendix 1**.

4.4.3 Merlin

Merlin were recorded on one occasion during the raptor survey in 2021 and have previously been recorded very occasionally during surveys carried out under the Corriemoillie HMP. It was concluded that merlin use the survey area for foraging very occasionally but do not breed within 2 km of the site. As merlin use the site infrequently and do not breed in close proximity, disturbance and displacement effects are considered unlikely and no specific mitigation is proposed.

Due to the low activity of merlin recorded in the survey area, in total only two flights of what was believed to the same bird was recorded upon the same evening in April, the risk of collision with the line is considered to be low and no specific mitigation is proposed, although the line marking measures specified in section 4.8.2 will further reduce the collision risk to this species.

Merlin frequently hunt from perches and therefore may be at increased risk of electrocution, although their relatively small size and low activity within the vicinity of the line are mitigating factors. As the design of the line will also incorporate measures included in the line design to prevent electrocution of birds (section 4.8.2), it is considered the risk of electrocution risk to perching merlin is negligible.

4.4.4 Osprey

Potential effects on osprey are discussed in Confidential **Appendix 1**.

4.4.5 Hen Harrier

A hen harrier was recorded on one occasion during the raptor survey in 2021 It was concluded that hen harrier may use the survey area for foraging very occasionally but do not breed within 2 km of the site. As hen harrier use the site infrequently and do not breed in close proximity, disturbance and displacement effects are considered unlikely and no specific mitigation is proposed.

Due to the low activity of hen harrier recorded in the survey area the risk of collision with the line is considered to be low and no specific mitigation is proposed, although the line marking measures specified in section 4.8.2 will further reduce the collision risk to this species.

4.4.6 Other Raptor Species

Secondary species kestrel and buzzard were very active within the survey area, with flight lines occurring in the same ‘hotspots’ as identified for red kite and red-throated diver. Although no mitigation is recommended specifically for buzzard and kestrel, the line marking measures specified in section 4.8.2 will reduce the collision risk to this species.

4.5 Red Throated Divers

Potential effects on red-throated diver are discussed in Confidential **Appendix 1**.

4.6 Other Waterfowl

Three flight lines of pink-footed geese, one flight line of greylag geese and one flight line of two Whooper swans were recorded on spring migration during the last eight days in April. The majority of flight lines were heading north and therefore not obviously originating from the direction of the SPAs on the Cromarty and Moray coasts which are designated in part for these species (e.g. Cromarty Firth SPA and Moray and Nairn Coast SPA) and all flights were above 'risk height'. It is possible that the numbers of flight lines were under estimated due to the VP surveys starting in April and that the site is overflown by geese more frequently than anticipated. However, given the relatively low numbers of flight lines of geese and lack of any flights at risk height, it is considered that the risk of collisions with the line is likely to be low in this location. It is also considered that the line marking measures specified principally for red kite and red-throated diver (see section 4.8.2) will further reduce the collision risk to geese species.

One flight line of teal was recorded during the VP surveys, this was associated with Loch a' Mheallain Chaorainn where breeding evidence for teal was recorded. On the basis of the flightlines recorded it is considered that teal are at negligible risk of collision with the proposed OHL. It is also considered that the line marking measures specified in section 4.8.2 will further reduce the collision risk to this species. Teal are considered unlikely to be disturbed or displaced during construction of the proposed OHL as Loch a' Mheallain Chaorainn is more than 250 m from the line at its closest point. No long-term displacement effects are predicted as a result of the operational line.

4.7 Black Grouse

No black grouse leks of more than two birds were recorded during the surveys in 2021. There was one single-bird lek within 0.32 km of the line and a further two single-bird leks located 0.52 km and 0.57 km from the line. The results of the 2021 surveys are consistent to post-construction monitoring under the Corriemoillie Wind Farm HMP, which has recorded a decline in lekking black grouse since 2017, when a lek of five males was recorded to the north of Corriemoillie wind farm. This is despite up to 15 non-breeding males being recorded foraging within a newly re-planted area of the wind farm in early April 2021.

The single bird lek on the south side of Beinn a' Bhric is most at risk of displacement during construction. The other two closest single-bird leks around Sàil Odhar Bheag are at less risk of displacement being located over 500 m from the line. It is considered that the risk of displacement for these leks can be reduced to negligible by adjusting the works start time during the lekking season; these measures are detailed in section 4.8.1. Temporary displacement of the single-bird lek on Beinn a' Bhric cannot be ruled out, but it is concluded that this would not have a significant effect on the local black grouse population. Long-term displacement of any of the nearby leks is not considered likely.

Black grouse are susceptible to collision with OHL, however they are considered to be at low risk given relatively few flights were observed across the OHL route. However, given that black grouse are likely to commute from the young coniferous plantation in Corriemoillie Wind Farm to forage within open moorland on Lochluichart Estate

line marking is required, particularly as any grouse following this route would need to navigate at least two deer fences, not all of which have visual markers. Line marking proposals are detailed section 4.8.2.

4.8 Mitigation

4.8.1 Construction Phase

A Construction Environmental Management Plan (CEMP) should be prepared for the site to outline the measures to be taken to ensure environmental protection during the construction process. The CEMP should include a Bird Protection Plan (BPP) and provision for an appropriate level of site attendance by a suitably experienced Environmental/Ecological Clerk of Works to oversee implementation of the CEMP and BPP.

Ground clearance operations involving the removal of vegetation should only be carried out outside the periods when nests could be present (01 April to 15 August in this locality). In the event that it is necessary to undertake ground clearance outwith these times then the area would be searched by a qualified ecologist no more than 24-hours before clearance occurs.

In addition, because of black grouse and Schedule 1 breeding birds being present in the area, should construction be scheduled to commence during the bird breeding season then, before construction commences, raptor, diver and breeding bird surveys, including black grouse, would be carried out of the site plus appropriate buffers (2 km for breeding raptors, 500 m for breeding waders, 1 km for breeding divers and 1.5 km for breeding black grouse) to locate sensitive breeding species and ensure adequate nest protection is put in place. Methodologies for the surveys should follow those outlined in section 2.2

If a nest is detected for any bird species, then a buffer zone would be employed to protect it from damage and/or disturbance. The buffer zone would be dependent upon the sensitivity of the species and its legal protection. Although legally only species listed on Schedule 1 of the Wildlife and Countryside Act (W&CA) are protected from disturbance at or around their nest, for the purposes of the project, disturbance to Annex I species would also be minimised to try to reduce impacts on any nests which may occur. Buffer distances should be based on established guidance (Ruddock & Whitfield, 2007) or professional judgement/experience on other projects where the species is not listed.

Once construction commences, walkover breeding bird surveys should also be carried out between April to August on a regular basis, to attempt to detect breeding territories and nests.

Specific measures for red-throated diver

Specific measures for red-throated diver are discussed in Confidential **Appendix 1**.

Specific measures for black grouse

Three leks were recorded within 570m of the proposed OHL in 2021. Pre-construction surveys for black grouse will take place if construction occurs during the bird breeding season. Should any leks be recorded within 600m of the works area then the works must not start within two hours of sunrise in these locations between late March and the end of May.

4.8.2 Operational Phase

Mitigation by Design

Mitigation will be built into the design of the infrastructure to include:

- Insulation of key components to prevent electrocution of birds perching on poles; and
- Configuration of the infrastructure with minimum number of cable layers.

Further detail on these measures is expected to be provided by a planning condition that would be agreed with NatureScot prior to construction of the OHL.

Specific measures for red-throated diver

Specific measures for red-throated diver are discussed in Confidential **Appendix 1**.

Line Marking

Current NatureScot guidelines on assessing the impact of powerlines (SNH, 2016) recognise that collision risk cannot be accurately predicted for OHL. Instead, there is a focus on mitigation, including identifying hotspots of bird activity and targeting mitigation in these locations.

The proposed OHL is located in an area that is used by red-throated diver, black grouse and an assemblage of target raptor species: red kite, golden eagle, osprey, kestrel, merlin, buzzard, sparrowhawk and hen harrier. Activity by raptors, divers and black grouse was concentrated in two main sections of the proposed OHL route:

- Along the northern/central section of the line, between Sàil Odhar Bheag and the point the line turns south along the west face of Beinn a' Bhric ; and
- Along the southern section around Coire Bratag.

Line marking is widely recognised to reduce collision rates from vulnerable birds approaching close to power lines (Williams, et al., 2020). Line marking is therefore proposed along the above sections of the proposed OHL, in order to mitigate the risk of collision by red-throated diver and target raptor species, especially red kite which are very active in these areas. The locations of the proposed line markers are shown in **Figure 11**.

A review carried out by Williams et al (2020) found that all types of markers except thin black plastic strips or neoprene crosses were effective, with no differences in effectiveness between Bird Flight Diverters (BFDs: brightly coloured plastic spirals) and static fibreglass plates and only a small possible difference between BFDs and 'flappers' (moving markers). Spacing of the markers should follow the specification set out in SNH (2016) and be installed at 5 m intervals, although they can be at staggered 10 m intervals on multiple wires to give the impression of a 5 m placement and should be as large as possible. The line markers will need maintenance and replacement to ensure they remain functional during the lifetime of the proposed OHL. Monitoring is proposed in section 4.9.

4.9 Monitoring

Monitoring of bird populations in the vicinity of the Operational Scheme has taken place 2012 – 2021. It is recommended that the following monitoring surveys take place during the operational phase of the OHL:

- Red-throated diver surveys of relevant waterbodies within Lochluichart and Corriemoillie estates in years 1, 2 and 5 following completion of the OHL;
- Monitoring of line marker condition in years 1, 5, 10, 15, 20 and 25 of the line; and
- A specific additional measure for red-throated diver (see Confidential **Appendix 1**).

It is recommended that all ornithological surveys are coordinated with the Lochluichart Extension II HMP and with the operators of Corriemoillie Wind Farm, to ensure that disturbance to breeding bird populations is minimised.

5 References

Brown, A. F. & Shepherd, K. B., 1993. A method for censusing upland breeding waders.. *Bird Study,* 40(3), pp. 195-198.

Calladine , J., Garner, G., Wernham, C. & Thiel, A., 2009. The influence of survey frequency on population estimates of moorland breeding birds.. *Bird Study,* 56 (3), p. 381 – 388.

DPEA, 2016. *WIN270-2: Report to Scottish Ministers Strathy South wind farm,* s.l.: s.n.

Eaton, M. et al., 2015. Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *Bird Study,* pp. 708-746.

Forrester , R. et al., 2007. *The Birds of Scotland.* Aberlady: Scottish Ornithologists' Club.

Galbraith, C. A., 2019. *Confidential report on the monitoring of red-throated divers at the Loch Luichart Wind Farm in 2019,* s.l.: s.n.

Galbraith, C. A., 2020. *Confidential report on the monitoring of red-throated divers at the Loch Luichart Wind Farm in 2020,* s.l.: s.n.

Gilbert, G., Gibbons, D. W. & Evans, J., 1998. *Bird Monitoring Methods: a manual of techniques for key UK species.* Sandy(Bedfordshire): RSPB.

Hardey, J. et al., 2013. *Raptors: A Field Guide for Surveys and Monitoring.* Edinburgh: The Stationery Office.

Natural Research Projects, 2019. *Loch Luichart Wind Farm - Comparison of ornithological survey data collected between 2014 and 2018,* s.l.: s.n.

Ruddock, M. & Whitfield, D. P., 2007. *A Review of Disturbance Distances in Selected Bird Species,* s.l.: Scottish Natural Heritage.

SNH, 2016. *Assessing Connectivity with Special Protection Areas (SPAs) - Version 3,* s.l.: s.n.

SNH, 2016. *Assessment and Mitigation of impacts of power lines and guyed metrological masts on birds - version 1.* s.l.:s.n.

SNH, 2017. *Recommended bird survey methods to inform impact assessment of onshore wind farms,* s.l.: SNH.

Williams, D. R. et al., 2020. What Works in Conservation 2020. In: *Bird Conservation.* Cambridge: Open Book Publishers, pp. 137-281.

Wilson, M. W., Austin, G. E., Gillings, S. & Wernham, C. V., 2015. *Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504,* s.l.: s.n.

Figures

Figure No.	Title
Figure 1	Site Location and Statutory Designated Sites
Figure 2	VP Locations and Viewsheds
Figure 3	Breeding Bird Survey Areas
Figure 4	Confidential Highland Raptor Study Group Records – confidential (see **Appendix 1**)
Figure 5	Confidential Vantage Point Survey Results confidential (see **Appendix 1**)
Figure 6.1	Confidential Moorland Breeding Bird Survey Results – confidential (see **Appendix 1**)
Figure 6.2	Moorland Breeding Bird Survey Results
Figure 7	Confidential Breeding Raptor Survey Results – confidential (see **Appendix 1**)
Figure 8	Confidential Breeding Diver Survey Results – confidential (see **Appendix 1**)
Figure 9	Black Grouse Survey Results
Figure 10	Confidential Red-throated diver flight lines 2017 – 2019 – confidential (see **Appendix 1**)
Figure 11	Locations of Line Markers

Appendix 2 – Survey Dates and Weather Conditions

Table A2.1 – Vantage Point Survey Dates, Times and Weather Conditions

VP Location	Survey Date	Surveyor	Start Time	End Time	Survey Type	Cloud Cover (Eighths)	Temp (˚C)	Visibility	Wind Speed (Beaufort)	Wind Direction	Precipitation
1	20/04/2021	DP	12:20	15:20	Diurnal	6	4	>2km	5	West North West	None
1	21/04/2021	DP	15:00	18:00	Diurnal	1	5	>2km	1	South East	None
1	22/04/2021	DP	17:50	20:50	Dusk	7	15	>2km	2	North West	None
1	04/05/2021	DP	11:30	14:30	Diurnal	6	4	>2km	6	North	Heavy intermittent
1	04/05/2021	DP	15:00	18:00	Diurnal	7	7	>2km	5	North North West	None
1	27/5/2021	DP	12:20	15:20	Diurnal	6	13	>2km	3	South West	None
1	22/06/2021	BW	09:00	12:00	Diurnal	1	13	>2km	1	South West	None
1	22/06/2021	BW	12:30	15:30	Diurnal	1	14	>2km	3	South West	None
1	20/7/2021	DP	10:15	13:15	Diurnal	6	20	>2km	0	West	None
1	31/08/2021	DP	08:55	11:55	Diurnal	8	13	>2km	4	North	None
1	31/08/2021	DP	12:25	15:25	Diurnal	7	16	>2km	3	North North West	None
2	23/04/2021	DP	07:30	10:30	Dawn	3	6	>2km	2	South East	None
2	29/04/2021	DP	09:30	12:30	Diurnal	6	5	>2km	5	North East	None
2	07/05/2021	BW	09:28	12:28	Diurnal	7	6	>2km	3	North west	None
2	07/05/2021	BW	13:00	16:00	Diurnal	7	5	>2km	4	North West	None
2	26/05/2021	DP	14:00	17:00	Diurnal	8	9	>2km	4	North West	None
2	01/06/2021	DP	11:00	14:00	Diurnal	8	16	>2km	3	South West	None
2	01/06/2021	DP	14:30	17:30	Diurnal	7	17	>2km	3	South	None
2	30/08/2021	BW	09:45	12:45	Diurnal	8	13	>2km	1	East	None
2	30/08/2021	BW	13:15	16:15	Diurnal	8	14	>2km	1	East	None

VP Location	Survey Date	Surveyor	Start Time	End Time	Survey Type	Cloud Cover (Eighths)	Temp (˚C)	Visibility	Wind Speed (Beaufort)	Wind Direction	Precipitation
3	21/06/2021	DP	12:10	15:20	Diurnal	4	18	>2km	3	North	None
3	29/06/2021	BW	10:00	13:00	Diurnal	1	14	>2km	1	North East	None
3	29/06/2021	BW	13:30	16:30	Diurnal	1	15	>2km	1	West	None
3	01/07/2021	BW + JR	09:20	12:20	Dirunal	1	15	>2km	2	South East	None
3	01/07/2021	BW + JR	12:50	15:50	Diurnal	1	16	>2km	2-3	South	None
3	15/07/2021	DP	09:15	15:15	Diurnal	2	17	>2km	2	West	None
3	16/07/2021	JR	10:45	16:45	Diurnal	7	12	>2km	2	South West	None

Table A2.2 Breeding Bird Survey Dates, Times and Weather Conditions

Survey Date	Survey Type	Visit No.	Surveyor	Cloud Cover (Eighths)	Temp (˚C)	Visibility	Wind Speed (Beaufort)	Wind Direction	Precipitation
01/04/2021	MBBS	prelim	BW	1	5	>2km	1	-	None
13/04/2021	MBBS	1	BW	8	10	>2km	2	North West	None
14/04/2021	MBBS	1	BW	3	14	>2km	1	-	None
17/05/2021	MBBS	2	DP	6	12	>2km	2	-	None
18/05/2021	MBBS	2	DP	7	15	>2km	2	East	None
19/05/2021	MBBS	2	DP	8	15	>2km	3	East	None
02/06/2021	MBBS	3	DP/BW	3	16	>2km	3	South	None
03/06/2021	MBBS	3	BW	2	17	>2km	2	South	None
12/07/2021	MBBS	4	DP	8	19	>2km	2	-	None
13/07/2021	MBBS	4	DP	7	18	>2km	3	-	None
01/04/2021	RW	1	BW	3	8	>2km	1	-	None

Survey Date	Survey Type	Visit No.	Surveyor	Cloud Cover (Eighths)	Temp (˚C)	Visibility	Wind Speed (Beaufort)	Wind Direction	Precipitation
12/04/2021	RW	1	BW	2	8	>2km	2	-	None
15/04/2021	RW	1	BW	0	10	>2km	0	-	None
22/04/2021	RW	1	BW	2	13	>2km	0	-	None
30/04/2021	RW	1	DP	5	12	>2km	1	-	None
18/05/2021	RW	2	DP	6	14	>2km	3	South East	Light Intermitant
20/05/2021	RW	2	BW	2	14	>2km	1	North East	Light Intermittent
08/06/2021	RW	3	DP	8	19	>2km	2	South West	None
09/06/2021	RW	3	DP	8	19	1-2km	3	South	Light persistent
07/06/2021	RW	3	DP	5	20	>2km	3	South	None
03/07/2021	RW	4	DP	3	18	>2km	2	South	None
13/07/2021	RW	4	DP	6	20	>2km	1	West	None
16/07/2021	RW	4	BW/DP	0	18	>2km	4	West	None
01/04/2021	BG	1	BW/DP	1	0	>2km	1	-	None
12/04/2021	BG	1	BW	1	1	>2km	1	-	None
23/04/2021	BG	1	BW	3	1	>2km	1	-	None
28/04/2021	BG	2	DP	4	1	>2km	1	-	None
29/04/2021	BG	2	DP	3	1	>2km	1	-	None

Key:
MBBS – Moorland breeding bird survey
RW – Raptor walkover
BG – Black grouse lek survey

Appendix 3 - Highland Raptor Study Group Results

See confidential Appendix 1

Appendix 4– Survey Results

See confidential Appendix 1

Appendix 5 – Policy and Legislation

This section provides an overview of the framework of legislation and policy which underpins nature conservation and is a material consideration in the planning process in Scotland.

Plans and Policy

Scottish Biodiversity Strategy

The Scottish Biodiversity Strategy is constituted by a combination of two documents: 'Scotland's Biodiversity: It's in Your Hands', which was published in 2004, and the '2020 Challenge for Scotland's Biodiversity'; published in 2013. The aims of Scotland's 2020 challenge are to:

1 protect and restore biodiversity on land and in our seas, and to support healthy ecosystems;
2 connect people with the natural world, for their health and well-being, and to involve them more in decision making; and
3 maximise the benefits for Scotland of a diverse natural environment and the services it provides, contributing to sustainable economic growth.

Further information can be found at: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy

Scottish Biodiversity List

The Scottish Biodiversity List (SBL) is a list of animals, plants and habitats considered to be of principal importance for biodiversity conservation in Scotland. Those bird species considered to be potentially relevant to the site are listed in the main text.

Birds of Conservation Concern

The Birds of Conservation Concern 4 (BoCC) (Eaton et al, 2015) categorises bird species into Red, Amber or Green lists depending on their rarity and ultimately conservation concern. Species appearing on the Red List are of the greatest conservation concern, for example those species that have experienced 50% or greater population declines in their breeding or wintering range over 25 years or those classified as Globally Threatened. Amber List species have experienced population declines between 25 and 50% over 25 years or have European Red List status. Green-listed species are of the lowest conservation concern.

Local Biodiversity Action Plan

Local Biodiversity Action Plans (LBAPs) identify habitat and species conservation priorities at a local level (typically County by County) and are usually drawn up by a consortium of local Government organisations and conservation charities. Although they are no-longer managed at a national level many are still reviewed and updated at a local level.

It should be noted that the existence of a Species Action Plan (SAP) or Habitat Action Plan (HAP) does not always infer an elevated level importance for those features. These plans may be designed to encourage an increase in these habitats/species, rather than to protect a county-scarce feature.

General Legislation

The following presents accounts present a summary of the legislation relevant to the breeding birds. It is recommended that the reader also refer to the original legislation for definitive interpretation.

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), henceforth referred to as the Habitats Regulations were the principal means by which the European Union's ECC Directive 92/43 (The Habitats Directive) as amended is transposed into Scottish Law and remain in force after 'Brexit' which took place on 31st December 2020.

Under EU legislation, The Habitats Regulations placed a duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which met the criteria were, in conjunction with the European Commission, designated as Sites of Community Importance, and subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. The regulations also placed a duty upon the government to maintain a register of European protected sites designated as a result of EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, formed the Natura 2000 network of sites.

Post Brexit, European sites are still protected in Scotland and the rest of the UK. The terms "European site", "European marine site", and "European offshore marine site", have been retained, as have "Special Area of Conservation" (SAC) and "Special Protection Area" (SPA). SAC and SPA are no longer part of the European Union's Natura 2000 network. Instead, they form a UK-wide network of protected sites, referred to in the 1994 Regulations as the UK site network, and retain the same protections. The UK site network is made up of SACs and SPAs designated at various points in time before exit day (i.e. UK sites that formed part of the EU's Natura 2000 network prior to exit day), and any sites designated under the Habitats Regulations after exit day.

The Habitats Directive is underpinned by the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of protected areas within the UK site network. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. These provisions, together with the requirement for competent authorities to undertake Habitats Regulations Appraisal (HRA) are unchanged after Brexit.

The Habitats Regulations also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively. These are commonly referred to as European Protected Species and continue to be referred to as such below. Schedule 2 includes species such as otter, great crested newt and most recently beaver for which the Scottish population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations.

It is also an offence under the Habitats Regulations for any person to have in their possession or control, to transport, to sell or exchange, or to offer for sale, any live or dead protected species, part of a protected species or anything derived from a protected species, which has been unlawfully taken from the wild.

The Wildlife and Countryside Act (WCA) 1981

The WCA, as amended, consolidates and amends pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Conservation (Natural Habitats. &c.) Amendment (Scotland) Regulations 2012, offering protection to a wider range of species. The Act also provides for the designation and protection of national conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSIs).

Schedules of the act provide lists of protected species, both flora and fauna, and detail the possible offences that apply to these species. All relevant species-specific legislation is detailed later in this Appendix.

Birds

The Wildlife and Countryside Act (WCA) 1981, as amended, protects all breeding birds in the UK with a few exceptions (i.e. sporting birds listed in Schedule 2 and for certain specified purposes under licence). The WCA makes it an offence to intentionally or recklessly:

4 kill, injure or take a wild bird;
5 take, damage, destroy or interfere with the nest of any wild bird whilst it is in use or being built (or at any time for a nest habitually used by any listed in Schedule A I);
6 obstruct or prevent any wild bird from using its nest;
7 take or destroy an egg of any wild bird;
8 disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young, or whilst lekking; or
9 disturb the dependent young of any wild bird listed on Schedule 1.

Recklessly in this context is to be understood as pursuing a course of action while consciously disregarding the fact that the action gives rise to a substantial and unjustifiable risk.

Schedule 1 is a list of rare breeding species that are specially protected in the UK. Two additional Schedules (Schedule 1A and A1) have been created to afford further protection to some species included on Schedule 1. This additional protection makes it an offence to intentionally or recklessly:

10 at any time, damage, destroy or interfere with any nest habitually used by any wild bird included in Schedule A1; or
11 at any time harass any wild bird included in Schedule 1A.

A total of 105 bird species are listed as SPI on the Scottish Biodiversity List and therefore are a material consideration for Local Planning Authorities (LPAs) during the planning process.