12. Ornithology

12.1 Non-Technical Summary

12.1.1 This Chapter considers the potential effects of the Proposed Development on ornithology. It details the methods used to establish the bird species and populations present, together with the process used to determine their Nature Conservation Importance. The ways in which birds might be affected (directly or indirectly) by the construction and operation of the Proposed Development are explained and an assessment is made with regards the significance of these effects.

12.1.2 The assessment is structured around the consideration of potential effects, including cumulative effects, of construction and operation of the Proposed Development upon those ornithological receptors identified during survey work.

12.1.3 Desk-based studies and field surveys were carried out in and around the Proposed Development over respective 'study areas' to establish baseline conditions and the species and populations present.

12.1.4 It was possible to 'scope out' the effects on a number of species of high Nature Conservation Importance by virtue of their ecology, absence, distance from the Proposed Development, small numbers, low levels of activity and the nature and location of this activity.

12.1.5 Three bird species were included in the assessment, golden eagle, red kite and hen harrier. These species were considered to be of high Nature Conservation Importance due to their listing as Annex I (Birds Directive) and Schedule 1 (Wildlife and Countryside Act 1981, as amended by the Nature Conservation (Scotland) Act 2004).

12.1.6 Habitat loss arising from the construction of tracks, borrow pits and turbine bases is unlikely to result in adverse impacts upon any bird species. Any impacts are likely to be negligible and not significant. Population reductions due to habitat loss, displacement and/or collision mortality are also likely to be minimal. Any impacts are likely to be negligible and not significant for all bird species.

12.1.7 The contribution of adverse effects accrued by the Proposed Development to regional populations would be undetectable and so cumulative effects of the Proposed Development with existing and planned windfarm developments in the region are judged as being unlikely to have a significant effect on existing bird populations. Overall, it is concluded that construction and operation of the Proposed Development would not have a significant effect on birds under the terms of the EIA Regulations.

12.1.8 Information is presented to allow the competent planning authority to consider the requirement for an assessment of potential effects of the Proposed Development on the integrity of a number of Special Protection Areas (SPAs) classified for capercaillie. This information demonstrates that the Proposed Development would not have a likely significant effect on any SPA, therefore further consideration under the Habitats Regulations is not required.

12.2 Introduction

12.2.1 This Chapter of the Environmental Impact Assessment Report (EIA Report) considers the potential impacts of Tom na Clach Wind Farm Extension (the 'Proposed Development') on ornithological features. It summarises the methods used to establish the bird populations within the Site and its surroundings, the results of the baseline surveys, and the process used to determine the sensitivity of the bird populations present. The ways in which birds might be affected (directly or indirectly) by the construction and operation of the Proposed Development are assessed, prior to and after any mitigation measures are considered.

12.2.2 Particular attention has been paid to species of high or moderate Nature Conservation Importance (target species). These include, but are not restricted to, species with national or international protection under the Wildlife and Countryside Act 1981 (and later amendments) and the EU Birds Directive (79/409/EEC).

12.2.3 Birds may be affected by the following phases of the Proposed Development:

- Construction: construction of tracks, turbines and hard standings (including borrow pit operations);
- Operation: turbine operation and associated maintenance activities;
- Decommissioning: the removal of installed structures and reinstatement of habitats where appropriate.

12.2.4 The potential effects of the Proposed Development on birds are:

- direct habitat loss due to land take by wind turbine bases, access tracks and ancillary structures;
- indirect habitat loss due to the displacement of birds as a result of construction and maintenance activities, or due to the presence of the operating wind turbines close to nesting or feeding sites or habitual flight routes;
- disturbance of bird behaviours due to construction and operational effects that do not result in displacement. This may result in reduced productivity and/or survival; and
- collision: the killing or injury of birds following collision with rotating turbine blades and associated structures.

12.2.5 The assessment is based on information available at the time of writing and is supported by:

- **Appendix 12.A**: Report on Ornithological Surveys April 2014 to August 2015;
- **Appendix 12.B**: Report on Ornithological Surveys April 2018 to March 2019;
- **Appendix 12.C**: Collision Risk Modelling Report; and
- **Appendix 12.D**: Confidential Ornithology.

12.2.6 A detailed description of the Proposed Development is presented in **Chapter 3: Description of the Proposed Development**, while the layout of the Proposed Development is illustrated on **Figure 3.1**.

12.2.7 The ornithology impact assessment was undertaken by Natural Research (Projects) Limited (NRP).

12.3 Legislation, Policy and Guidance

Legislation

12.3.1 The following legislation has been considered when undertaking this assessment:

- European Commission (2019a). Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
- European Commission (2019b). Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) ('Habitats Directive');
- European Commission (2019c). Environmental Impact Assessment Directive 2014/52/E;
- Scottish Government (2019a). The Wildlife and Countryside Act 1981 (as amended);
- Scottish Government (2019b). The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- Scottish Government (2019c). The Nature Conservation (Scotland) Act 2004 (as amended); and
- Scottish Government (2017). The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Policy

12.3.2 **Chapter 4 (Policy Context)** of the EIA Report sets out the planning policy framework that is relevant to the Environmental Impact Assessment.

Guidelines

12.3.3 The following guidance has been consulted while undertaking this assessment:

- CIEEM. (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester;
- 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;
- European Commission (2020). Natura 2000 Guidance Document: Wind energy developments and EU nature legislation. European Commission, Brussels;

- Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation; Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds ("the Habitats and Birds Directives"). Revised Guidance Updating Scottish Office Circular No 6/1995;
- Scottish Natural Heritage (SNH) (2000a). Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. SNH Guidance Note;
- Scottish Natural Heritage. (2000b). Natural Heritage Zones;
- SNH (2016a). Assessing connectivity with Special Protection Areas (SPAs). Version 3;
- SNH (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees Version 2;
- SNH (2017). Recommended bird survey methods to inform impact assessment of onshore windfarms;
- SNH (2018a). Assessing the cumulative impacts of onshore wind farms on birds. SNH Guidance Note;
- SNH (2018b). Assessing significance of impacts from onshore wind farms on birds out with designated areas. Version 2;
- SNH (2018c). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland; and
- SNH (2018d). Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model. SNH Guidance Note.

12.4 Scoping Responses and Consultation

12.4.1 Throughout the scoping exercises, and subsequently during the ongoing EIA process, relevant organisations were contacted with regards to the Proposed Development. Requests for Scoping opinions and other consultation were made with NatureScot (formerly Scottish Natural Heritage (SNH)) and the Royal Society for the Protection of Birds (RSPB). **Table 12.1** outlines the consultation responses received in relation to Ornithology.

Table 12.1: Consultation

Consultee	Consultation Response	Applicant Action/Response
NatureScot Scoping Opinion	We advise that the potential for dispersing female and juvenile capercaillie to cross the wind farm site should be considered within the EIAR, in order to determine if there could be a likely significant effect from collision risk, and	Dispersing capercaillie have been considered within the EIA Report chapter. It has been concluded that there is no likely significant effect, and an Appropriate Assessment is not required (see Designated Sites).

Consultee	Consultation Response	Applicant Action/Response
NatureScot Scoping Opinion	whether an Appropriate Assessment is required.	
	We advise that all bird survey work should follow our guidance.	All survey work was undertaken in accordance with relevant NatureScot guidance. (see Appendix 12.A and 12.B)
	Survey and assessment is generally recommended to 6km from the site boundary for this species [golden eagle]. The applicants should ensure their assessment has covered the recommended survey area, either through their own survey work or provision of data from third parties such as the Raptor Study Group.	Surveys for golden eagle were undertaken within 6 km of the Proposed Development in 2014/15 and a breeding site was located (see Appendix 12.A). As the breeding site was known to NRP, and no further breeding sites are located within 6 km, there was no requirement to extend surveys out to 6 km during 2018/19 and the known breeding site was monitored (see Appendix 12.B).
	In terms of scarce breeding birds, red kite surveys are not mentioned in the scoping report and we recommend this point is clarified in the EIAR. Should red kites be affected by this proposal, an assessment of potential impacts on the North Highland population of red kites, both as an individual scheme and in combination with the other renewable energy developments in the area, would be required.	Potential impacts upon red kite have been fully addressed within this chapter.
	Noting the above points and depending on the submission date, it is likely that the ornithological assessment for this site could be informed by the 2018/19 survey work, with the survey work from 2014/15 and other available information (such as survey work for the operational wind farm) provided as context.	Noted.
	Once survey work is complete an assessment of potential impacts through habitat loss/change, disturbance and/or displacement, and collision risk to SPA and wider countryside bird populations will be required, both for the proposal on its own and in combination with other projects. Mitigation options should be considered as part of this process.	Potential impacts upon all bird species have been fully addressed within this chapter.

Consultee	Consultation Response	Applicant Action/Response
NatureScot Scoping Opinion	It would also be helpful for the EIAR to clarify the timing of construction related activities at the operational wind farm, to show that this has not affected survey work undertaken for the extension.	Survey timings are discussed in this chapter (see Survey Limitations).
RSPB Scoping Opinion	The nearest capercaillie SPA (Kinveachy Forest) is given as 11.2km from the site, whilst 4 other capercaillie SPAs are within 20km. There is a possibility, albeit thought to be small, that transiting birds could be impacted by the proposal through collision risk and barrier effects. Therefore, it is advised that impacts on capercaillie SPAs should not scoped out at this stage and further consideration is given to whether there would be likely significant effect on the relevant SPAs. If likely significant effects exist then sufficient information must be provided to allow an Appropriate Assessment to be carried out by the decision maker.	Dispersing capercaillie have been considered within the EIA Report chapter. It has been concluded that there is no likely significant effect, and an Appropriate Assessment is not required (see Designated Sites).
	Any monitoring data available from the operational windfarm should be used to help inform the current application, detailing any results from post-construction monitoring for golden plover and other species.	No monitoring data were available at the time of writing the EIA Report chapter.
	RSPB Scotland would advise inclusion of the Golden Eagle Topographical (GET) model to show areas of high landscape use and if relevant (depending on results of desk based and VP surveys) use of this tool to inform windfarm layout, as well as the Predicting Aquila Territories model should any territories be present.	Golden Eagle Topography (GET) modelling was not required based on empirical, site-based evidence which showed that golden eagle rarely use the Proposed Development site. Use of the Predicting Aquila Territories (PAT) model has been superseded by the GET model due to significant errors in the assumptions made within the PAT model. Therefore, it would be inappropriate to use the results of PAT modelling to inform the assessment.
	The EIA Report should include a full survey, impact assessment and proposals for mitigation in relation to important habitats and species on this site.	The EIA Report chapter and supporting Appendices does this.

Consultee	Consultation Response	Applicant Action/Response
RSPB Scoping Opinion	A Habitat Management Plan was submitted to address a condition of the now operational Tom na Clach Windfarm. It is vital that the current proposal and any associated infrastructure does not impact negatively on these habitat management areas.	The current proposal does not impact negatively on the wader management area due to the separation distance of c.3 km between the current proposal and the wader management area.
	If the proposed development is granted consent and proceeds, the blanket bog restoration area and wader management area should be extended to mitigate for the additional impacts of the proposal.	No significant effects on wader populations were identified, therefore no further mitigation is required.

12.5 Assessment Methodology and Significance Criteria

Scope of Assessment

12.5.1 The methodology comprised the following:

- consultation and desk-based assessment;
- moorland breeding bird survey;
- winter transect survey;
- raptor (birds of prey) survey;
- black grouse survey;
- vantage point (VP) watches;
- collision risk analysis; and
- cumulative assessment.

Study Area

12.5.2 The Study Area was defined with reference to the location of turbines within the Proposed Development and encompasses a series of buffers of up to 2 km radius; with buffer size dependent on the sensitivity of key species to potential effects associated with wind farm development (**Appendix 12.B: Figure 12.1**). The various survey areas, which make up the Study Area, are defined as follows:

- 'Site' refers to the area enclosed by the Proposed Development;
- '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;
- 'flight activity survey area' refers to a polygon drawn round the outermost turbine locations and an additional 500 m wide strip around this polygon;
- 'black grouse survey area' refers to the Site plus an additional 1.5 km wide strip; and
- 'raptor survey area' refers to the site area 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.

12.5.3 The Site is primarily comprised of blanket bog and associated plant communities. Other habitats present within the survey areas for the Proposed Development include dry and modified wet heath, unimproved and semi-improved acid grassland. The wind farm area is currently managed primarily for red grouse and extensive sheep grazing.

Desk-based Study

12.5.4 A desk-based study was undertaken to collate existing bird records/data. Distribution and abundance data were collected from published sources (e.g., Gibbons *et al*., 1993 and Forrester *et al*., 2007) and nature conservation organisations including NatureScot, RSPB, Highlands Raptor Study Group (HRSG) in relation to species with a moderate or high nature conservation value (SNH, 2014; SNH, 2017).

Survey Methodology

12.5.5 Baseline field surveys for the Proposed Development were carried out between April 2014 to August 2015 and April 2018 to March 2019. A detailed methodology for all surveys is provided in **Appendix 12.A** and **12.B** of this EIA Report and is briefly summarised below.

Moorland Breeding Bird Survey

12.5.6 Breeding bird territories were surveyed April to July 2014, 2015 and 2018, within the breeding bird survey area. The Brown & Shepherd (1993) method for upland waders was modified to also provide reliable breeding estimates for moorland passerines by undertaking some surveys during the first few hours of daylight. All target bird species were surveyed. Surveyors conducted four separate "visits" during the survey period. Bird locations and behaviour were plotted onto 1:25,000 scale maps, using the standard Common Birds Census notation. Supplementary behavioural observations and notes were made to determine breeding locations as accurately as possible.

12.5.7 Suitable habitat within the breeding bird survey area was systematically searched for evidence of breeding birds. A survey route was chosen to ensure that all parts of the breeding bird survey area were surveyed to within 100 m of the observer. The surveys were carried out during daylight hours, avoiding strong winds, heavy rain, fog and low cloud. Walking, listening and scanning by eye and with binoculars were the methods used to locate the birds. Particular attention was given to any topographical and vegetation features likely to influence bird distribution. Birds were considered to be breeding if they were observed singing, displaying, carrying nest material, if nests or young were found, or evidence observed of repetitively alarmed adults or disturbance displaying, or birds carrying food or in territorial dispute.

Winter Transect Survey

12.5.8 Winter walkover surveys were utilised to assess the use of the Site by passage and wintering birds, supplementing observations from the flight activity survey. Wintering bird walkover surveys of the core survey area were completed between October 2014 to March 2015 and September 2018 to February 2019.

Scarce Breeding Bird Survey

12.5.9 Detailed surveys for nesting raptors and owls within the raptor survey area were undertaken during the spring/summer 2014, 2015 and 2018. All crags and rock outcrops were systematically searched for evidence of breeding golden eagle, peregrine and merlin. All isolated trees, areas of rank vegetation and woodland edges were also closely observed for signs of breeding hen harrier, merlin, goshawk, osprey and red kite. Extensive areas of open ground were systematically searched for evidence of breeding by ground nesting species such as hen harrier, merlin and short-eared owl.

12.5.10 Systematic searches for potential nest and roost sites of barn owl were undertaken in Summer 2018. Emphasis was placed on searching for birds, nests, pellets, feathers and faecal splash in potentially suitable buildings within 1 km of the Proposed Development.

Black Grouse Survey

12.5.11 Black grouse surveys were undertaken within one hour of dawn during April and May 2015 and 2018, to locate the number and distribution of leks (display areas) within the black grouse survey area. All suitable areas were visited on at least two occasions.

Flight Activity Survey

12.5.12 Vantage point watches were undertaken at three locations from April 2014 until the end of August 2015 and at two locations from April 2018 until end of March 2019 to record the flight behaviour of all key species. These watches totalled a minimum of 72 hours from each vantage point per year. Information was collected during timed watches from these observation points covering the area up to approximately 2 km from any proposed turbine locations. Observations were gathered from locations selected to minimise possible interference with bird movements and behaviour.

12.5.13 Work was undertaken by a single observer per vantage point in conditions of good ground visibility. Normally, each observation period lasted three hours but, if necessary, they were suspended and later resumed to take account of changes in weather. The area in view was scanned constantly until a target species was detected perched or in flight. Once detected, the bird was followed until it ceased flying or was lost from view. The time the bird was first detected, and the duration of the flying period were recorded. The route followed by the bird was plotted in the field onto 1:25,000 scale maps. The bird's flying height was estimated at the point of detection and recorded in 15 second intervals thereafter.

12.5.14 The main aim of the observational work was to collect data for key species that use the flight activity survey area. In addition, details of any migrating swans and geese were recorded if observed. This allowed estimates to be made of the following:

- the time each species spent flying over the study area;
- the relative use each species made of different parts of the study area; and

- the proportion of flying time each species spent at different elevations above the ground.

Survey Limitations

12.5.15 Construction of the operational Tom na Clach Wind Farm took place between June 2016 to end of September 2018. The second year of baseline bird surveys at the Proposed Development were undertaken between April 2018 and March 2019. Therefore, there is considerable overlap between construction activities and the second year of bird surveys, which may have affected survey results. As the magnitude of construction effects are considered greater than those of operational effects, it is likely that during the period April 2018 to September 2018 the results of the bird surveys undertaken are underestimated due to the effects of construction disturbance and displacement. However, this underestimation when considered against the magnitude of operational disturbance/displacement effects will be slight and unlikely to change the conclusions of the assessment.

Assessment Methodology

12.5.16 The assessment follows the process set out in the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations') and Scottish Government guidance on the implementation of the Birds and Habitats Directives. The process of evaluating the effects of the Proposed Development on birds ensures that the consenting authority has sufficient information to determine whether the Proposed Development (either alone or in combination with other plans or projects) is likely to have a significant effect on bird interests.

12.5.17 The assessment determines the potential effects of the Proposed Development and considers the likelihood of their occurrence. Effect is defined as change in the assemblage of bird species present as a result of the impacts accrued by the Proposed Development. Change can occur either during or beyond the life of the Proposed Development. Where the response of a population has varying degrees of likelihood, the probability of these differing outcomes is considered. Note effects can be adverse, neutral or beneficial.

12.5.18 In assessing whether an effect is significant or not, three factors are considered:

- the Nature Conservation Importance of the species involved,
- the magnitude of the likely effect, and
- the conservation status of the species.

12.5.19 The significance of potential effects is then determined by integrating the assessments of these factors in a reasoned way. The magnitude of likely effects involves consideration of their spatial and temporal magnitudes. In making judgements on significance by this integration, consideration is given to the national and regional trends of the potentially affected species, and how the integrated effects may impinge on the conservation status of the species involved at these geographical levels. Further details of the process underlying the assessment and the determination of significance follow.

Nature Conservation Importance

12.5.20 The Nature Conservation Importance of each species potentially affected by the Proposed Development was defined according to **Table 12.2**.

Table 12.2: Nature Conservation Importance

Importance	Definition
High	Species listed in Annex 1 of the EU Birds Directive.
	Breeding species listed on Schedule 1 of the WCA.
Moderate	Species on the BoCC 'Red list' (Eaton *et al*., 2015) or IUCN Red List of Threatened Species (IUCN, 2021).
	Regularly occurring migratory species, which are either rare or vulnerable, or warrant special consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas in relation to the Proposed Development.
	Species present in regionally important numbers (>1 % regional population).

12.5.21 Species listed in Local Biodiversity Action Plans (LBAPs) would be considered moderately important only if the Proposed Development supported as least 1% of the regional population.

12.5.22 All other species are considered of low Nature Conservation Importance and are not considered further in this assessment.

Magnitude of Effect

12.5.23 Magnitude was determined by consideration of the spatial and temporal nature of each potential effect. There are five levels of spatial magnitude (**Table 12.3**) and four levels of temporal magnitude (**Table 12.4**). In the case of non-designated sites, spatial magnitude was assessed in respect of populations within the appropriate ecological unit; in this case the appropriate unit is taken to be the Central Highlands Natural Heritage Zone (NHZ 10), as defined by NatureScot (SNH, 2000b).

Table 12.3: Levels of Spatial Magnitude

Magnitude	Definition
Very High	Total/near total loss of a bird population due to mortality or displacement. Total/near total loss of productivity in a bird population due to disturbance. Guide: > 80 % of regional population affected.
High	Major reduction in the status or productivity of a bird population due to mortality, displacement or disturbance. Guide: 21-80 % or regional population affected.
Moderate	Partial reduction in the status or productivity of a bird population due to mortality, displacement or disturbance. Guide: 6-20 % of regional population affected.
Low	Small but discernible reduction in the status or productivity of a bird population due to mortality, displacement or disturbance.

Magnitude	Definition
	Guide: 1-5 % of the regional population affected.
Negligible	Very slight reduction in the status or productivity of a bird population due to mortality, displacement or disturbance. Reduction barely discernible, approximating to the 'no change' situation. Guide: < 1 % of regional population affected.

Table 12.4: Levels of Temporal Magnitude

Magnitude	Definition
Permanent	Impacts continuing indefinitely beyond the span of one human generation (taken as approximately 25 years), except where there is likely to be substantial improvement after this period (e.g., the replacement of mature trees by young trees which need > 25 years to reach maturity, or restoration of ground after removal of a development). Such exceptions can be termed very long effects.
Long-term	Approximately 15-25 years or longer (refer to above).
Medium-term	Approximately 5-15 years.
Short-term	Up to approximately 5 years.

12.5.24 The magnitude of an effect can be influenced by when it occurs. For example, operations undertaken in daylight hours may have little temporal overlap with the occupancy of birds' night-time roosts; and seasonality in a bird population's occupancy of a site may mean that impacts are unlikely during certain periods of the year.

12.5.25 A population's behavioural sensitivity may also be considered when assessing the magnitude of effects. Behavioural sensitivity may be judged as being high, moderate or low according to the species' ecological function and behaviour. Behavioural sensitivity can differ even between similar species and, for a particular species, some populations and individuals may be more sensitive than others, and sensitivity may change over time, e.g. species are often more sensitive during the breeding season.

12.5.26 Importantly, in determining sensitivity and its contribution to an effect, where such information exists from monitoring sites, data on the responses of individual birds and bird populations to wind farms and similar developments are taken into account, along with knowledge of how rapidly the population or performance of a species is likely to recover following loss or disturbance (e.g. birds being recruited from other populations elsewhere).

Conservation Status

12.5.27 Where the available data allowed, the conservation status of each potentially affected population was considered within the NHZ. For these purposes, conservation status was taken to mean the sum of the influences acting on a population which may affect its long-term distribution and abundance. Conservation status is considered to be favourable where:

- a species appears to be maintaining itself on a long-term basis as a viable component of its habitats,
- the natural range of the species is not being reduced, nor is likely to be reduced for the foreseeable future; and
- there is (and will probably continue to be) sufficient habitat to maintain the species' population on a long-term basis.

Determining Significance of Potential Effects

12.5.28 Following the classification of each species' Nature Conservation Importance and consideration of the magnitude of each effect, professional judgement is used to make a reasoned assessment of the likely effect on the conservation status of each potentially affected species.

12.5.29 In accordance with the EIA Regulations, each likely effect is evaluated and classified as either significant or not significant. The significance levels of effect on bird populations are described in **Table 12.5**. Detectable changes in the conservation status of regional populations of Nature Conservation Importance are automatically considered to be significant effects for the purposes of the EIA Regulations (i.e., no distinction is made between effects of "major" or "moderate" significance). Non-significant effects include all those which are likely to result in barely detectable (minor) or non-detectable (negligible) changes in conservation status of regional (and therefore national) populations. If a potential effect is determined to be significant, measures to avoid, reduce or remedy the effect are suggested wherever possible.

Table 12.5: Significance levels of effects on birds

Significance Level of effect	Description
Major	Detectable changes in regional populations of Nature Conservation Importance that would have a severe impact on conservation status.
Moderate	Detectable changes in regional populations of Nature Conservation Importance that would likely have an impact on their conservation status.
Minor	Small or barely discernible changes that would be unlikely to have an impact on the conservation status of regional populations of Nature Conservation Importance
Negligible	No or non-detectable changes in the conservation status of regional populations of Nature Conservation Importance.

Assessment Limitations

12.5.30 No significant information gaps were identified.

Embedded Mitigation Measures

12.5.31 The following considerations relating to ornithological interests were incorporated into the Proposed Development design:

- a Bird Protection Plan (BPP), devised in consultation with NatureScot, would be in place prior to the onset of construction activities. The BPP would describe survey methods for the identification of sites used by

protected birds and will detail protocols for the prevention, or minimisation, of disturbance to birds as a result of activities associated with the Proposed Development. The BPP would be overseen by the Ecological Clerk of Works. The BPP would describe surveys to locate the nests or other key sites (e.g., roosts) of birds listed in Schedules 1 and 1A of the WCA 1981, in advance of construction works progressing within the Site. In the event that an active nest or roost of a Schedule 1 or Schedule 1A species is discovered within distances given by Whitfield *et al.* (2008) (or within a 500 m radius of the nest for Schedule 1 species not listed), a disturbance risk assessment will be prepared under the BPP and any measures considered necessary to safeguard the breeding attempt or roost (e.g., exclusion zones or restrictions on timing of works), would be submitted to NatureScot for agreement before recommencing work. Similarly, although the species is not listed on Schedule 1, surveys to locate black grouse lek sites would be undertaken and appropriate measures to safeguard relevant lek sites would be agreed with NatureScot and included within the BPP.

12.6 Baseline Conditions

Designated sites

12.6.1 The Site is not located within or adjacent to any statutory sites designated for ornithological interest. Statutory designated sites for ornithological interest within 20 km of the Site are shown in **Table 12.6**.

Table 12.6: Designated sites within 20 km of the Proposed Development

Name	Designation	Designated for	Distance from Site boundary
Kinveachy Forest	SPA	Capercaillie Scottish Crossbill	11.2 km south
	SSSI	Breeding bird assemblage	11.2 km south
Darnaway and Lethen Forest	SPA	Capercaillie	15.7 km north-east
Loch Vaa	SPA/SSSI	Slavonian grebe	16.2 km south
Abernethy Forest	SPA	Capercaillie Osprey Scottish crossbill	16.5 km south
	SSSI	Capercaillie Osprey Scottish crossbill Crested tit Breeding bird assemblage	16.5 km south
Anagach Woods	SPA	Capercaillie	17.1 km south-east
Loch Flemington	SPA/SSSI	Slavonian grebe	17.3 km north

Name	Designation	Designated for	Distance from Site boundary
Craigmore Wood	SPA	Capercaillie	17.4 km south-east
Inner Moray Firth	SPA/SSSI	Bar-tailed godwit Common tern Greylag goose Osprey Red-breasted merganser Redshank Scaup Waterfowl assemblage	18.7 km north-west

12.6.2 The Inner Moray Firth SPA is located 18.7km from the Site boundary; it is classified for a number of breeding coastal species with only greylag goose and osprey being of interest in this instance due to their inland feeding habits. Following current NatureScot guidance (SNH, 2016) on the connectivity of SPA populations with supporting habitats in the wider environment, the distance to the Inner Moray Firth SPA is greater than the reported connectivity distance for greylag goose and osprey. Therefore, no effects are predicted, and the Inner Moray Firth SPA is not considered further in this Chapter.

12.6.3 Loch Vaa SPA and Loch Flemington SPA are located greater than 16km from the Site boundary and are both designated for their breeding populations of Slavonian grebe. As the Site is located in habitats intrinsically unsuitable for Slavonian grebe, there are no known or historic breeding sites are located within the vicinity of the Site and it is highly unlikely that Slavonian grebe will pass through the Site to reach their breeding grounds then no effects are predicted. As such, the Loch Vaa SPA and Loch Flemington SPA are not considered further in this Chapter.

12.6.4 Scottish crossbill is a qualifying interest for the Kinveachy Forest SPA and Abernethy SPA. As the habitats within the Site are intrinsically unsuitable for Scottish crossbill no effects are predicted and Scottish crossbill is not considered further in this Chapter. Similarly, osprey is a qualifying interest for the Abernethy SPA, however as the distance between the Site and the SPA is greater than the reported connectivity distance for osprey no effects are predicted.

12.6.5 Kinveachy Forest SPA, Darnaway and Lethen Forest SPA, Abernethy SPA, Anagach Woods SPA and the Craigmore Wood SPA are all classified for their breeding populations of capercaillie. Due to their relatively heavy body weight and proportionally small wing size capercaillie are considered "poor flyers" (Rayner, 1988), and inter-patch movements mostly occur in a stepwise manner. As such capercaillie will maximise the efficiency of flights by undertaking a series of short flights utilising the most energy efficient routes using woodland as corridors and 'stepping-stones'. Capercaillie dispersal has been shown to be affected by landscape features, with open areas, roads and settlements reducing the probability of inter-patch dispersal (Braunisch *et al.*, 2010). Therefore, as the Site is:

- located away from the core population of capercaillie, predominantly sited to the north and west of the SPAs;
- not positioned directly between SPAs classified for capercaillie;
- located in habitat intrinsically unsuitable for capercaillie;
- surrounded by expansive intervening open habitats between the Site and the SPAs; and
- not connected by woodland corridors or stepping-stones to aid dispersal towards the Site.

12.6.6 It would be most unlikely that capercaillie would attempt to navigate open moorland when there are more accessible, 'safer in woodland' and energetically less costly options available. It is far more likely that any dispersal movements by capercaillie would remain within the afforested river valleys; as shown by Fletcher & Baines (2020).

12.6.7 Based on knowledge of capercaillie flight behaviour and their current distribution, there is no reason to suppose, on many lines of evidence, that any capercaillie flight traffic would involve the Proposed Development site. This is further supported by the fact that during 51 months of baseline survey for the consented scheme and the current proposal no evidence of capercaillie was recorded[1]. Therefore, as no effects are predicted, capercaillie is not considered further in this Chapter.

12.6.8 As such, there are considered to be no SPAs that warrant further consideration within the EIA, therefore they are scoped out of the assessment.

Field Survey

Wildfowl

12.6.9 During the 2014/15 surveys, nine flights of greylag goose, involving 165 birds, and eighteen flights of pink-footed goose, involving 1,176 birds, were recorded during the survey period. Three flights by unidentified grey geese, involving 52 birds, were also recorded (**Appendix 12.A**).

12.6.10 During the 2018/19 surveys no wildfowl species of conservation concern were recorded during the survey period. Wildfowl records were limited to a single greylag goose flight (**Appendix 12.B**).

12.6.11 There are no wintering areas in the vicinity and low migratory traffic was recorded relative to the known volume of movements by these species. Therefore, there is no requirement for a more detailed assessment and wildfowl are not considered further in this Chapter of the EIA Report.

Waders

12.6.12 During the 2014/15 surveys two species of wader of conservation concern were recorded within the breeding bird survey area: golden plover and curlew (**Appendix 12.A**).

[1] Baseline surveys conducted for the consented scheme and the current proposal were undertaken during September and October 2005, April to July 2006, April 2008 to July 2009, April 2014 to August 2015 and April 2018 to March 2019, totalling 51 months of survey.

12.6.13 During the 2018/19 surveys three species of wader of conservation concern were recorded during the study period: golden plover, curlew and dunlin (**Appendix 12.B**).

Golden plover

12.6.14 Golden plover was recorded regularly during the each of the breeding seasons but only very occasionally during the non-breeding season. The majority of records made were of one or two individuals. In 2014 and 2015, no breeding territories were found within 500 m of the Site. In 2018, three breeding territories were confirmed within the 500 m buffer of the Site.

12.6.15 During the 2014/15 flight activity surveys, 15 flights by golden plover were recorded. Of these, ten flights passed within the flight activity survey area at heights between less than 10 m and 150 m above ground level.

12.6.16 During the 2018/19 flight activity surveys, a single flight by golden plover was recorded, involving two individuals. The flight was recorded as being between 50 m and 100 m in height but did not pass through the flight activity survey area.

12.6.17 Despite golden plover being a species of high Nature Conservation Importance (**Table 12.2**), due to the low numbers and very low level of flight activity within the survey buffers coupled with measures set out in the BPP (see **Embedded Mitigation Measures**) there is no possibility that any potential effects will be significant under the EIA Regulations therefore golden plover is not considered further in this Chapter of the EIA Report.

Curlew

12.6.18 Curlew was recorded regularly during the three breeding seasons. In 2014, no curlews were breeding within 500 m of the Site. In 2015, one pair of curlew was recorded breeding within 500 m of the Site. In 2018, a pair of curlew were holding territory within the 500 m buffer of the Site but no nest site was found.

12.6.19 During the 2014/15 flight activity surveys, 37 flights by curlew were recorded. Of these, nine flights passed within the flight activity survey area at heights between less than 10 m and 100 m above ground level.

12.6.20 During the 2018/19 flight activity surveys eight flights were recorded, involving eleven individuals. Of these, four flights passed within the flight activity survey area at heights between less than 10 m and 50 m above ground level.

12.6.21 Despite curlew being a species of moderate Nature Conservation Importance (**Table 12.2**), due to the low numbers and low level of flight activity within the survey buffers coupled with measures set out in the BPP (see **Embedded Mitigation Measures**) there is no possibility that any potential effects will be significant under the EIA Regulations therefore curlew is not considered further in this Chapter of the EIA Report.

Dunlin

12.6.22 Dunlin was recorded on two occasions during the study period. On 29 April 2014 a single bird was seen in flight. On 8 May 2018 a pair were located and were probably breeding beyond the 500 m buffer of the Site. No flights were recorded during flight activity surveys. Despite being a species of high Nature

Conservation Importance (**Table 12.2**) due to the very low numbers and no flight activity within the survey buffers coupled with measures set out in the BPP (see **Embedded Mitigation Measures**) there is no possibility that any potential effects will be significant under the EIA Regulations therefore dunlin is not considered further in this Chapter of the EIA Report.

Scarce raptors and owls

12.6.23 Nine species of scarce raptor were recorded during surveys: golden eagle, white-tailed eagle, rough-legged buzzard, red kite, osprey, peregrine, hen harrier, goshawk and merlin. Two species of scarce owl were recorded during surveys: short-eared owl and barn owl (**Appendix 12.A** and **12.B**).

Golden eagle

12.6.24 Golden eagle was present throughout the study period and was recorded in flight in and around the Site. An historic breeding site is located adjacent to the Site boundary.

12.6.25 During the 2014/15 study period no breeding behaviour was observed, and the substantial majority of observations were of immature or sub-adult birds. Thirty-seven flights by golden eagle were recorded during flight activity surveys, of which ten passed within the flight activity survey area for a duration of 508 seconds. Of this duration 357 seconds (70 %) was spent between 10 m and 150 m above ground level.

12.6.26 In 2018 the territory was occupied by an immature pair and nest building was recorded, however by June 2018 it was clear that if a breeding attempt had been made it had failed. Four flights by golden eagle were recorded during flight activity surveys for a total duration of 337 seconds. Of this duration 192 seconds (57 %) was spent between 10 m and 150 m above ground level, however no flights passed within 500 m of the proposed turbine locations. Golden eagle is a species of high Nature Conservation Importance (**Table 12.2**).

White-tailed eagle

12.6.27 White-tailed eagle was recorded once during the study period. The record involved an immature bird, seen on 12 July 2018, and was presumed to be a transient individual. No flights were recorded during flight activity surveys. Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the very low numbers and no flight activity within the survey buffers there is no possibility that any potential effects will be significant under the EIA Regulations therefore white-tailed eagle is not considered further in this Chapter of the EIA Report.

Rough-legged buzzard

12.6.28 Rough-legged buzzard was recorded on two occasions in December 2014. As this species is an unusual passage migrant, occurring in Scotland as a vagrant, rough-legged buzzard is not considered further in this Chapter of the EIA Report.

Red kite

12.6.29 Red kite was observed regularly during the study period with the majority of observations being made in the breeding season. No evidence of breeding by

red kite was obtained during baseline surveys, despite extensive searches in potential breeding habitat.

12.6.30 During the 2014/15 study period, red kite was recorded on 57 occasions. Forty flights were recorded during flight activity surveys, of which 26 flights passed within the flight activity survey area for a total duration of 3,748 seconds. Of this duration 3,105 seconds (83 %) was spent between 10 m and 150 m above ground level.

12.6.31 During the 2018/19 study period, twenty-seven flights by red kite were recorded during flight activity surveys. A total duration of 4,333 seconds of flight activity was recorded. Thirteen flights passed within 500 m of the proposed turbine locations for a duration of 1,344 seconds, of which 1,059 seconds (79 %) was spent between 10 m and 150 m above ground level. Red kite is a species of high Nature Conservation Importance (**Table 12.2**).

Osprey

12.6.32 Osprey was recorded on eight occasions during the study period: once in 2014, five times in 2015 and twice in 2018. No evidence of breeding by osprey was obtained during baseline surveys. Two flights were recorded during flight activity surveys, both in 2015. One flight passed within the flight activity survey area for a total duration of 151 seconds, all of which was spent between 10 m and 150 m above ground level. Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the very low numbers and very low flight activity within the survey buffers there is no possibility that any potential effects will be significant under the EIA Regulations therefore osprey is not considered further in this Chapter of the EIA Report.

Peregrine

12.6.33 Peregrine was recorded regularly during the study period. In 2014 and 2015, no confirmed breeding sites were located, however a roost site was found including prey remains, droppings and feathers of juvenile peregrine. In 2018, a possible breeding site was located; however due to its location in a steep-sided gorge it was not possible to confirm.

12.6.34 During the 2014/15 study period, peregrine was observed on 23 occasions. Ten flights were recorded during flight activity surveys, of which three flights passed within the flight activity survey area for a duration of 109 seconds. Of this duration 93 seconds (85 %) was spent between 10 m and 150 m above ground level.

12.6.35 During the 2018/19 study period, one flight by two peregrines was recorded during flight activity surveys but did not pass within 500 m of the proposed turbine locations. A total duration of 4 seconds of flight activity was recorded, all of which was spent below 10 m in height.

12.6.36 Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the low numbers and very low level of flight activity within the survey buffers coupled with measures set out in the BPP (see **Embedded Mitigation Measures**) there is no possibility that any potential effects will be significant under the EIA Regulations therefore peregrine is not considered further in this Chapter of the EIA Report.

Hen harrier

12.6.37 Hen harrier was observed regularly during the study period with the majority of observations being made in the 2018 breeding season. No evidence of breeding within 2 km of the Site was recorded in 2014 or 2015 despite extensive searches in suitable habitat. Evidence of breeding was recorded at three locations in 2018, however only one was within 2 km from the Site.

12.6.38 During the 2014/15 study period, hen harrier was observed on 24 occasions. Thirteen flights were recorded during flight activity surveys, of which six passed within the flight activity survey area for a duration of 456 seconds. Of this duration 232 seconds (51 %) was spent between 10 m and 150 m above ground level.

12.6.39 During the 2018/19 study period, seven flights by hen harrier were recorded during flight activity surveys for a total duration of 346 seconds. Three flights passed within the flight activity survey area for a duration of 144 seconds, of which 20 seconds was spent at heights greater than 10 m above ground level. The majority of the flight duration, 124 seconds (86 %), was spent below 10 m in height and not at potential collision risk height. Hen harrier is a species of high Nature Conservation Importance (**Table 12.2**).

Goshawk

12.6.40 Goshawk was recorded on two occasions during the 2014/15 and 2018/19 study periods. An adult female was observed on 13 July 2018 and an adult male was observed on 17 January 2019. No evidence of breeding by goshawk was obtained during baseline surveys. No flights were recorded during flight activity surveys. Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the very low numbers and no flight activity within the survey buffers there is no possibility that any potential effects will be significant under the EIA Regulations therefore goshawk is not considered further in this Chapter of the EIA Report.

Merlin

12.6.41 Merlin was recorded regularly during the study period with the majority of observations being made in the 2015 breeding season. In 2014, no evidence of breeding was recorded despite extensive searches in suitable habitat. In 2015, one breeding site was located fledging two chicks. In 2018, evidence of breeding by merlin was obtained at one location at a distance greater than 2 km from the Site.

12.6.42 During the 2014/15 study period, merlin was observed on 38 occasions, of which 29 observations were made in 2015. Eight flights were recorded during flight activity surveys, of which four passed within the flight activity survey area for a duration of 111 seconds. Of this duration 85 seconds (77 %) was spent between 10 m and 150 m above ground level.

12.6.43 During the 2018/19 study period, three flights by merlin were recorded during flight activity surveys, of which one flight passed within the flight activity survey area for a duration of 10 seconds; all of which was below 10 m in height.

12.6.44 Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the low numbers and low level of flight activity within the survey buffers

coupled with measures set out in the BPP (see **Embedded Mitigation Measures**) there is no possibility that any potential effects will be significant under the EIA Regulations therefore merlin is not considered further in this Chapter of the EIA Report.

Short-eared owl

12.6.45 During the 2014/15 study period, short-eared owl was recorded on sixteen occasions, all of which were during the 2014 breeding season. No evidence of breeding was recorded despite extensive searches in suitable habitat. Seven flights were recorded within the flight activity survey area for a total duration of 521 seconds; of which 519 seconds was below 10 m in height.

12.6.46 During the 2018/19 study period, short-eared owl was recorded on two occasions. No evidence of breeding by short-eared owl was obtained within the 2 km buffer during baseline surveys; however, breeding was suspected at one location beyond the 2 km buffer. No flights were recorded during flight activity surveys.

12.6.47 Despite being a species of high Nature Conservation Importance (**Table 12.2**) due to the very low numbers and all flight activity within the survey buffers being below collision risk height there is no possibility that any potential effects will be significant under the EIA Regulations therefore short-eared owl is not considered further in this Chapter of the EIA Report.

Barn owl

12.6.48 Barn owl is a species of high Nature Conservation Importance (**Table 12.2**). However, it is also very tolerant of human activities and so potential for disturbance impact during construction, operation and decommissioning is intrinsically low. A successful breeding attempt was recorded during the study period. An adult and three juveniles were observed on 22 June 2018. However, the nest site (and associated foraging ranges: Bunn *et al*., 1982) is not within a distance at which any substantive disturbance could occur as a result of the Proposed Development, regardless of any habitat modifications connected with the Proposed Development. Moreover, barn owls generally fly below collision risk height when foraging, so potential for collision is also low. Therefore, as barn owls would not be adversely affected by the Proposed Development, this species is not considered further in this Chapter of the EIA Report.

Black grouse

12.6.49 No black grouse were recorded within the Site or study area during the study period. Targeted surveys for 'lekking' (displaying) birds in April and May 2015 and 2018, did not locate any lekking birds. No flights were recorded during flight activity surveys. Black grouse, a species of moderate Nature Conservation Importance, is not considered further in this Chapter of the EIA Report.

Other species

12.6.50 All of the open-ground passerine species are regionally widespread and common. The changes induced by the Proposed Development will be largely immaterial in terms of the regional effects on the conservation status of passerine birds. In view of their local numbers relative to wider abundance, and the low sensitivity

of such passerines to the impacts of wind farms, these species are not considered further in this Chapter of the EIA Report.

12.7 Assessment of Potential Effects

Effects Scoped Out

12.7.1 On the basis of the desk study and field survey work undertaken, the professional judgement of the ornithology team, experience from other relevant projects, consultations and taking account of policy guidance, the following topic areas have been scoped out of the assessment:

- Effects on internationally and nationally designated sites: the distance to the nearest SPAs and SSSIs and the species' ecology and biology of the qualifying interests are such that no species cited in the designations for these areas will be affected by the Proposed Development.
- Effects on the following bird populations: wildfowl, waders, white-tailed eagle, rough-legged buzzard, osprey, peregrine, goshawk, merlin, short-eared owl, barn owl, black grouse and passerines. Baseline field studies recorded very infrequent use of the area near the Proposed Development site by these species or species groups. Although these species or species groups were present, they were recorded infrequently, and in relatively small numbers (**Appendix 12.A** & **12.B**). Hence, their reliance on habitats (e.g., for breeding, roosting or foraging) and airspace in the vicinity of the Proposed Development was clearly very low, and the Proposed Development will have negligible effects on relevant populations of these species or species groups. Consequently, given regional abundance and/or behavioural sensitivity there is considered to be no potential for any adverse effect on regional populations as a result of construction, operational or decommissioning activities (see **Baseline Conditions**).
- Effects on all bird species classified as of low Nature Conservation Importance.

12.7.2 Potential effects are evaluated in respect of species of high or moderate Nature Conservation Importance (**Table 12.7**). Emphasis is given to species identified as sensitive receptors. In considering the Nature Conservation Importance of potentially affected species, consideration has been given to the criteria in **Table 12.2**. The types of potential effects resulting from the Proposed Development on birds are detailed in Paragraph 12.2.4.

Table 12.3: Nature Conservation Importance of Potentially Affected Species

Importance	Species
High	Golden eagle, red kite, hen harrier
Moderate	N/A
Low	N/A

Potential Construction Impacts

Disturbance of Breeding Birds

12.7.3 Construction of the Proposed Development is anticipated to last for approximately 14 months. Disturbance from construction will therefore potentially affect two bird-breeding seasons (March-August). Construction activity could result in unpredictable disturbance by personnel and machinery to specific areas of the Site. The result may be a reduction in breeding success, changes in range use or temporary or permanent displacement of individual birds.

12.7.4 Disturbance distances for various breeding birds have been reviewed by NatureScot (Ruddock & Whitfield, 2007; Whitfield *et al*., 2008). The relevant distances in relation to the Proposed Development are:

- a minimum disturbance-free distance of 1500 m is recommended for breeding golden eagle
- a minimum disturbance-free distance of 500 m is recommended for breeding hen harrier, and
- a minimum disturbance-free distance of 150 m is recommended for breeding red kite.

12.7.5 No breeding golden eagle, hen harrier or red kite were located near to proposed turbine locations, access tracks, borrow pits or areas where operating machinery is likely. No disturbance impacts from the working of borrow pits are predicted. While the potential for short-term temporal and low spatial magnitude impacts exists, on balance, the construction effects on breeding golden eagle, hen harrier and red kite are deemed to be negligible and not significant under the EIA regulations.

Disturbance to Foraging Birds

12.7.6 Foraging golden eagle, hen harrier and red kite would be potentially displaced from localised areas around the operational borrow pits and construction sites such as the turbine bases, access tracks, lay-down areas and substation. However, these species have large foraging ranges relative to the scale of any displacement. Moreover, there is no evidence to suggest that the localised areas around the construction work sites are critical to the performance of these species (*i.e.* foraging habitat does not appear to be limiting for the species in question, and there is no reason to believe that the potential displacement area provides unusually profitable foraging opportunities). During the non-breeding period, when foraging birds are not constrained by nest site location, it is considered reasonable to assume they would accommodate any displacement by more intensively exploiting less disturbed areas.

12.7.7 Therefore, although golden eagle, hen harrier and red kite are of high Nature Conservation Importance (**Table 12.2**), they will be essentially behaviourally insensitive to the potential adverse effects of construction activities (that are intrinsically short term: **Table 12.4**), and so the magnitude of spatial effects will be negligible (**Table 12.3**), at worst. Consequently, the level of effect on these species during construction is assuredly negligible (**Table 12.5**), and thereby

the effects are judged to be not significant under the terms of the EIA Regulations.

Direct Habitat Loss

12.7.8 As set out in Chapter 3: Description of the Proposed Development, the construction of turbine bases, access tracks, borrow pits and other associated infrastructure will result in a permanent direct loss of approximately 52.38 ha of habitat. This habitat loss is very small and considered of negligible ornithological significance at the scale of the Central Highlands NHZ. The effect of this habitat loss is spatially negligible in relation to the home range requirements of all potentially affected species. Hence, there will be no change in the conservation status of potentially affected species as a result of habitat loss and the effects of direct habitat loss on all ornithological interests are deemed negligible and not significant under the EIA Regulations.

Potential Operational Impacts

Displacement

12.7.9 Golden eagle, hen harrier and red kite were not recorded as breeding at distances at which operational displacement could potentially constitute an adverse effect. Furthermore, the Proposed Development is clearly not critical to the requirements of foraging golden eagle, hen harrier or red kite; as despite observation effort being high, flight activity levels and sightings were low. Even if operational displacement of foraging birds does occur, the very low baseline flight activity of these species within the Site indicates that it will have minimal local adverse effects on the profitability of foraging and indiscernible effects on regional populations. The magnitude of operational disturbance effects on these diurnal raptors, species of high Nature Conservation Importance, is considered to be negligible. These effects are not deemed to be significant under the terms of the EIA Regulations.

Collision Risk

12.7.10 The main potential operational impacts of wind farms on birds are considered to be mortality through collision with turbine blades.

12.7.11 Flight activity by golden eagle, hen harrier and red kite was recorded within the 500 m buffer of the Proposed Development (**Appendix 12.A: Figures 8.6** and **8.7**; **Appendix 12.B: Figures 5**, **6** and **7**). Collision risk assessments were calculated for these species (**Appendix 12.C**).

Golden eagle

12.7.12 The speed used in the collision risk calculations was 14.1 m / sec for golden eagle. Collision risks have been calculated assuming 99 % avoidance for golden eagle (SNH, 2018d). Full details of the calculations are shown in **Appendix 12.C**.

12.7.13 On the basis of applying an accepted avoidance rate 99 % avoidance, this equates to one bird colliding with a turbine approximately every 85 years (approximately 0.47 birds over the 40-year life of the Proposed Development).

12.7.14 The golden eagle population numbers approximately 12 breeding pairs in the Central Highlands NHZ (Wilson *et al*., 2015). The potential loss of one golden

eagle every 85 years is of negligible magnitude, and the overall effect at the scale of the NHZ would be negligible. This effect is considered not significant in terms of the EIA Regulations, and the population would maintain favourable conservation status.

Hen harrier

12.7.15 The speed used in the collision risk calculations was 11.4 m / sec for hen harrier. Collision risks have been calculated assuming 99 % avoidance for hen harrier (SNH, 2018d). Full details of the calculations are shown in **Appendix 12.C**.

12.7.16 On the basis of applying an accepted avoidance rate 99 % avoidance, this equates to one bird colliding with a turbine approximately every 166 years (approximately 0.24 birds over the 40-year life of the Proposed Development).

12.7.17 The hen harrier population numbers approximately 18 breeding pairs in the Central Highlands NHZ (Wilson *et al*., 2015). The potential loss of one hen harrier every 166 years is of negligible magnitude, and the overall effect at the scale of the NHZ would be negligible. This effect is considered not significant in terms of the EIA Regulations, and the population would maintain favourable conservation status.

Red kite

12.7.18 The speed used in the collision risk calculations was 12.1 m / sec for red kites. Collision risks have been calculated assuming 99% avoidance for red kites (SNH, 2018d). Full details of the calculations are shown in **Appendix 12.C**.

12.7.19 On the basis of applying an accepted avoidance rate of 99%, this equates to one bird colliding with a turbine approximately every 9 years (approximately 4.6 birds over the 40-year life of the Proposed Development).

12.7.20 Red kites were re-introduced to the Black Isle (Rossshire) between 1989 and 1994 and have expanded to a breeding population in excess of 100 pairs by 2015. Productivity is high with 1.9 fledged young per successful pair and at least 72 young were produced in 2019 from 41 monitored nest sites (Challis *et al*., 2020). Despite the ongoing effects of persecution, this population has favourable conservation status.

12.7.21 Sansom *et al.* (2016) showed that the loss of three adult red kite per year would have a negligible effect on the North Highland population trajectory. Indeed, the loss of ten adult birds per year did not cause the population to go into decline. Therefore, the potential loss of one red kite every 8.7 years is of negligible magnitude, and the overall effect at the scale of the NHZ would be negligible. This effect is considered not significant in terms of the EIA Regulations, and the population would maintain favourable conservation status.

Potential Decommissioning Impacts

12.7.22 Habitat reinstatement requirements would be set out in consultation with the statutory authorities at the time of decommissioning. Turbines will be removed at the end of the operational phase (40 years), with foundations removed to 1 m below ground level as part of site restoration. Disturbance effects due to decommissioning would last for a shorter time and be of lower intensity than during construction, and so effects would be similar in nature but of lower magnitude during decommissioning. If decommissioning is to occur during times

of the year when breeding birds might be affected, best practice measures, like those used during construction, will be put into place. These measures will include searches for nesting Schedule 1 bird species.

12.7.23 The magnitude of decommissioning effects on all species is considered to be negligible. Even in the case of species of highest Nature Conservation Importance (**Table 12.7**) these effects are judged as being highly unlikely to be significant under the terms of the EIA Regulations.

12.8 Assessment of Cumulative Effects

12.8.1 The EIA Regulations require the cumulative effects of the Proposed Development with other relevant projects or plans to be assessed. NatureScot guidance (SNH, 2018a) on assessing cumulative effects has been followed. In considering cumulative effects, it is necessary to identify any effects that are minor (or greater) in isolation (**Table 12.5**) but that may be major cumulatively.

12.8.2 "Target" species were taken to be those species of high Nature Conservation Importance (**Tables 12.2** and **12.7**) for which there was some indication of a potential effect as a result of the Proposed Development, which may be exacerbated cumulatively. However, no significant effects of the Proposed Development were identified, and all effects on all bird species were deemed to be of negligible significance (**Table 12.5**). As such, the predicted in-isolation effects of the Proposed Development are considered to have no potential to contribute to cumulative effects and are therefore negligible across all species.

12.8.3 In conclusion, for all bird species, the cumulative effects of the Proposed Development in-combination with other projects in the NHZ are likely to be negligible and deemed to be not significant under the terms of the EIA Regulations.

12.9 Mitigation Measures

12.9.1 The assessment has concluded that there would be no significant effects on bird species; therefore, mitigation is not required.

12.10 Residual Effects

12.10.1 As the assessment concluded that there was no requirement for mitigation, no significant residual effects have been identified.

12.11 Summary

12.11.1 The likely effects of the Proposed Development have been evaluated in accordance with the methods described in the methodology section of this Chapter. It is concluded, overall, that the likely effects of the Proposed Development on all bird species are not significant under the terms of the EIA Regulations.

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