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Chapter eight
ORNITHOLOGY

INTRODUCTION

8.1 This Chapter, prepared by Avian Ecology Ltd., provides an assessment of the potential impacts of the proposed development on ornithological receptors.

8.2 The assessment of impacts has been based on one year of field based survey between November 2013 and September 2014. In accordance with Scottish Natural Heritage Guidance (2014) at least two years of field survey are normally required to fully assess potential impacts of the proposed wind farm development on ornithological interests. As such, this Chapter in its current form provides a preliminary assessment based on the data gathered up until the time of submission. It should be noted that further survey work is ongoing, and baseline data and the subsequent assessment of impacts will be updated on completion of the full survey schedule. As part of this, relevant information to inform a Habitats Assessment will also be supplied.

8.3 A full project description is provided in **Chapter 3.** The proposed development comprises the erection of seven wind turbines with a maximum blade tip height of up to 126.5m metres, together with a substation and control building, associated hard-standings, a new access tracks, a temporary construction compound and turning area, and other related infrastructure including a permanent meteorological mast.

8.4 A grid connection between the proposed wind turbines and the local electricity distribution network would be the subject of a separate application by the Distribution Network Operator (DNO). Initial research indicates that a connection to the local distribution network could be achieved using underground cables to connect at a point to the north of the development site, near Inverness.

8.5 The following terms are used:

- **Application boundary** - the planning application red line boundary as shown on application drawing AEL007 (Rev No. R5).
- **Build footprint and rotor over-sail** – land within the footprint of the proposed development, as shown on Figure 7.1.
- **Development Site** – land encompassing the entire development including Carr Ban Forest, as shown on Figure 7.1.
- **Study areas** – as defined as relevant with Table 8.8.

8.6 The objectives of this Chapter are to assess the potential impacts of the proposed wind turbine development on ornithological interests by:

- Establishing and outlining baseline conditions;
- Identifying and evaluating key potential impacts,
- Outlining mitigation measures, where required, to ameliorate any potentially significant effects; and
- Outlining enhancement measures, where opportunities arise, to result in net biodiversity gains.

8.7 This chapter describes the assessment methodology, presenting the baseline conditions, together with the identification of the likely significant ecological effects during the construction, operation and decommissioning phases of the proposed development.

8.8 Mitigation measures required to prevent, reduce or offset any significant adverse impacts are described, where appropriate, and the likely remaining (residual) impacts after these measures have been employed are assessed.

CONTEXT FOR ASSESSMENT

8.9 This impact assessment has been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the United Kingdom* (IEEM, 2006), and also using experience of 'best practice' in the ecological assessment of wind turbine developments.

8.10 It is important to note that there is no universally recognised definition of what constitutes significance, but following the above guidance a significant impact, in ecological terms (whether negative or positive) is defined as: *an impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographic area.* Determining whether an impact is deemed significant is therefore often a subjective process based on all relevant and available information, together with professional judgement.

8.11 The chapter addresses the effects associated with the construction, operational and decommissioning phases of the proposed development and considers the potential for cumulative effects arising in combination with other wind developments in the area.

Legislation, Policy and Guidance

8.12 Reference has also been made to the following pieces of legislation, policy and guidance listed in Table 8.1.

Table 8.1: Key legislation, policy and guidance

European
• Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as The Habitats Directive); and • Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (hereafter referred to as The Birds Directive).
National
• The Conservation of Habitats and Species Regulations 2010, as amended (hereafter referred to as the 'Habitat Regulations'); • The Wildlife and Countryside Act 1981 (as amended); • Countryside and Rights of Way Act 2000; • The Wildlife and Natural Environment (Scotland) Act 2011; • The Nature Conservation (Scotland) Act 2004; • National Parks (Scotland) Act 2000; • The National Planning Policy Framework for Scotland 3 (2014) • Scottish Planning Policy (2010); • Scottish Biodiversity List; • 'Birds of Conservation Concern 3' (Eaton *et al.*, 2009); • The United Kingdom Biodiversity Action Plan (UK BAP). • Bird Sensitivity Map to provide locational guidance for onshore wind farms in

Scotland (Bright *et al.*, 2006); • Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2005 and subsequently updated in 2010 and 2014); • Assessing Connectivity with Special Protection Areas (SPAs) (SNH, 2013[a]); and, • Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012).
Local
• Highland Local Biodiversity Action Plan

Consultation

8.13 The purpose of consultation was to identify any relevant existing baseline information held by consultees; to identify any potential concerns associated with the proposed wind turbine development; and to identify any key issues to be addressed and detailed within this ES Chapter.

8.14 A full list of statutory and non-statutory bodies of relevance to ornithology, consulted is provided in Table 8.2, along with a summary of their response and any relevant existing data or information held. The following organisations were consulted during the scoping process or during desk study. The RSPB was contacted directly, separate to the scoping process.

Table 8.2: Summary of consultation responses

Consultee	Summary of Response
Scottish Natural Heritage (SNH)	
Scoping response 20 November 2014	SNH identified ornithology as one of the key issues for the development. Key ornithological issues: • Potential impacts on the interests of the Slavonian grebe interests of Loch Ashie SPA and Loch Ruthven SPA. • Potential impacts on the North of Scotland population of red kites both as an individual scheme and in combination with other developments. SNH acknowledge the sites close proximity to nearby SPA sites and referred to the Druim Ba wind farm application for which a detailed assessment on Slavonian grebes was undertaken. It has been recommended that an assessment of likelihood of flights over the site should be made and a theoretical collision risk model undertaken, if required. SNH have recommended the RSPB is contacted for Slavonian grebe records within the area. SNH acknowledge that the survey effort completed to date appears to be sufficient subject to it being undertaken in accordance with the guidance, not just the principle. SNH have highlighted the current unfavourable conservation status of red kite in the north of Scotland and requested a full impact assessment is conducted on this species, and population modelling undertaken, if required.

Consultee	Summary of Response
Forestry Commission Scotland	
	Awaiting response
Highland Biological Recording Group	
	Provided biological records
Scottish Environmental Protection Agency (SEPA)	
Scoping response 10 November 2014	SEPA identified a series of issues to be addressed in the ES that included carbon balance, disruption to GWDTE's, disturbance and re-use of excavated peat, forest removal and waste, existing ground water abstractions, engineering activities in the water environment, water abstraction, pollution prevention and environmental management and borrow pits.
Highland Council	
Scoping response 14 November 2014	The ES should identify all likely impacts on nature conservation interests of all the designated sites within the vicinity of the proposed development should be taken into account. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant.....the focus here [impacts on designated sites] should primarily be on the impact on the qualifying interests affected by construction. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant. The ES should provide an account of habitats present on the proposed development site. It should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local Biodiversity Action Plans. Habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog, in the contexts of both biodiversity conservation and the inherent risk of peat slide. It is expected that the ES will address whether or not the development could assist or impede delivery of elements or relevant Biodiversity Action Plans. The ES should provide baseline survey of the bird and animals (mammals, reptiles, amphibians, etc.) interest on site. All breeding and wintering surveys must take place at the optimal time of year. It needs to the categorically established which species are present on the site, and where, before a future application is submitted. The presence of protected species such as Schedule 1 Birds of European Protected Species must be included and considered at a later stage. Due to the nature of the development it is likely that impact will be during the construction from disturbance to foraging and nesting areas rather than operation. Any consent given without due consideration to these species may breach European Directives with the possibility of consequential delays or the project being halted by the EC (European Commission)
RSPB	
Stewart Blair email response on 05 December 2014	I have looked through the responses on Highland Council Planning website. I would say that in their response, SNH have highlighted the same concerns as RSPB. We are concerned about the proximity of the proposed development and the ornithological interests in the area, notably Slavonian grebe and breeding raptors.
Scottish Ornithological Society	
	Awaiting response
Scottish Raptor Study Group	
Brian Etheridge email on 17 October 2014	I have limited data on breeding raptors in the area and know only of a pair of breeding ospreys (location treated as **confidential under Schedule 1 of the Wildlife and Countryside Act 1981**). Crested tits occur at low densities throughout the forested area. There used to be black grouse leks in old pasture to the west of Loch Bunachton. I

Consultee	Summary of Response
	know nothing about the occurrence of Slavonian grebe or Capercaillie in the area.
RSPB Capercaillie Officer	
	Provided two biological records of capercaillie within 5km of the proposed turbines.
Black Grouse Project Officer	
	Awaiting response

ASSESSMENT METHODOLOGY

Ornithological Value

8.15 In accordance with CIEEM guidelines, the assessment process firstly requires that ornithological features are valued based on their nature conservation interest (IEEM, 2006).

8.16 For the purposes of this assessment the value of ornithological receptors will be determined using the criteria defined in Table 8.3 based upon CIEEM guidelines geographic scale of values (IEEM, 2006).

Table 8.3: Geographical scale of ecological value (in descending order of importance)

Geographic Scale of Value	Definition
International	Valuation beyond a UK scale, typically at European level.
National	Scotland
Regional	Highlands
District	Inverness
Local	Balnafoich
Site	Of value within the context of the Site

8.17 It should be noted that whilst the evaluation considers the presence of protected species that receive legal protection at various levels (national, international) and non-statutory protection at a local level (through development plans), the simple presence of the species does not necessarily infer value at the level of protection it receives. Therefore, in this assessment, the value of a site for protected species has been dealt with on a species by species basis, taking into account the level of activity, the level of protection it receives and the overall value of habitat on the site for that species.

8.18 Those sites and species classified at 'District / Borough' level and above are considered to be sufficiently valuable for a significant effect upon them to be material in decision making.

Sensitivity

8.19 For the purposes of this assessment, receptor sensitivity is synonymous with value as defined within Table 8.3. Determination of value and therefore sensitivity is also subsequently based on professional judgement and consideration of the rarity, status and distribution of the habitat or species in a geographical context.

Impact Magnitude

8.20 The effects on ecological features are assessed in terms of magnitude and duration. The magnitude of potential impact may be difficult (or in certain cases

impossible) to categorise. The following parameters listed in Table 8.4 are therefore considered.

Table 8.4: Impact parameters

Parameter	Description
Magnitude	The 'size' or amount of the impacts is referred to as the magnitude and is determined on a quantitative basis where possible.
Extent	The area over which an impact occurs. The magnitude and extent of an impact may be synonymous.
Duration	The time over which an impact is expected to last prior to the recovery or replacement of the resource or feature. This can be considered in terms of life cycles of species or regeneration of habitats. The duration of an impact may be longer than the duration of any activity or impact.
Reversibility	Reversible (or temporary) impacts are those that do not last the duration of the development. Either spontaneous recovery or effective mitigation is possible. Irreversible (or permanent) impacts will last the duration of the proposed development and recovery is not possible within a reasonable timescale.
Timing and frequency	The timing of impacts in relation to important seasonal and/or life cycle constraints has also been evaluated. Similarly, the frequency with which activities and simultaneous impacts would take place can be an important determinant of the impacts on receptors, and has therefore also been assessed and described.

8.21 The magnitude of an impact is assessed using criteria set out in Table 8.5. Magnitude refers to the size of an impact, and is determined on a quantitative basis where possible (IEEM, 2006). This may relate to the area of habitat lost to the development footprint or predicted loss of population of a particular species. The magnitude of an impact is often quantifiable in terms of, for example, extent of habitat loss or predicted change in feeding opportunities. However, the loss of habitat alone is not the sole determinant of the scale of the effect. In this assessment an approach has been adopted that considers the effect on the integrity of the receptor in the area.

8.22 The likelihood of an impact occurring is referred to throughout this Chapter using the following terms: certain, likely, unlikely or highly unlikely. While it is reasonably straightforward to identify impacts that are certain to occur, or conversely will not occur, it is generally less practicable to quantify occurrences defined as 'likely' or 'unlikely'. In these circumstances, professional judgement is used, with reasoning supported by available evidence.

Table 8.5: Impact magnitude

Magnitude	Criteria
High	The impact (either on its own or with other proposals) may adversely or positively affect the integrity of a site/population, in terms of the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Medium	Integrity of a site would not be adversely or positively affected, but some element of the functioning of part of the site might be affected and the impact on the site/population is likely to be

Magnitude	Criteria
	significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor adverse or beneficial impact is evident on a temporary basis or affects extent of habitat abundant in the local area.
Negligible	No observable impact in either direction.

Impact Significance Criteria

8.23 As outlined there is no universally accepted definition of significance. However, following the CIEEM guidelines, an ecologically significant impact is that which impacts the integrity of a defined site or ecosystem and/or the conservation status of habitats or species populations within a defined geographical area (IEEM, 2006).

8.24 The overall significance of the impact of an effect is derived by cross-tabulating the magnitude and ecological value. This can be achieved by using the matrix presented in Table 8.6. The results from the impact matrix are however, not considered to be definitive. The overall impact will therefore be a combination of the impact matrix and evidence based approach.

8.25 Where any limitations in information available affect this assessment they have been highlighted. In determining the final predicted level of significance of an effect other factors are taken into consideration. Where possible, these are objective and quantifiable factors such as the time period over which the effect will occur and the reversibility of the effect.

Table 8.6: Effects matrix

Value/Sensitivity of Receptor	Magnitude of Impact			
	Negligible	Low	Medium	High
International	Negligible	Minor/ moderate	Moderate/ Major	Major
National	Negligible	Minor	Moderate	Major
Regional / County	Negligible	Minor	Minor	Moderate
District	Negligible	Negligible/ minor	Minor	Minor/Moderate
Local	Negligible	Negligible	Negligible	Minor
Less than Local	Negligible	Negligible	Negligible	Negligible

8.26 Potential impacts described in later sections assume no specific mitigation measures, which are not already outlined in additional chapters of this ES. Specific mitigation measures are therefore proposed where required to neutralise impacts identified as likely and 'Significant' adverse i.e. those identified as Moderate and/or Major Adverse Significance. A statement of residual effects, following mitigation, is then provided. Residual effects of Negligible or Minor Significance are considered to be of limited concern i.e. 'Non-Significant'.

8.27 To define significance further, the terms 'significant' and 'not significant' are used as shown in Table 8.7.

Table 8.7: Definition of ornithological significance

Magnitude	Criteria
Significant	The impact is significant if the ecological integrity of a feature is influenced in some way. It may be that the impact is large in scale or amount, irreversible, has a long-term impact, or coincides with a critical period in a species' life-cycle.
Not significant	The impact is not significant if it does not influence the ecological integrity. It may be that the impact is small in amount or reversible within a reasonable timescale and/or does not coincide with critical life stages.

Zone of Influence

8.28 The CIEEM Guidelines require the identification of a 'zone of influence', within which lie ornithological areas and resources that may be affected by the proposed development.

8.29 This initially was considered to include all ecological receptors within the development site. This was subsequently extended to potential ornithological impacts upon receptors beyond the development site, based upon the nature of the impact and/or mobility of the receptor.

8.30 Specific study areas were subsequently identified for detailed desk study and field surveys required to inform the valuation of ornithological receptors and the selection of 'key' ornithological receptors.

8.31 For the desk based element of the assessment, the following study areas were identified, searches were centred on grid reference E266655, N836282, approximate centre point of the proposed turbines within the development site unless otherwise stated:

- 2km radius for obtaining citations of non-statutory designated sites with ornithological features of interest;
- 5km minimum radius for obtaining existing records of protected/notable bird species; and
- 20km radius for obtaining citations of Special Protection Areas (SPAs). Other statutory designated sites with ornithological features of interest were identified within a radius of 5km.

8.32 For the field survey based element of the assessment, the following study areas were identified:

Table 8.8: Summary of surveys and study areas

Field Survey	Study Area	Figure
Vantage Point Surveys	At least a 500m buffer around the proposed turbine locations	Figure 8.2
Breeding and non-breeding species	The development site and a 500m buffer around the proposed turbine locations	Figure 8.2
Locally breeding raptors	2km minimum radius from the proposed turbines	Figure 8.3

Point Count Surveys	Development site boundary	Figure 8.2
Woodland grouse surveys	All suitable habitats within a 1.5km radius of the proposed turbines, where access permitted.	Figure 8.3

Cumulative Assessment

8.33 Cumulative impacts are considered with reference to SNH guidance (2012) *'Assessing the Cumulative Impact of Onshore Wind Energy Developments'*.

8.34 Cumulative impacts on key ornithological receptors have subsequently been assessed in relation to wind energy developments within a precautionary maximum zone of influence, which is assumed to be a 10km radius around the site.

8.35 The following developments have been considered:

Table 8.9: Cumulative schemes within 10km

Site	Description
Operational	
Farr Wind Farm	40 wind turbines up to 101m in height approximately 7.5km from the proposal
Proposed (Planning Application or Appeal)	
Glen Kyllachy	20 wind turbines up to 110m in height located approximately 9.2km from the development site.
Hillcroft	2 turbines up to 45.8m in height approximately 3.7km from the development site.

BASELINE METHODOLOGY

Selection of Ornithological Receptors

8.36 This Section should be read with reference to **Appendix 8.1**.

8.37 The selection of ornithological receptors for detailed assessment has been informed by a desk study and series of field surveys undertaken between November 2013 and September 2014.

8.38 The following key guidance documents were reviewed and used to inform the selection of ornithological receptors and the scope of the baseline field surveys:

- SNH (2013[a]) *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms*. Scottish Natural Heritage, Edinburgh.[1]
- Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland (Bright *et al.*, 2006);
- Guidance on Assessing Connectivity with Special Protection Areas (SPAs) (SNH, 2012);

[1] It is acknowledged that the SNH guidance has been revised (SNH, 2014). For the purposes of this assessment baseline surveys were informed by the version of guidance published at the commencement of survey effort in 2013.

- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012);
- Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms (SNH, 2009).
- Scottish Natural Heritage Zones (SNH, 2000). Zone 21: Moray Firth.

Desk Study

8.39 The desk study sought to identify the presence of designated sites for nature conservation with ornithological features of interest, or any records of protected or notable avifauna at the development site or in the immediate environs.

8.40 In addition to those consultees contacted in Table 8.2, the following key resources were consulted:

- Joint Nature Conservation Committee (JNCC) website (http://jncc.defra.gov.uk/); and,
- Scottish Natural Heritage (SNH) information website (http://www.snh.org.uk/snhi/).
- Multi Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/).

8.41 Additional various published and on-line resources were also reviewed to assist in establishing a robust baseline. These are referenced where they are referred to.

Field Surveys

8.42 This Chapter provides an assessment of potential effects on ornithological interests based upon baseline ornithology surveys completed between November 2013 and September 2014.

8.43 In order to comply with SNH guidance 2014, a second year of survey is underway to fully assess potential impacts on key ornithological receptors. Ornithology surveys subsequently remain in progress for completion in autumn 2015 and the current Chapter provides a preliminary assessment based on information gathered to date.

8.44 The following field surveys were completed:

- Vantage Point (VP) Surveys (November 2013 to September 2014);
- Breeding Bird Survey (April to July 2014);
- Raptor Reconnaissance Surveys (April to July 2014);
- Winter Walkover Surveys (November 2013 to March 2014); and
- Point Count Surveys (November 2013 to July 2014);
- Woodland grouse surveys (April to May 2014).

8.45 Details of each methodology are summarised below, with full details presented in Appendix 8.1 and Confidential Appendix 8.2.

Vantage Point Surveys

8.46 The 2013-2014 survey methodology followed Scottish Natural Heritage guidance at the time of survey (SNH, 2013), using two VPs.

8.47 A total of 88 VP hours were completed at VP1 and 94 hours completed at VP2. Survey effort is summarised in Table 8.9, with full details are provided within Appendix 8.1. Survey effort complies or exceeds the recommended minimum VP hours for

raptors including; osprey, red kite, hen harrier, goshawk, merlin, short-eared owl, breeding golden eagle, and breeding peregrine, as detailed in Annex 1 of SNH (2014) guidance.

Table 8.9: Vantage point survey effort summary

		2013		2014									Total
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
VP1	No. Days	2	1	1	1	1	1	3	2	5	2	2	21
	VP Hours	9	6	6	6	6	3	12	9	16	9	6	88
VP2	No. Days	2	1	1	1	1	1	3	2	5	2	2	21
	VP Hours	12	6	6	6	6	3	12	9	19	9	6	94

8.48 Each VP session was up to three hours in duration. Survey times were varied and were completed in a range of weather conditions. Full details of all survey times and conditions are presented in Appendix 8.1.

8.49 Target species were selected by reference to the following documents:

- Scottish Natural Heritage (2013). Survey Methods To Assess The Impacts Of Proposed Onshore Wind Farms On Bird Communities. SNH, Edinburgh.
- Scottish Natural Heritage (2006). Assessing Significance if Impacts from Onshore Windfarms on Birds Outwith Designated Areas. SNH, Edinburgh.
- Scottish Natural Heritage (2013). Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model. SNH, Edinburgh.

8.50 Given the development site's proximity to Inner Moray Firth SPA, Loch Ashie SPA, Loch Ruthven SPA, North Inverness SPA and Longman and Castle Stuart Bays SSSI, target species were also selected with reference to the following:

- Inner Moray Firth SPA Citation 2
- Loch Ashie SPA Citation 3
- Loch Ruthven SPA Citation 4
- North Inverness Lochs SPA Citation 5
- Longman and Castle Stuart Bays SSSI Citation

8.51 Consideration was also given to species listed on Inverness and Nairn Local Biodiversity Action Plan (LBAP) considered likely to be affected by wind turbine developments.

8.52 Secondary species, defined as commoner raptors, all gulls (excluding Mediterranean gull), mallard and feral species, along with any large concentrations of commoner passerine species, were also recorded in 15 minute intervals.

[2] http://jncc.defra.gov.uk/default.aspx?page=1879
[3] http://jncc.defra.gov.uk/default.aspx?page=1871
[4] http://jncc.defra.gov.uk/default.aspx?page=1868
[5] http://jncc.defra.gov.uk/page-1870-theme=default

Breeding Bird Survey

8.53 A Breeding Bird Survey (BBS) was undertaken in the spring and summer of 2014. The methodology employed was based-upon a scaled-down version of the BTO Common Bird Census (CBC) technique, as detailed in Gilbert *et al* (1998).

8.54 The study area comprised the development site as outlined within Figure 8.2, extended to 500m around the proposed turbine locations where access allowed. Five visits were made to the study area.

8.55 During each visit, all species and their behaviours (e.g. singing, carrying food etc.) were mapped in the field.

8.56 All surveys were undertaken during daylight hours and in fine conditions (dry, warm, light breeze and no rain). Survey effort is detailed in Appendix 8.1.

Raptor Searches

8.57 Searches for breeding raptors were also undertaken with reference to species specific survey methodologies as outlined in Hardey *et al.* (2009).

8.58 During each search timed watches were made of key habitat features within the 2km search area and notes made of any raptors recorded and behaviours indicative of breeding observed.

8.59 Four searches were undertaken during the 2014 breeding season. All surveys were undertaken during daylight hours and in fine conditions (dry, warm, light breeze and no rain). Survey effort is detailed within Appendix 8.1.

Winter Walkover Surveys

8.60 Winter walkover surveys were completed on a monthly basis between November 2013 and March 2014. A total of five visits were made.

8.61 During each visit all birds seen or heard within the survey area were recorded, including birds flying over. Survey effort achieved is detailed in Table 8.12.

Point Count Surveys

8.62 A total of ten Point Count Surveys were undertaken between November 2013 and July 2014. With reference to methodologies outlined by SNH (2009) and detailed by Sutherland (2006), Point Count Surveys, also known as Pinewood Surveys, aim to identify breeding and wintering birds such as crossbill, crested tit, woodcock and capercaillie which are difficult to identify using standards breeding bird surveys.

Woodland Grouse Surveys

8.63 Two searches for evidence of breeding woodland grouse were undertaken between April and May 2014. These involved a search of all suitable habitats within the survey area and where access allowed and with reference to methodology presented in Gilbert *et al.* (1998).

BASELINE CONDITIONS

Designated Sites for Nature Conservation

Statutory Designated Sites for Nature Conservation

8.64 This Section should be read with reference to Figure 8.1.

8.65 A review of MAGIC, SNH Sitelink and the JNCC website confirmed that the development site is not directly located within any international or national statutory designated site for nature conservation.

8.66 Table 8.10 below provides a summary of all statutory designated sites for nature conservation with ornithological features of interests identified within a 5km radius of the development site boundary and SPAs and Ramsar Sites within 20km.

Table 8.10: Summary of statutory designated sites for nature conservation

Site Name	Distance & Direction	Description
SPA's		
Loch Ashie SPA (Site Code: UK9001554)	3.1 km west	This site qualifies under **Article 4.1** of the **Wild Birds Directive** (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive. **During the breeding season:** Slavonian grebe. 1 pair representing at least 1.4% of the breeding population in Great Britain (5 year mean, 1991-1995). **On passage:** Slavonian grebe. 44 pairs representing at least 11% of the population in Great Britain (Count as 1993).
Loch Ruthven SPA (Site Code: UK9001551)	8.7 km south-west	This site qualifies under **Article 4.1** of the **Wild Birds Directive** (79/409/EEC) by supporting populations of international importance the following species listed on Annex I of the Directive: **During the breeding season:** • Slavonian grebe. 14 breeding pairs representing up to 20% of the breeding population in Great Britain (5 year mean 1989-1993).
North Inverness Lochs SPA (Site Code: UK9001553)	17.5 km west south-west	This site qualifies under **Article 4.1** of the **Wild Birds Directive** (79/409/EEC) by supporting populations of international importance the following species listed on Annex I of the Directive: **During the breeding season:** • Slavonian grebe. 7 breeding pairs representing up to 10% of the breeding population in Great Britain (5 year mean 1991-1995).
Inner Moray Firth SPA (Site Code: UK9001624)	10.8 km north-west	This site qualifies under **Article 4.1** of the **Wild Birds Directive** (79/409/EEC) by supporting populations of international importance the following species listed on Annex I of the Directive: **During the breeding season:** • Common tern, 310 pairs representing at least 2.5% of the breeding population in Great Britain (Seabirds Census Registrar. • Osprey, 4 pairs representing at least 4% of the breeding population in Great Britain (Early 1990's)

Site Name	Distance & Direction	Description
		Over Winter: • Bar tailed godwit, 1,155 individuals representing at least 2.2% of the wintering population in Great Britain (winter peak mean) The site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **Over winter:** • Greylag goose, 1,731 individuals representing at least 1.7% of the wintering Iceland/UK/Ireland population (winter peak mean) • Red-breasted merganser, 1,731 individuals representing at least 1.4% of the wintering population Northwestern/Central Europe population (winter peak mean) • Redshank, 1,811 individuals representing at least 1.2% of the wintering Eastern Atlantic – wintering population (winter peak mean). • Scaup, 97 individuals representing <0.1% of the wintering Northern/Western Europe population (Count as 1991-96) **Assemblage qualification: A wetland of international importance.** The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl Over winter, the area regularly supports 33,148 individual waterfowl (5 year peak mean 1991/2 - 1995/6) Including: Scaup, Curlew, Oystercatcher, Goosander, Goldeneye, Teal, Wigeon, Cormorant, Redshank, Red-breasted Merganser, Greylag Goose, Bar-tailed Godwit.
Ramsars		
Loch Ruthven		Ramsar criterion 3 – species currently occurring at levels of national importance: • Slavonian grebe. 16 breeding pairs representing up to 38% of the breeding population in Great Britain (5 year mean 1999-2002).
Inner Moray Firth		Ramsar criterion 6 – species/populations occurring at levels of international importance • Greylag goose, 2651 individuals representing at least 2.9% of the wintering

Site Name	Distance & Direction	Description
		Iceland/UK/Ireland population (winter peak mean) • Red-breasted merganser, 135 individuals representing at least 1.3% of the wintering population North-western/Central Europe population (winter peak mean) • Redshank, 2069 individuals representing at least 1.7% of the wintering Eastern Atlantic – wintering population (winter peak mean). • Bar-tailed godwit, 755 individuals representing 1.2% of the wintering Northern/Western Europe population (Count as 1991-96)
SSSIs		
Longman and Castle Stuart Bays SSSI	10.5 km north north-east	The site includes extensive areas of intertidal mudflats which provide rich feeding grounds and an important roosting area for wintering wildfowl and waders including nationally important populations of the following species: • Cormorant • Goldeneye • Red-breasted merganser • Redshank • Widgeon The site also forms part of the Inner Moray Firth SPA.

Non-Statutory Designated Sites for Nature Conservation

8.67 No non-statutory designated sites were identified through desk study within a 2km radius.

Records Search

8.68 No bird records were received from Highland Biological Records Centre (HBRC) therefore local recording groups were contacted for any relevant records they held;

- Scottish Raptor Study Group (SRSG);
- Scottish Ornithological Society (SOC); and
- RSPB's Capercaillie Project Assistant.

8.69 In addition, the Inverness and Nairn Local Biodiversity Action Plan (LBAP) was referred to, to determine species likely to be present in the region.

8.70 Full results of records received and LBAP species are provided within Technical Appendix 8.1 and Confidential Appendix 8.2.

8.71 A number of scarce and common raptor species, diverse and woodland grouse species were also reported along with a range of passerines typical of the locale, including a number of woodland species of conservation concern.

Species

8.72 Surveys are currently ongoing therefore the current baseline is presented based on detailed ornithological survey results undertaken between November 2013 and September 2014 are presented in Appendix 8.1 and Confidential Appendix 8.2.

8.73 The baseline information presented is restricted to species which are considered pertinent to the proposed development, i.e. those which are:

- Afforded specific legislative protection, e.g. under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), or Annex 1 of The Birds Directive;
- Considered potentially vulnerable to effects from wind turbine developments in accordance with SNH guidance (2014);
- Qualifying interests of the statutory designated sites listed in Table 8.10; and
- The general suite of breeding and wintering birds present within the development site.

8.74 In addition to those species considered above, a number of Annex 1, Schedule 1, UK BAP and UK Red listed species of Birds of Conservation Concern (Bocce; Eaton *et al.*, 2009) were reported within the zone of influence in the desk study, but were not recorded during the baseline surveys and could not reasonably be expected to be regularly present on or close to the development site. Such species, mainly rare or scarce passage migrants and seabirds, or those with specific habitat requirements not present, are considered to be of negligible value and are not considered further.

8.75 The baseline for each species considered to be pertinent or potentially pertinent to the development is presented in Table 8.11, incorporating results of field surveys and desktop study. The following Tables use the following abbreviations:

- **VP** Vantage Point;
- **WWO** Winter Walk-Over Survey;
- **BBS** Breeding Bird Survey;
- **RS** Raptor Searches;
- **PC** Point Count Surveys;
- **WG** Woodland Grouse Surveys;
- **Annex 1** Species listed on Annex 1 of The Birds Directive;
- **S1** Species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- **UKBAP** UK Biodiversity Action Plan Priority Species;
- **LBAP** Highland Local Biodiversity Action Plan;
- **Bocce** Bird of Conservation Concern as defined by Eaton *et al.* (2009). Red or Amber listings are given;

- **SBL** Scottish Biodiversity List;
- **CRW** Collision Risk Window; and
- **CRM** Collision Risk Model.

Table 8.11: Key species summary

Species	Status	Summary
Slavonian grebe	SPA, Ramseur	No records of this species were received through desk study and baseline surveys recorded no evidence of this species within the study areas. The area surrounding Loch Ness (west of the site) is the core breeding and moulting area for the species in Scotland and the UK. The species arrives in the spring and leaves after breeding in the autumn. Although no flight activity has been recorded, on consideration of the proximity to statutory designated sites and water bodies which may be used by this species, a precautionary approach is adopted and the site is considered to be of **District** importance for Slavonian grebe.
Cormorant	LBAP	Two cormorants were recorded during a WWO survey on the 25th of February 2014 to the south of the site near Loch Bunachton. No further observations of this species were made during the baseline field surveys. Based on the activity recorded the site is considered to be of **Local** importance for this species.
Grey Heron		A total of seven grey heron flights all involving individual birds were recorded during vantage point surveys. Flight activity was focused near Loch Bunachton to the south of the development site, and to the north, east of VP1. Two of these flights entered the CRW and are therefore included within a non-directional CRM. Using an avoidance rate of 98% (SNH, 2013) it is predicted that the operational phase of the development could result in up to 0.01 collisions per annum, equating to approximately 0.15 birds over the operational life of the wind farm or one collision every 46 years. No further observations of this species were made during the baseline field surveys. Based on the activity recorded the site is considered to be of **Local** importance for this species.
Pink-footed goose	SNH, LBAP	One pink-footed goose flight involving 200 birds was recorded during vantage point surveys on the 29th of April 2014. The flight, heading from west to east, entered the CRW but a CRM was not completed due to this being the only recorded flight of this species during vantage point surveys. No further observations of pink-footed geese were made during the baseline field surveys. Based on the activity recorded the site is considered to be of **Local** importance for this species.

Species	Status	Summary
Teal		One flight involving ten teal was recorded during vantage point surveys on the 22nd of November 2013 over Loch Bunachton. Two pairs of teal were also recorded during a BBS on the 24th of July 2014. Based on this record it is estimated that a total of two pairs of teal bred within the development site on small ponds. Based on the activity recorded the site is considered to be of **Local** importance for this species.
Goldeneye	LBAP	A total of six goldeneye were recorded during WWO surveys. All six birds were observed on Loch Bunachton to the south of the development site, the northern half of which falls within 600m of the proposed turbine locations. Based on the activity recorded the site is considered to be of **Local** importance for this species.
Goosander	LBAP	A total of 13 goosander were recorded during WWO surveys. All 13 birds were observed on Loch Bunachton to the south of the Site, the northern half of which falls within 600m of the proposed turbine locations. Based on the activity recorded the site is considered to be of **Local** importance for this species.
Red kite	SNH, S1, UKBAP	Ten flights of red kite each involving individual birds were recorded during vantage point surveys. Activity comprised foraging birds over moorland and plantation woodland. Four of these flights entered the CRW and are therefore included within a directional CRM. Based on an avoidance rate of 98% (SNH, 2013) the predicted mortality of red kite could reach up to 0.1 birds per annum, equating to approximately 2.42 birds over the operational life of the wind farm or a collision every 14 years. A total of three observations of red kite were made during the four raptor searches, with a peak of two recorded to the north of the development site on the 10th of June 2014. The other record was of an individual bird displaying over potential territory to the south of the Site on the 14th of May 2014. No breeding evidence was recorded within the development site or within 600m of the proposed turbine locations, but the species is considered likely to breed in the local area. Given the level of flight activity recorded during baseline surveys and the potential for locally breeding pairs, the development site is considered to be of **District** importance for red kite.

Species	Status	Summary
Hen harrier	LBAP, S1, UKBAP, A1	One hen harrier flight involving an individual 'ringtail' bird was recorded during vantage point surveys on the 19th of March 2014. The bird was flying low over moorland to the north of the development site, rising above plantation woodland north of the VP. This flight did not enter the CRW therefore a CRM was not completed for this species. Suitable breeding habitat exists in the area around the development site, particularly open habitats to the north. Given the level of flight activity recorded during baseline surveys and on consideration of nearby habitats and conservation status, the development site is considered to be of **Local** importance for hen harrier.
Golden eagle	LBAP, UKBAP, S1, SNH	One golden eagle flight involving an individual 'third year' bird was recorded during vantage point surveys on the 15th of May 2014. The bird flew south over the development site, being mobbed by an adult osprey. This flight entered the CRW but a CRM was not completed due to this being the only recorded flight of this species during vantage point surveys. Given the level of flight activity recorded the site is unlikely to comprise part of a breeding territory, however on consideration of the species' conservation status and the behaviour of young male birds which are known to forage widely over 100's of km, the site is considered to be of **District** importance for golden eagle.

Species	Status	Summary
Osprey	LBAP, UKBAP, S1, SNH	A total of 36 osprey flights were recorded during vantage point surveys between the 15th of May and the 15th of August 2014. Twelve of these flights entered the CRW and are therefore included within a directional CRM. Based on a precautionary avoidance rate of 98% (SNH, 2013) the predicted mortality of osprey could reach up to 0.1 birds per annum, equivalent to 2.59 birds over the operational life of the wind farm or one collision every 9.7 years. Four osprey flights were also recorded during Raptor Reconnaissance Surveys, two of which were recorded on the 14th of May 2014 and the other two on the 10th of April 2014. An active nest site was discovered outside the development site. **Nest locations of a species listed under Schedule 1 of the WCA 1981 (as amended in Scotland) are treated as confidential and provided in Confidential Appendix 8.2.** The majority of osprey flights recorded during vantage point and raptor reconnaissance surveys are thought to involve this nesting pair which successfully fledged two chicks which were also recorded in flight from late July 2014 onwards. Based on the flight activity recorded and the confirmed breeding presence near to development site, the habitats within the development site are of low importance for osprey; however the location of the development site, being situated between a nest site and feeding area raises the value of the development site. The nesting pair located nearby is considered to comprise 2% of the highland population, so the development site is considered to be of **District** importance for ospreys.

Species	Status	Summary
Peregrine	S1, LBAP, UKBAP, SNH, A1	Six flights of peregrine each involving individual birds were recorded during vantage point surveys. Two of these flights entered the CRW and are therefore included within a directional CRM. Based on an avoidance rate of 98% (SNH, 2013) up to 0.01 collisions could occur per annum, equivalent to 0.23 birds over the operational life of the wind farm, or one collision every 109 years. A single peregrine was also recorded in flight to the east of the Site during a Raptor Reconnaissance Survey on the 14th of May 2014. No breeding evidence was recorded within the development site or within 600m of the proposed turbine locations, in addition, no features suitable for nest sites (e.g. cliff faces) were located within at least 600m of the development site. It is likely the species breeds locally and may pass through as part of a wider territory occasionally. Given the level of flight activity recorded the site is considered to be of **District** importance for peregrine.
Northern goshawk	LBAP, S1	No records of this species were returned from consultees; however the species is listed under the LBAP and it is possible the species is present in the local area. The habitats identified within the development site, namely commercial coniferous forestry, with nearby open moorland, bog, open water and broadleaved woodland, provide a suitable mosaic of habitats likely to be used by goshawk. The species was not recorded during any field surveys; however, birds are likely to be present in the area. As such, the site is considered to be of **District** importance for goshawk.
Black grouse	LBAP, UKBAP, S1, A1, SNH	Interim consultation response received from the SRSG provided comment that black grouse were historically present within open moorland to west of Loch Bunachton, but no date was provided. The RSPB are also aware the species in present in the local area, although no specific monitoring has been undertaken. Two active black grouse leks were recorded in the survey area, both of which were outside the development site. Precise locations are considered to be confidential and not presented in this Chapter. The site is considered to be of **District** importance for black grouse.

Species	Status	Summary
Capercaillie	LBAP, UKBAP, S1, A1, SNH	Searches of all accessible suitable habitats within at least 1.5km of the proposed turbines found no evidence of capercaillie. Suitable capercaillie habitat is considered to be any native or commercial pinewood with dense ground cover of blueberry and heather with differing ages of trees with open and boggy areas. The development site and surrounding area comprises a mosaic of pine plantation with open blanket bog and heath which offer potential for this species. The development site is therefore considered to be of **District** importance for capercaillie.
Lapwing	LBAP	One lapwing flight involving an individual bird passing from west to northeast was recorded during vantage point surveys on the 17th of February 2014. This flight entered the CRW but a CRM was not completed due to this being the only recorded flight of this species during vantage point surveys. The breeding bird surveys also recorded at least one pair of lapwing within open moorland to the northwest of the proposed development. Given the level of flight activity recorded and the lack of suitable habitats within the development site (dominated by plantation woodland with lack of large open areas), the site is of **Local** value for lapwing.
Curlew	LBAP	A total of 14 flights of curlew involving a total of 15 birds were recorded during vantage point surveys. Two of these flights each involving an individual bird entered the CRW and are therefore included within a directional CRM. Curlew were recorded during breeding bird surveys, with a maximum estimate of three pairs recorded in the open moorland to the north west of the proposed development. This species was also recorded on one occasion during the breeding season Point Count surveys within the development site. Given the level of flight activity recorded and the lack of suitable habitats within the site (dominated by plantation woodland with lack of large open areas), the site is of **Local** value for curlew.

Species	Status	Summary
Snipe	LBAP	Baseline breeding bird surveys identified at least breeding pair of snipe in the open moorland located to the north and west of the proposed development. No further observations of this species were recorded. Given the level of activity recorded the site is considered to be of **Local** value for snipe.
Breeding woodland and moorland birds	-	During baseline surveys the site and immediate vicinity was found to support a breeding bird assemblage, considered typical of commercial pine plantation and open moorland habitats present. A number of passerines of conservation concern were recorded amongst habitats present, including crested tit, cuckoo, redstart, stonechat, song thrush, Mistle thrush, goldcrest, siskin, lesser redpoll. In addition to BBS, PC surveys recorded common crossbill. Four observations of kestrel were observed during raptor searches, although no evidence of breeding was recorded, activity indicated the species likely bred within the local area. Similar activity was recorded of sparrowhawk and it is possible this species breeds nearby. In addition, one possible buzzard nest location was identified south of the development site boundary and a further territory was recorded to the east although no nest location was found. The site has the potential to support some breeding woodland passerines of medium and high conservation concern as species such as crested tit and common crossbill are present therefore is of **District** value.
Wintering woodland and moorland birds	-	Baseline surveys undertaken during the non-breeding season recorded common and widespread passerine species and some of conservation concern such as crested tit, but also saw the addition of woodcock and mallard. The site has the potential to support some land passerines of medium and high conservation concern as species such as crested tit and common crossbill are present therefore is of **District** value.

Future Baseline in the Absence of the Wind Farm

8.76 The development site comprises in the main Carr Ban Forest, a privately owned and privately managed forest. Full details on the forestry current baseline and future proposals are presented in Chapter 15 Forestry.

8.77 Parts of the Carr Ban Forest has been identified as Potential Native Woodland Network Expansion Areas, by the Forestry Commission Scotland. Within these areas the Forestry Commission plan to restructure woodlands with a range of tree species to produce a strategic reserve of timber. These changes would be undertaken over the next 30 years within the Carr Ban Forest irrespective of the proposed development.

8.78 There is currently no future felling plan available for Carr Ban Forest and no proposed re-stocking plan for felled areas.

Evaluation of Ornithological Receptors

8.79 The development site is located approximately 3.1km Loch Ashie SPA, 8.7km from Loch Ruthven SPA, 17.5km from North Inverness Lochs SPA and 10.8km from Inner Moray Firth SPA. Qualifying interest species for the SPA and Ramsar sites are detailed within Table 8.10.

8.80 The Inner Moray Firth SPA, Ramsar site is located over 10km for the proposed development and the qualifying interest species comprise largely coastal species. On review of SNH (2012) guidance, the proposed development lies outwith maximum foraging distances from SPA's for these species and it is considered there is no connectivity between the proposed development and the SPA, Ramsar site. Species which comprise assemblage populations such as goldeneye, teal, goosander and curlew are considered to form part of the wider Great Britain wintering populations (as presented in Musgrove *et al.*, 2013).

8.81 Potential impacts are therefore only considered further on Loch Ashie SPA Ramsar, Loch Ruthven SPA, Ramsar and North Inverness Lochs SPA and their qualifying interest feature of Slavonian grebe. North Inverness Lochs SPA is located over 17km from the proposed turbines but is included as the species is known to move regularly between freshwater lochs in the area.

8.82 Following Bright *et al.*, (2006) the development is located within an area of "Unknown Sensitivity", which indicates that there is no subsequent information available. This guidance acknowledges the distinction between 'low' and 'unknown' sensitivity is precluded, but such areas are generally interpreted as those with the least known ornithological value. Nevertheless, the selection of ornithological receptors and approach to baseline data gathering has therefore adopted a precautionary approach on consideration of statutorily designated sites within the vicinity of the site, as some sensitive species may utilise any potential wind farm site across the UK at times.

8.83 The development site also falls within Zone 21: Moray Firth, of the Scottish Natural Heritage Zones (SNH, 2000) guidance. The site lies on the far southern limits of this zone, close to Zone 7: Northern Highlands and Zone 10: Central Highlands.

8.84 The final selection and evaluation of key ornithological receptors has subsequently been undertaken with reference to desk study data, field survey results and relevant legislation, policy and guidance. A precautionary approach, based upon professional judgement, is adopted where uncertainty arises.

8.85 Table 8.12 presents the evaluation of 'Key' ecological resources, provides the rational as to why individual receptors have been 'scoped in' or 'scoped out' of detailed impact assessment.

Table 8.12: Ornithological Resources 'Scoped-in' for Detailed Assessment

Ecological Receptor	Value	Potential Impacts
Statutory Designated Sites for Nature Conservation	International	No direct impacts anticipated. The potential for pollution and sedimentation effects resulting from construction activity are discussed in Chapter 7 'Ecology'. **Scoped out of assessment**
Slavonian grebe	International	Collision with turbines **Scoped into assessment**
Cormorant	Local	Local value only **Scoped out of assessment**
Grey Heron	Local	Local value only **Scoped out of assessment**
Pink-footed goose	Local	Local value only **Scoped out of assessment**
Teal	Local	Local value only **Scoped out of assessment**
Goldeneye	Local	Local value only **Scoped out of assessment**
Goosander	Local	Local value only **Scoped out of assessment**
Red Kite	District	Habitat Loss – Breeding Habitat Loss – Foraging Temporary Disturbance – Breeding Temporary Disturbance – Foraging Damage to active nests Collision **Scoped into assessment**
Hen Harrier	District	Habitat Loss – Foraging Temporary Disturbance – Foraging Collision **Scoped into assessment**
Golden Eagle	District	Habitat Loss – Foraging Temporary Disturbance – Foraging Collision **Scoped into assessment**
Osprey	District	Habitat Loss – Breeding Habitat Loss – Foraging Temporary Disturbance – Breeding Temporary Disturbance – Foraging Collision **Scoped into assessment**

Ecological Receptor	Value	Potential Impacts
Peregrine	District	Habitat Loss – Foraging Temporary Disturbance – Foraging Collision **Scoped into assessment**
Northern Goshawk	District	Habitat Loss – Breeding Habitat Loss – Foraging Temporary Disturbance – Breeding Temporary Disturbance – Foraging Damage to active nests Collision **Scoped into assessment**
Woodland grouse	District	Habitat Loss – Breeding Habitat Loss – Foraging Temporary Disturbance – Breeding Temporary Disturbance – Foraging Damage to active nests **Scoped into assessment**
Lapwing	District	Temporary Disturbance – Breeding Temporary Disturbance – Foraging **Scoped into assessment**
Curlew	Local	Local value only **Scoped out of assessment**
Snipe	District	Temporary Disturbance – Breeding Temporary Disturbance – Foraging **Scoped into assessment**
Woodland passerine assemblage	District	Habitat Loss – Breeding Habitat Loss – Foraging Temporary Disturbance – Breeding Temporary Disturbance – Foraging Damage to active nests Collision **Scoped into assessment**

Cumulative and In-combination Baseline

8.86 The cumulative assessment includes consideration of those wind energy and other developments already built, those consented but not yet built, those for which a detailed planning application has been submitted but not yet determined and those for which an appeal has been lodged as of October 2014.

8.87 Sites which may be at screening and scoping stages have been excluded on the basis that they may not progress to full applications and do not have sufficient detail available (on the location and size of turbines) to allow cumulative effects to be assessed with any degree of certainty.

8.88 During the assessment of cumulative ecological effects reference has been made to SNH guidance (SNH, 2012b). While this guidance has been developed for Scotland, guidance issued by SNH is widely adopted. It provides a considered and useful framework for the consideration of cumulative effects.

8.89 The SNH (2012) guidance considers that the issue of what constitutes 'the vicinity' within which schemes should be included in a cumulative assessment demands careful judgement according to the nature of the cumulative issues. The range of assessment may depend on the range and territories occupied by the species and generally, the area within which a cumulative assessment is required should relate to the issues involved. The same guidance also states that cumulative effect assessment can be resource intensive, as it requires knowledge at least in outline of the effects of each existing or proposed development within the vicinity. SNH therefore consider that cumulative effect assessments should focus on cumulative effects of a proposal that, taken with other existing or proposed projects, could be a major factor in determining the acceptability of the development from a natural heritage standpoint and hence may affect the eventual planning decision.

8.90 In accordance with SNH guidance the assessment will only consider a limited number of target species, which here is interpreted as those presented in Table 8.9.

MODIFICATIONS TO PROJECT DESIGN

8.91 The potential for impacts upon habitats and species of conservation value was a key consideration in the development design process and a series of embedded mitigation features were included, where these were achievable along with the consideration of other design constraints. Similarly, decommissioning measures will follow those employed during the construction phase.

8.92 The final wind farm layout was derived through a series of design iterations, which sought to minimise the potential impacts upon a range of receptors, including those of an ornithological nature. The mechanisms by which potential impacts on important bird species have been reduced / avoided are outlined below.

Turbine Locations

8.93 A minimum 500m buffer between turbine locations and locally breeding Schedule 1 (WCA) raptor species.

8.94 Located turbines as far as possible from known nearby black grouse lek locations on consideration with other site constraints.

Land-take

8.95 Proposed access tracks have been designed to utilise existing roads and tracks wherever possible, to minimise the requirement for land-take and unscheduled felling.

8.96 The majority of access tracks have subsequently be located along existing tracks, clearings and roads requiring low levels of upgrading.

Cabling

8.97 Cable connections on the development site and between turbines have been grounded, to avoid increased risks of bird collisions, and routed alongside access tracks to minimise any further habitat losses.

Meteorological Mast

8.98 The proposed meteorological mast will be of lattice design with diagonal struts, rather than a guyed structure. Anti-perch devices will also be fitted to the top and supporting booms.

8.99 These features will serve to discourage perching birds and reduce the potential for collisions. Potential collisions risks with the meteorological mast, and increased collision risks with operational turbines are subsequently not considered further.

DESCRIPTION OF POTENTIAL IMPACTS

Construction and decommissioning

8.100 Construction related impacts are considered to be only potentially significant during the main breeding bird season (March to September inclusive), winter use of the site by species of conservation concern is considerably lower than that during spring and summer and the consequences of disturbance are likely to be less important for populations present at this time than during the breeding season.

8.101 The construction of the wind turbines will require the creation of access tracks and construction areas for the wind turbines and operational features, along with a temporary construction compound.

8.102 In addition, construction activities will result in a temporary increase in noise, vibration and human presence within the development site. This has the potential to displace birds from the development site for the duration of construction works (Drewitt & Langston, 2006).

8.103 Disturbance is however, considered temporary and will occur only when construction activities are occurring. Furthermore, construction is not expected to take place over the whole development site simultaneously, but phased over smaller areas.

8.104 The nature of the development, being located within plantation forestry, will require the removal of 26.93ha of plantation forestry which includes up to a 100m buffer from turbine locations. Full details on forestry removal are provided within Chapter 15: Forestry.

8.105 The removal of forestry will likely result moderate levels of noise disturbance and habitat loss on breeding and wintering birds. The context of the construction work, that is within an existing commercial forestry plantation, is also taken into consideration in this assessment.

8.106 In accordance with the wind farm forest restocking plan (Figure 15.4), restocking has been drawn up to integrate the proposed development, whilst taking into account development site conditions, along with environmental and technical constraints. Replanting will subsequently be carried out within four years of felling dates, up to the required buffers for turbines (100m radius) and associated infrastructure, resulting in a net woodland loss of 21.24ha.

8.107 Compensatory planting to comply with the Scottish Government policy on control of woodland removal (Forestry Commission Scotland, 2009 6) is subsequently proposed, and will be identified, in discussion with relevant stakeholders7. It is anticipated that compensatory planting will serve to more than offset net woodland losses resulting from the proposed development, prioritise native broadleaf planting leading to net positive gains for wildlife at least at a local level.

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[6] Forestry Commission Scotland (2009). The Scottish Government's Policy on control of Woodland Removal. Forestry Commission Scotland: Edinburgh.

[7] In compliance with Scottish Government Guidance on Woodland Removal, it is proposed than an agreement to deliver compensatory woodland planting (equating to the net area of woodland lost due to the proposed Carr Ban Wind Farm) would be delivered.

8.108 Overall construction disturbance is, considered temporary and will occur only when construction activities are being undertaken. Furthermore, construction is not expected to take place over the whole build footprint simultaneously, but phased over smaller areas.

8.109 Some species through their listing on Schedule 1 of the Wildlife and Countryside Act (as amended), are afforded additional protection, which makes it an offence to intentionally or recklessly disturb the species whilst it is building a nest or is in, on, or near a nest containing eggs or young; and/or disturb its dependent young. Should site clearance activities be undertaken during the acknowledged breeding seasons for such species there is subsequently potential to result in an offence under the Wildlife and Countryside Act (as amended) and nest failures to occur.

8.110 The potential for pollution arising from during the construction phase and subsequent effects on water quality and habitats are discussed within Chapter 7 'Ecology' and Chapter 14 'Hydrology and Ground Conditions'. These are not considered further within this Chapter.

8.111 Potential construction related impacts will subsequently comprise the following:

- Habitat loss;
- Damage to active nests; and,
- Disturbance /displacement due to construction operations and plantation removal.

Operation

8.112 Potential operational impacts will comprise the operation of the wind turbines themselves, the maintenance of the turbines and all associated infrastructure. Maintenance works will likely require intermittent site visits from staff during daytime working hours.

8.113 The main potential impacts of operational wind turbines on birds are categorised as follows;:

- Direct mortality through collisions;
- Displacement due to disturbance; and
- Barrier effects to movements.

8.114 Each of these is discussed in relation to those species and species groups 'scoped-in' for detailed assessment, and a broad summary of current research is provided below.

Collision

8.115 Evidence of bird collisions with wind turbines has been widely published; however it is generally accepted that some species are more likely to be prone to collision than others (e.g. Langston and Pullan, 2003; Percival, 2005) and that in the UK collisions are relatively rare (SNH, 2010). Significant levels of collision are however, generally associated with large clusters of wind turbines where large numbers of sensitive species occur within the vicinity, or where the development site provides a valuable feeding resource for sensitive species.

8.116 Whilst a wide range of species have been demonstrated to collide with wind turbines (e.g. Hötker *et al.*, 2006), it is typically considered that vulnerable species in

the context of population level effects are generally restricted to some raptors and larger waterfowl.

8.117 Highly manoeuvrable species, such as waders, are not considered to be overly prone to collisions (e.g. Langston and Pullan, 2003; Percival, 2005).

8.118 The potential for collisions for each species or species-group are discussed as appropriate, and a collision risk model in accordance with Band *et al.* (2007) has been completed, where relevant.

8.119 The model allows estimation of the number of annual collision fatalities of a species at a particular wind farm; however it is very dependent upon estimated turbine 'avoidance rates', which vary between different species, and are often poorly quantified (Chamberlain *et al.*, 2005, 2006).

8.120 The level of collision with turbines will depend on the extent to which birds are displaced and the ability of birds to manoeuvre around rotating turbine blades. The extent to which birds are able to avoid collision is largely uncertain due to the lack of UK based research, therefore there are uncertainties in predicting collision mortality. Collision models also rely on the assumption that collision rate is related to bird abundance, which recent work suggests is not necessarily the case (de Lucas *et al.*, 2008), as some species appear more prone to collision than others; however RSPB guidance (Bright *et al.*, 2006) states that '*Estimates of annual collision rates and avoidance rates should be treated with caution, and used as comparative rather than absolute measures*'. As such, it should be acknowledged that the outputs of the Band model do not reflect actual numbers of collisions. Furthermore, the majority of studies from the UK and Europe have not demonstrated any relationship between predicted CRM results and actual number of collisions, for example, the Beinn an Tuirc wind farm in Argyll, Scotland, predicted 3.3 golden eagle collisions per year; there has been no evidence of golden eagle collisions since operation began in 2002 (Whitfield and Haworth, 2010).

8.121 On this basis predicted collisions are subject to some uncertainty and considered to be only probable.

Displacement

8.122 There is evidence to suggest that some bird species will be displaced by the presence of operational wind turbines, although it would appear the extent of displacement is highly variable between species and species-groups.

8.123 In general most breeding bird populations recover post-construction, excluding large waders including snipe and curlew (Pearce-Higgins *et al.*, 2012). It is widely considered that larger birds, often those associated with wide, open spaces with relatively little human activity, are more susceptible to displacement effects (e.g. Hötker *et al.*, 2006). This would include species such as swans and waders, which are not likely to be present within close proximity to the development site due to dominance of plantation forestry.

8.124 Most studies have shown that passerines (i.e. smaller, perching birds) exhibit smaller displacement distances than breeding waders and raptors. For example some passerine species have either been shown to be subject to small scale displacement of 100-200m from turbines or no apparent displacement (Hötker *et al.*, 2006, Devereux *et al.* (2008)). The level of displacement will largely depend on availability of habitats within close proximity to the proposed turbines and the level of plantation felling required.

8.125 A review by Hötker *et al.* (2006) studied a suite of species at wind farm sites across Europe and determined that birds were generally more susceptible to

displacement impacts during the non-breeding season, although displacement levels and distances varied greatly between species, and some species showed a high degree of 'habituation' to operational turbines. During the breeding season, disturbance distances have been shown to reach up to 500m for some species (notable curlew and snipe). Lowland sites have recorded much reduced distances of 300m (Gill *et al.* 1996; Percival, 2003) but the studies are largely inconclusive. It is widely acknowledged that there is limited research available on breeding displacement in the lowland.

8.126 It is therefore not possible to provide a single, standardised 'displacement distance' for all birds or even species groups as evidence is confounding. SNH and the RSPB have subsequently adopted 600m as a suitable precautionary distance for use within Environmental Impact Assessments. This is considered to be highly precautionary and, as further studies become available, evidence will continue to show most species will utilise land considerably closer than 600m from operational wind turbines.

8.127 It is also important to note that a displacement distance should not be interpreted as a 'total sterilisation zone'; rather that it is the distance where no discernible effects can be observed. It is therefore highly likely that some individual birds will be more tolerant than others and at least some birds will continue to forage in closer proximity to operational turbines. Additionally, it is demonstrated through several of the above studies that the effects diminish with distance.

8.128 Nevertheless, in order to present a 'worst-case scenario' a 600m displacement distance is assumed throughout the assessment where species specific or species-group information is not available.

Barrier Effects

8.129 Wind turbines may operate as a barrier to bird movements, causing them to fly further as they navigate around the turbines, leading to increased energy expenditure.

8.130 Hötker *et al.* (2006) noted that bird reactions to wind turbines included observed alterations in flight direction or height, so that birds flew around or above wind farms, and that in some cases it was observed that birds turned around or that the flight formation broke up when confronted by a wind farm. The same study concluded that, in most cases precise effects on species or species-groups were not significant, or insufficient data was available; however a relationship was noted in some cases, including goose species.

8.131 Whilst barrier effects would serve to reduce collision risks given the assumption birds will actively avoid flying through turbine arrays, significant flight diversions may serve to reduce the attractiveness of feeding sites should the development lie between important foraging and roosting sites.

8.132 Given the relatively small cluster of the proposed development, barrier effects are not considered likely to occur and are not considered further within this Chapter.

During Decommissioning

8.133 Impacts associated with the decommissioning of the proposed development are considered to be broadly the same as construction impacts, requiring the temporary creation of compounds to house equipment and machinery and resulting in a temporary increase of disturbance through vehicular traffic and site staff

8.134 Subsequently, decommissioning effects are considered alongside construction effects.

POTENTIAL IMPACTS IN THE ABSENCE OF MITIGATION

8.135 The proposed development has been assessed for an operational life of 25 years based on the information available to date. The assessment will therefore be updated on completion of Year 2 Ornithology surveys, autumn 2015.

8.136 This section identifies the potential impacts of the construction, operational and decommissioning phases of the proposed development on the key ornithological resources in the absence of mitigation.

Designated Sites

8.137 No direct impact upon any statutory or non-statutory designated site for nature conservation are predicted. The potential for effects upon ornithological interests during the construction, operational and decommissioning phases of the proposed development are discussed under individual species sections and species-group sections below where relevant.

Slavonian Grebe

8.138 Slavonian grebes are not specifically listed under SNH 2014 guidance: *Recommended bird survey methods to inform impact assessment of onshore wind farms,* or SNH 2012 guidance: *Assessing connectivity with Special Protection Areas* as a species requiring detailed assessment due to sensitivity to wind farm developments; however, due to the species' rarity and the proximity of the proposed development to nearby designated sites and from specific request from SNH the species is scoped into detailed assessment.

8.139 No evidence of this species was recorded during any baseline field surveys and no evidence of presence on the nearby Loch Bunachton was observed.

8.140 Potential impacts are considered further on Loch Ashie SPA Ramsar, Loch Ruthven SPA, Ramsar and North Inverness Lochs SPA and their qualifying interest feature of Slavonian grebe. North Inverness Lochs SPA is located over 17km from the proposed turbines but is included as the species is known to move regularly between freshwater lochs in the area.

8.141 Combined, the SPA's qualify for supporting 31.4% of the UK breeding population of Slavonian grebe.

8.142 No information on local population numbers and movements have been provided by the RSPB to date.

8.143 For the purposes of the assessment the Loch Ashie SPA, Loch Ruthven SPA and North Inverness Lochs SPA populations at the time of designation (i.e. a total of impacts on 22 breeding pairs and 44 pairs on passage) is taken as precedence to represent the potentially present population.

8.144 The species is in national decline. A total of 14 pairs breed in all of the six Slavonian grebe SPA's in 2012 (five year mean, Hollings *et al*, 2012). Fourteen sites were monitored within the Highland and Moray and Nairn with a total of 34 pairs and ten young. Loch Ruthven SPA held the most pairs with 13 breeding pairs (however only two successfully reared young) (Hollings *et al*, 2012). This is significantly less than qualifying numbers of the SPA's combined (22 pairs).

Construction and Decommissioning

8.145 Slavonian grebes are associated with nearby statutory designated sites, located over 3km from the proposed development. Due to this distance, no construction related effects are considered to occur.

Operation

8.146 For the proposed Druim Ba Wind Farm, located near Drumnadrochit, c. 17km west of the proposed development, a series of desk and field based studies were conducted on the behaviour of Slavonian grebes and the potential effects of wind farm developments on the current Scottish population. The full ES document is unavailable from the Highland Council Planning website; however the accompanying appendices 10.3[8], 10.4[9] and 10.5[10] have been reviewed to inform the assessment below.

8.147 The sole potential effect of the proposed development on Slavonian grebes is collision risk through interaction with turbine blades. This effect may subsequently compromise conservation objectives of nearby SPA's, notably Loch Ashie SPA, Loch Ruthven SPA and North Inverness Lochs SPA.

8.148 Collision is not well documented in grebes. A study by Hotker *et al* (2006) recorded no collision fatalities from a study of 127 different operational wind farm developments in Europe. Infrequent records have been reported from developments in North America with up to 15 fatalities recorded (grebes and coots combined)[11] from four separate wind farms.

8.149 Slavonian grebes are a difficult species to study, being largely nocturnal in their flight patterns; methods for field based study are severely limited. However comparisons with other closely related species enable educated assumptions on likely behaviour and flight activity.

8.150 Slavonian grebes, like the majority of the grebe and diver families are physiologically adapted for underwater diving and swimming. Their physiology is so far specialised to aquatic life that flight capability has been largely compromised. Active flight for this species is energy expensive due to the high wind loading and necessity for rapid wing beats (Fjeldsa 2004[12]). Furthermore breast muscle mass (main muscle for flight) is has been recorded to suffer atrophy during the breeding season, where grebes focus energy resources on fat reserves and breeding (Piersma 1988)[13].

8.151 During the breeding season dispersal is poorly understood in grebes. Relatively reliable comparisons have been made between Slavonian grebes and black-necked (eared) grebes indicating that the species would scout lochs for suitable breeding locations then once settled, the grebes very rarely leave their nest lochan until the end of the breeding season. Furthermore SNH (1996)[14] state that Slavonian grebes do not leave lochans during the breeding season. Therefore any potential collision risks would

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[8] Druim Ba Wind Farm(2010) Appendix 10.3: Sensitivity of Slavonian grebes to wind farms. Natural Research Projects Limited.
[9] Druim Bar Wind Farm (2010) Appendix 10.4: Exploration of Slavonian grebe extinction likelihoods. Natural Research Projects Limited.
[10] Druim Ba Wind Farm (2010) Collision Risk Modelling for Slavonian grebes
[11] McBride Lake, Alberta
Foote Creek Rim, Wyoming
Buffalo Ridge, Minnasota
San Geogonio, California

[12] Fjeldsa 2004
[13] Persma 1988
[14] SNH 1996 Slav grebes do not leave nest sites.

be evident at the beginning of the breeding season (March- April) and the end (August - September).

8.152 Grebes are known to prefer to fly at low altitudes and preferably over water, avoiding tree dense landscapes and take the most direct route to reduce energy expenditure and to reduce exposure to the predation by raptor species such as peregrine (Insley *et al* 2004)[15]. The preference for flight over water features is so the species can quickly dive into water, where it is at an advantage over aerial raptor species[16]. These flight properties suggest the species would travel from nearby lochs (Loch Ruthven, Loch Ashie, North Inverness Lochs SPA's) through valleys, using the shortest flight distance between water bodies. The species would most likely avoid higher altitudes and dense plantation forestry such as the land at Carr Ban as increasing flight altitude would be highly energy expensive. Furthermore, all suitable lochs within the wider area are located to the south of the proposed development with limited opportunity for the species to pass over the site in transit to other loch locations.

8.153 There is a small lochan: Loch Caulan, located to the north east of the proposed development site whereby the species could feasibly be present, having moved from southern lochans; however based on the currently available information of flight height and preference of flight habitats detailed above it would be reasonable to assume that flight transit would take the most direct route from Loch Bunachton to Loch Caulan; through the area of improved grazed pasture bordered by tall plantation woodland on either side.

8.154 The habitats within the proposed development comprise dense plantation forestry, with no water bodies suitable for Slavonian grebes. There is therefore no suitable habitat for Slavonian grebe and no attraction for overflying for this energy conservative species. Furthermore Appendix 10.4 of the Druim Ba Wind Farm provided the augment from Jon Fjeldsa (an acknowledged expert on the group of species) that grebes fly at night to avoid predation by aerial raptors, therefore woodland should surely be avoided for flight to avoid nocturnal avian predators which reside on woodland (e.g. owls).

8.155 It is therefore considered that the likelihood of Slavonian grebes flying over Carr Ban Forest, through the proposed development would be low and collision is highly unlikely to occur.

8.156 Based on the currently available information and field baseline studies, potential impacts from the proposed development would be **Negligible** magnitude on this receptor of **International** value, which would consequently be a **Negligible** effect and **Not Significant**.

Red Kite

8.157 Red kite is a resident breeder which has increased following a re-introduction program across several locations in the UK, including the Scottish Highlands. A total of 62 pairs were recorded to breed in the Scottish Highlands in 2012 (Hollings *et al* 2012) out of a total of 236 pairs in Scotland and 1,087 pairs across the UK. In Scotland are largely limited to Dumfries, between the Cairngorms National Park and Dundee and to the north west of Inverness. The UK wide population appears to be increasing with a reported +805% increase between 1995-2012 (Harris *et al* 2014)[17] so much so that it is no longer considered to be a Rare Breeding Bird in the UK in British Birds publication (issue 107, September 2014); however numbers in Scotland have shown a slower

[15] Insley *et al* 2004
[16] Livezey 1989, Burger 1974
[17] Harris *et al* (2014) The Breeding Bird Survey 2013. BTO Research Report No. 685. Thretford.

increase with population expansion apparently constrained by illegal persecution (Smart *et al*, 2010)[18] nevertheless, North Scotland population is estimated to be increasing by 6.2% per year. The species therefore has a favourable conservation status UK wide but unfavourable in Scotland.

Construction and Decommissioning

8.158 The 2014 baseline field surveys found no evidence of red kites breeding within at least 600m of the proposed turbines although a displaying individual was recorded within the 2km buffer to the south of the Site, so the species is likely to be breeding in the local area.

8.159 Of the ten flights recorded during VP surveys and four flights during raptor surveys, no birds were observed to carry food, nest building material or displaying, so no evidence of behaviour indicative of breeding was observed, with the exception of a single bird during a raptor search. Ruddock and Whitfield, 200719 suggest that 600m is the maximum distance where nesting red kites may be disturbed. During 2014 baseline surveys no red kite nests were identified within at least 600m and therefore no direct construction related effects on this species are anticipated based on the current baseline, leading to an evaluation of a **Negligible** effect which is therefore **Not Significant**. Surveys scheduled in spring 2015 will evaluate this further.

8.160 Foraging red kites are not considered to be particularly reliant on the habitats within the construction area and extensive areas of comparable habitat are present locally. As such, any temporary effects of habitat loss on red kites are not considered significant and constitute a negligible effect. Direct habitat loss for red kite will be **Negligible** and **Not Significant** in EIA terms on the current baseline.

Operation

8.161 Due to the widespread availability of foraging habitats in the vicinity of the development site, there is unlikely to be any significant displacement of red kite by the proposed development.

8.162 Red kites became extinct in Scotland in the late 19th century, primarily due to human persecution on sporting estates. Between 1989 and 2009 a joint venture between RSPB and SNH began a project to re-introduce the species to Scotland using 93 birds of Swedish origin on the Black Isle. To date, the Scottish population has shown a successful increase, almost doubling in number every 4-6 years (SRSG). The Black Isle population is steadily expanding its range, moving south and west, meeting other re-introduced populations from Doune, near Stirling. A further re-introduction was undertaken in Dumfries and Galloway between 2001 and 2005.

8.163 The current Scottish population comprises a minimum of 236 breeding pairs of red kite (Holling *et al*, 2012), of which 62 pairs were monitored in the Highlands region. The population in the Highlands is considered to form part of the Black Isle population and is likely to be under recorded in the region.

8.164 The average lifespan of a red kite is between 4 and 5 years, although this figure is biased towards higher mortality of juvenile birds. Birds do not breed until they are 2 years old. Annual survival rates of first-year red kites are estimated to be 50%, and 61% for older birds (figures from the BTO Birdfacts website20) With an estimated 62 pairs in the Highlands, i.e. at least 104 birds (red kite are largely monogamous species

[18] Smart *et al* (2010) Illegal killing slows population recovery of a reintroduced raptor of high conservation concern – the red kite. *Biol.Conserv.* 143:12702-711.
[19] Ruddock, M. and Whitfield, D.P. (2007). A review of disturbance distances in selected bird species. Report from Natural Research (Projects) Ltd. to Scottish Natural Heritage
[20] British Trust for Ornithology Bird Facts website: www.bto.org.uk

once reaching sexual maturity) and over 236 breeding pairs or 472 breeding individuals in Scotland. This figure excludes immature (non-breeding) birds and unpaired adults, so represents a very considerable under estimation of the local and Scottish total populations.

8.165 Predicted mortality estimated from Collision Risk Modelling estimated up to 1.8 birds (98% avoidance) would collide with the turbines over the operational life of the wind farm, equating to a collision approximately every 14 years. Although, research by Madders & Whitfield (2006) indicated that red kite collisions were very rare, and the use of a 98% avoidance rate was too precautionary therefore a 99% avoidance rate is more appropriate.

8.166 Based on 99%, it is anticipated that 0.04 collisions will occur per annum, relative to a collision every 25 years and 0.9 collisions over the operational life of the wind farm.

8.167 A precautionary approach is adopted and the collision risk impact assessment is based on the SNH recommended 98% avoidance. Table 8.15 below presents the predicted mortality of the proposed development including context to local and regional populations.

Table 8.15: Predicted mortality of red kite

Red Kite	Highland population (104 birds)	Scottish population (472 birds)
98% avoidance (0.1 birds)	0.09%	0.02%
Pre- baseline mortality (39%)	40.56 birds	184.08 birds
Increase in adult annual mortality	0.25%	0.05%

8.168 Based on the figures presented above, which are treated as highly precautionary based on the limitations of the CRM methodology and that the population numbers exclude non-breeding birds and juveniles, the predicted mortality is below 1% increase on both the Regional and National populations. This is considered to be no more than a **Low** magnitude effect on this receptor of **District** value. As the species is likely to be breeding within the local area completion of second year surveys will further determine the potential collision risk for this species. For this reason the assessment of operational effects on red kite will be completed on completion of year 2 surveys.

Hen Harrier

8.169 Up to 329 breeding pairs were monitored in 2012 in the UK, of which 275 were in Scotland and 207 were within SPA boundaries. The area of Moray and Nairn was recorded to support at least nine breeding pairs (Holling *et al*, 2012) and the Highlands supported up to 19 breeding pairs, comprising 2.7% of the UK population.

Construction and Decommissioning

8.170 A single hen harrier was recorded during a VP survey in March 2014. The directional, short fast flight indicated the bird was not hunting over the moorland, but passing through the area as part of a wider territory. It was considered unlikely the species would be roosting within at least 500m of the proposed turbines due to the low levels of activity recorded, although extensive moorland further north over 1km from the proposed turbines may support this species.

8.171 Wintering hen harriers forage over wide areas and construction disturbance will be temporary (lasting for as long as the construction period), so will only affect a very small part of the total foraging range at any one time.

8.172 As there is no evidence to suggest this is a regular hen harrier roost site from current baseline surveys, and construction is temporary in duration, effects are considered to represent no more than a **Negligible** effect which is **Not Significant** on this receptor of District value.

Operation

8.173 Hen harriers are considered to be largely tolerant of operational wind farm, showing no clear signs of displacement, with pairs nesting within 200-300m of operational turbines (Whitfield and Madders 2006, Madders and Whitfield, 2006). Operational effects on hen harrier are therefore discussed in terms of collision only.

8.174 Hen harriers do not regularly hunt over pine plantation forestry, preferring open moorland, reducing the likelihood of the species flying through the rotor swept area of the turbine blades, supported by baseline studies undertaken to date, with no birds entering the collision risk window.

8.175 Due to the widespread availability of suitable foraging habitats in the vicinity of the proposed development site, and the evidence of limited displacement at operational wind farm sites for non-breeding birds (e.g. Bright *et al.* 2009), it is highly unlikely that the proposed development will result in a significant loss of foraging habitat which may affect hen harrier populations. Effects due to operational disturbance/displacement are therefore considered negligible.

8.176 Hen harriers recorded largely recorded below rotor swept height, as is typical of the species (Whitfield & Madders, 2006), so the potential collision risks for this species are considered to be extremely low.

8.177 Should a collision occur, it would be considered to be extremely rare, and unlikely to affect the species population at a Regional or National scale.

8.178 Overall, based on current baseline surveys operational effects on hen harrier will be of **Negligible magnitude**, on a receptor of **District** value. This would subsequently result in an effect that is negligible and **Not Significant.** An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Golden Eagle

Construction and Decommissioning

8.179 Golden eagles occupy large territories, up to 6km in some areas (Fielding and Haworth, 2010) and remain within these territories throughout the year. Golden eagles do no breed until 5 years old therefore before occupying a territory; young birds disperse and become nomadic (Soutullo *et al* 2006ab). Within this phase they avoid occupied ranges and habitats such as conifer plantations, lochs and suburban areas.

8.180 A single bird was recorded during baseline surveys in May 2014. This bird was a third year, flying briefly over the development site and was not recorded again. Based on the age of the bird, it is considered to be a wandering immature and not breeding within the local area. Due to the low levels of activity recorded during year 1 surveys, the habitats within the site are likely to be unimportant for golden eagle. The dominance of forestry cover would also deter golden eagle, with the species preferring more open landscapes as these provide increased foraging opportunities.

8.181 Golden eagles are therefore not considered to be reliant on the habitats within the construction area and extensive areas of comparable habitat are present locally. As

such, any temporary effects of habitat loss on golden eagle are not considered significant and constitute a negligible effect. Direct habitat loss for golden eagle will be **Negligible** and **Not Significant** in EIA terms on the current baseline.

Operation

8.182 The single golden eagle flight recorded entered the collision risk window for approximately 10 seconds in May 2014. Survey effort has demonstrated the proposed turbines are located in an area unimportant for golden eagle and the single bird is considered to be a wandering young individual, not occupying a breeding territory.

8.183 Golden eagle collisions are known to be very rare events in Scotland (Fielding and Haworth, 2010) to date, and based on the level of activity recorded collisions at the proposed development are likely to be very rare.

8.184 There has been recent evidence of golden eagles being displaced from operational wind farms (Fielding and Haworth, 2010). Post construction monitoring at Edinbane wind farm and Beinn an Tuirc wind farm have observed positive displacement of birds avoiding the wind farm area, most likely linked to the rarity of reported collisions. The two wind farms which observed this pattern had breeding territories close to the site, and as there is unlikely to be any breeding pairs within close proximity of the site (at least 2km) it is considered that the potential for displacement would not occur on any breeding pair and have a negligible effect on young wandering individuals.

8.185 Overall, on review of the current baseline operational effects on golden eagle are considered to be of **negligible magnitude** on this receptor of **District** value, resulting in an effect that is **negligible** and **not significant.** An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Osprey

8.186 Up to 209 pairs were thought to be breeding in the UK in 2012 (Holling *et al*, 2012) with 300 young successfully fledged. The study also noted that ospreys were now highly under recorded and possible breeding pairs were not included within the totals. On this basis the population in the UK is considerably higher and on the increase. The most recent Scottish population comprised 181 birds and the Highlands recorded 49 breeding pairs, 27% of the Scottish population (Holling *et al*, 2012).

Construction and Decommissioning

8.187 Ospreys are considered vulnerable to disturbance at nest sites and any disturbance would represent an offence under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

8.188 Disturbance may occur up to a distance of approximately 500m (Bright *et al.*, 2006). A single nest location was identified within the 2km study area. Nest locations of osprey must be treated as confidential as the species is fully protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Further information relating to nesting osprey is presented within Confidential Appendix 8.2.

8.189 The proposed turbines are not located within 500m of any established osprey nest (the species may use historic nest sites on alternative years) and subsequently disturbance to nesting osprey will not occur to such nest sites.

8.190 The species has a diet predominantly of fish therefore typically nests close to open water features, with lochs providing their main food source in Scotland. An active nest was identified within the 2km study area and VP activity recorded this species to fly regularly between the nest location and the nearby Loch Bunachton. Locally, there are known to be a number of other active osprey nests in the locality of Loch

Bunachton, particularly towards Tomfat Woods. The location of the proposed development raises potential for disturbance-displacement of osprey from foraging areas during the construction period which could discourage the nesting pair from using the current nest site. This would be of **Medium** magnitude on the local population on a receptor of **District** value, leading to an effect which is **Moderate Adverse** and **Potentially Significant**.

8.191 As the majority of habitat loss required as part of the construction period comprises forestry plantation, of no foraging value for osprey and the nearby loch will not be affected, habitat loss is considered to be negligible; however, should a pollution incident occur which could affect the drainage onsite and subsequently the water quality of Loch Bunachton, a reduction in fish stocking could lead to an effect of **Medium** magnitude and **Minor Adverse** on this receptor of **District** importance which is **Not Significant.**

Operation

8.192 Breeding ospreys became virtually extinct in the UK in the late 1900's due to illegal killing and egg collection (Dennis, 2008). An increase in protection was provided by the Wildlife and Countryside Act (1981, as amended) and the Birds Directive (Annex 1). The species population has shown a steady increase in numbers and range. Strongholds are primarily in Scotland, with the Highlands supporting up to 27% of the Scottish population.

8.193 The average lifespan of an osprey is approximately 9 years and birds do not breed until they are 3 years old. Annual survival rates of adult osprey are estimated to be 85% (figures from the BTO Birdfacts website[21]) with an estimated 49 pairs in the Highlands, i.e. at least 98 birds and over 181 breeding pairs or 362 breeding individuals in Scotland. This figure excludes immature (non-breeding) birds and unpaired adults, so represents an under estimation of the local and Scottish total populations.

8.194 Predicted mortality estimated from Collision Risk Modelling estimated up to 1.81 birds (98% avoidance) would collide with the turbines over the operational life of the wind farm, equating to a collision approximately every 14 years.

8.195 Table 8.16 below presents the predicted mortality of the proposed development including context to local and regional populations.

Table 8.16: Predicted mortality of osprey

Osprey	Highland population (98 birds)	Scottish population (362 birds)
98% avoidance (0.1 birds)	0.1%	0.03%
Pre- baseline mortality (15%)	14.7 birds	54.3 birds
Increase in adult annual mortality	0.68%	0.05%

8.196 Based on the figures presented above from 2013-2014 baseline surveys, which are treated as highly precautionary based on the limitations of the CRM methodology and that the population numbers exclude non-breeding birds and juveniles, the predicted mortality of <1% on locally breeding osprey is considered to represent a low

[21] British Trust for Ornithology Bird Facts website: www.bto.org.uk

magnitude and negligible / low adverse effect. As the species is breeding within close proximity to the development site, activity may fluctuate annually should the nest location change, therefore completion of second year surveys will further determine the potential collision risk for this species. For this reason the assessment of operational effects on osprey will be completed on completion of year 2 surveys.

Peregrine

8.197 Up to 1,093 pairs were recorded to breed in the UK in 2012 (Holling *et al,* 2012). Overall numbers of breeding pairs have been increasing in lowland England, particularly in urban areas which are closely monitored. Results from 2012 estimate 19 pairs were recorded to be breeding within the Scottish Highlands and 318 pairs in Scotland, although it is likely that the species largely unrecorded.

Construction and Decommissioning

8.198 Peregrine falcons are considered vulnerable to disturbance at nest sites and any disturbance would represent an offence under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

8.199 Disturbance may occur up to a distance of approximately 500m (Bright *et al.*, 2006). No suitable nesting locations (e.g. quarries, cliff faces) are present within at least 500m of the construction areas and subsequently disturbance of nesting peregrines will not occur.

8.200 Although the species is found in a large variety of habitats, commercial pine plantation offer limited opportunities for hunting, with the species preferring more open areas, with greater opportunities for catching small bird prey. The loss of 26.93ha of plantation forestry is considered to be of negligible magnitude.

8.201 Overall construction effects on peregrine falcons are therefore considered to be of **Negligible** magnitude on a receptor of District value, resulting in an effect that is **Negligible** and **Not Significant** on review of the current baseline.

Operation

8.202 SNH guidance (2014) considers that peregrine falcons should be considered where there is evidence of nesting within 2km of a proposed wind farm. The baseline studies undertaken between April and August 2014 did not record any evidence of this species breeding within at least 2km of the proposed turbines. Subsequently, operational effects upon nesting birds are considered unlikely to occur.

8.203 Due to the widespread availability of foraging habitats in the vicinity of the development site, there is unlikely to be any significant displacement of peregrines by the operational turbines.

8.204 Six flights of peregrine falcon were recorded during VP surveys over a total of 11 months and up to 98 hours VP survey effort. Based on precautionary collision model calculations, it was anticipated that collisions could reach up to 0.01 collisions per annum, equating to 0.23 birds over the operation life of the wind farm or 1 collision every 109 years (98% precautionary avoidance rate).

8.205 Peregrines appear to be relatively rare victims of collision with wind turbines (Hötker *et al.*, 2006 and Ryder *et al.*, 2012), therefore the calculated collision rates are likely to be highly precautionary.

8.206 Table 8.17 below presents the predicted mortality of the proposed development including context to local and regional populations.

Table 8.17: Predicted mortality of peregrine

Peregrine	Highland population (19 birds)	Scottish population (636 birds)
98% avoidance (0.01 birds)	0.05	0.002
Pre- baseline mortality (20%)	3.8	127.2
Increase in adult annual mortality	0.002	0.01

8.207 Based on the figures presented above from 2013-2014 baseline surveys, which are treated as highly precautionary based on the limitations of the CRM methodology and that the population numbers exclude non-breeding birds and juveniles, the predicted mortality is below 1% increase on both the Regional and National populations is considered to be no more than a low magnitude effect which is of **Negligible / Minor Adverse** on a receptor of **District** value and **Not Significant.** An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Northern Goshawk

8.208 Up to 514 breeding pairs were monitored in 2012 in the UK, of which 132 were in Scotland and 3 in the Highlands. It is noted by both Rare Breeding Birds Panel (RBBP) and Bird Atlas 2007 that the species is largely under recorded and the population numbers are likely to be significantly higher in Scotland and the Highlands.

8.209 The presence of breeding goshawk has not been confirmed within the development site during baseline surveys undertaken to date; however, for the purposes of assessment a single nest range is considered to be located within the local area.

Construction and Decommissioning

8.210 The loss of 26.93ha of coniferous plantation is considered to be **Negligible** overall and in the context of the wider site which supports up to 154ha of forestry. In addition, the wider area supports extensive coverage of commercial plantation forestry.

8.211 Goshawk are considered to be a species dependant on continuous mature forestry cover (Kenward, 1996[22]), with European birds achieving relatively high densities in mosaics of farmland and woodland (Kenward, 1996: Beier &Drennan, 1997)[23]. During the construction phase the negligible loss of habitat may reduce nesting opportunities; however, the species is known to recover quickly from forestry operations, so much so that a long term study in Europe showed no difference in breeding success in logged and unlogged forests (Penteriani & Faivre, 2001)[24]. On this basis and on consideration of the small amount of habitat loss, the potential for reduced breeding opportunities within the site is of **Negligible** magnitude, resulting in an effect that is of **Negligible** and **Not Significant.**

[22] Kenward, R.E. (1996) goshawk adaptation to deforestation: does Europe differ from north America? Chapter 23. In: Bird, D., Varland, D. & Negro, J. 1996. Raptors in Human Landscapes. Academic press. San Diego.

[23]

[24] Penteriani & Faivre (2001) Effects of harvesting timber stands on goshawk nesting in two european areas. *Biological Conservation,* 101:211-216

8.212 The potential for construction activities to disturb goshawk hunting activity has also been considered. In continental Europe, the species nests and hunts in close proximity to human habitation and is considered to be largely tolerant of human activity; however, in the UK, the species is generally elusive, choosing nest sites in remote areas or rural locations. For this reason, the species is thought to be more sensitive to disturbance. The worst-case scenario is that breeding goshawks would be displaced during the construction phase. Due to the wide availability of habitats in the wider area and the short construction period, the effects are considered to be **Negligible** on this receptor of District importance, resulting in an effect that is **Not Significant.**

8.213 In the absence of the proposed development, the woodland within the development site would continue to be managed under current forestry plans of felling and re-stocking, although these were not available at the time of reporting. It may therefore be assumed that goshawks would continue to occupy their current nest range (and subsequent nest sites) until the prescribed felling or thinning date, but may be expected to shift in response to the available of habitats.

8.214 Should an active goshawk nest be located within development site, there is potential for it to be lost prior to its current prescribed felling date. There is also potential for disturbance to breeding pairs during felling and subsequent construction works associated within the proposed development where undertaken during the goshawk breeding season (mid-March to mid-August; SNH, 2014).

8.215 Goshawks through their listing on Schedule 1 of the Wildlife and Countryside Act (as amended), are afforded additional protection, which makes it an offence to intentionally or recklessly disturb a goshawk whilst it is building a nest or is in, on or near a nest containing eggs or young; and/or disturb its dependent young. Should construction works, including site clearance activities, be undertaken during the breeding season there is subsequently potential to result in an offence under the Wildlife and Countryside Act (as amended) and the nest failure to occur.

8.216 In a review of disturbance and safe working distances to active goshawk nests, most studies recommend a distance of 400m; however, some studies have reported a distance of up to 500m (Petty, 1996; Ruddock & Whitfield, 2007). For the purposes of assessment 500m is therefore adopted as a precautionary disturbance buffer.

8.217 It is anticipated that site clearance works will be undertaken outside of the general breeding bird season, generally acknowledged as 01st March to 31st August. Should vegetation clearance be required during the breeding season, standard mitigation will be implemented in order to determine and prevent any offence occurring under the Wildlife and Countryside Act (as amended).

8.218 On the assumption that a single nest range is present within the wider area, in the absence of mitigation should site clearance works and subsequent construction activities be undertaken within 500m of an active goshawk nest resulting in nest failures, construction phase disturbance effects have the potential to result in a **Medium Magnitude** impact on a receptor of **District** value, which is subsequently of **Minor Adverse** significance, which is **Not Significant**. An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Operation

8.219 No goshawk flights have been recorded during VP watches, undertaken between November 2013 and September 2014. Collision risk cannot therefore be quantified but is likely to be extremely low.

8.220 Whilst collisions for this species and any other species cannot be completely precluded, based on current VP survey data goshawk collisions are considered

unlikely. Reported goshawk collisions with operational wind turbines are considered relatively uncommon, with ten goshawk collisions with turbines have been reported amongst bird fatalities at wind turbines in Europe to date (as per Durr, 201425). This figure should however be treated with caution given the general short-fall in published monitoring results from operational wind farms.

8.221 Recent figures from British Birds (Holling *et al* 2012) report up to 514 breeding pairs in the UK in 2012. This number is an increase from previous years and the highest since RBBP began recording. Breeding goshawk pairs located in Scotland also continues to increase, following historical extinctions (Balmer *et al.*, 2013; SRSG, 2013). In 2012, 128 occupied home ranges were recorded, with the majority of the population remaining in northeast Scotland, Lothian and Borders and Dumfries and Galloway. The RBBP report acknowledges the species is under-recorded and only 3 pairs were monitored in the Highlands of Scotland, representing 2.3% of the Scottish population.

8.222 As outlined above, whilst goshawk collisions cannot be completely precluded, but in view of continued national population increases and adopting a precautionary approach, operational collision effects are considered to result in no more than an impact of **Low Adverse** magnitude, equating to an impact of **Negligible Adverse** significance, which is subsequently **Not Significant**. An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Woodland Grouse

8.223 Black grouse have been subject to significant declines across the UK, largely due to habitat loss. The conversion of heather to agricultural farming and forestation of commercial pine plantation is a key contributor. A national survey in 2005 found at least 3,344 displaying males in Scotland (SNH website, 2014) and it is estimated that at least 5,100 males are present in the UK (RSPB website, 2014). The Highlands are known to support up to 500 males (RSPB, 2011). Most recent population figures show that the species is generally increasing across the UK, although restricted by habitats, populations are improving.

8.224 British Birds (2014) reported at least 133 lekking male capercaillie were monitored in 2012, of these 46 active leks were within the Highlands (comprising 164 males). The species is in decline across Scotland, with numbers steadily decreasing due to the loss of native pinewoods and climate change. Prolonged cool weather in spring experienced over recent years prevents females from finding enough food to reach optimal breeding condition. In addition, recent wet summers have reduced food availability for young chicks, decreasing their survival rate.

Construction and Decommissioning

8.225 No direct habitat loss of nest destruction is anticipated to occur as the majority of habitats requiring removal comprise pine plantation and no activity was recorded within at least 100m of the proposed working areas.

8.226 Capercaillie are considered vulnerable to disturbance at nest sites and any disturbance would represent an offence under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

8.227 Disturbance may occur up to a distance of approximately 500m (Ruddock and Whitfield, 2007), although other studies in Europe have demonstrated that construction work within 100m of a black grouse lek may cause the males to cease temporarily, they

[25] http://www.lugv.brandenburg.de/cms/detail.php/bb1.c.312579.de [Accessed 14th November 2014].

did not leave the lekking site (Tauernwindpark Oberzeiring, Austria, Ruddock and Whitfield, 2007).

8.228 Two black grouse leks were identified within the 1.5km study area and it is considered that at least one of the leks comprising two males is located within 500m of proposed turbines and therefore has the potential to be disturbed and displaced during the construction phase.

8.229 No activity of capercaillie was recorded during baseline surveys and the development site is not located in any core area for the species, subsequently it is unlikely that construction would affect this species.

8.230 Based on currently available information from 2014 baseline surveys, it is anticipated that the construction phase could result in the displacement of two male black grouse using a single lek. This lek represents 0.4% of the Highland population. The construction disturbance would be of **High Magnitude** on this particular lek; however, on consideration of the wider population size, temporary disturbance of two male black grouse would be of **low magnitude**, and **Negligible / Minor Adverse** on this receptor of **District** value and **Not Significant.** An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Operation

8.231 As is typical of these species, no black grouse or capercaillie were recorded during VP surveys and collision risk modelling has not been completed.

8.232 Both species are unlikely to overfly the conifer plantations, remaining along woodland edge, within rides or openings within the woodland. As such collision is considered highly unlikely to occur and is therefore likely to be no more than **Negligible Adverse** effect which is **Not Significant.**

8.233 There has been no conclusive evidence to suggest turbine noise has an effect on lekking males; however, as demonstrated under construction effects, black grouse are particularly sensitive to disturbance therefore the operational phase has the potential to be visually disturbing to nearby lek locations. This impact is considered to be highly unlikely to occur due to the presence of mature pine plantation between operational turbines and lek locations.

8.234 Overall, potential operational effect on black grouse and capercaillie are likely to be no more than **Negligible Magnitude**, resulting in an effect that is of **Negligible** effect and **Not Significant** on these receptors of **District** value. An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Lapwing (breeding)

Construction and Decommissioning

8.235 In 2014 one lapwing territory was recorded within the breeding bird survey area to the west of the Site, within 600m of the proposed turbines.

8.236 Breeding lapwing is acknowledged as a receptor of **District** value given it's listing as a priority species within the Highland LBAP following declines in breeding populations.

8.237 Direct habitat loss for both breeding and non-breeding lapwing is considered to be **Negligible** and therefore **Not significant**, given the suitability of the habitats to be lost for both foraging and nesting lapwing, and in the context of available comparable habitats across the wider Highland and Inverness regions.

8.238 In general Lapwing are not considered susceptible to construction disturbance (e.g. Pearce & Higgins, 2012). Whilst no territories were recorded within the immediate

vicinity of the development site during 2014 baseline survey, based on a precautionary approach, it is in some years assumed pairs may choose to nest closer to the proposed development footprint. Displacement is predicted to result in no more than a temporary **Negligible Adverse** impact upon a receptor of **District** value, which is subsequently considered to be of **Negligible Adverse** significance and therefore **Not Significant**.

Operation

8.239 Lapwing along with other waders are not generally vulnerable to collision (e.g. Langston and Pullan 2003; Whitfield, 2007). Whilst with all species collision cannot be completely precluded, they are likely to be so rare as to have a negligible effect on the species at any population level.

8.240 One lapwing flight was recorded during baseline VP surveys undertaken to date. As above, whilst collisions for this species and any other species cannot be completely precluded, based on current VP survey data breeding lapwing collisions are considered unlikely.

8.241 Collision risks to breeding lapwing are therefore considered to be no more than a **Negligible Adverse** impact upon a receptor of **District** value, which is subsequently considered to be of **Negligible Adverse** significance and therefore **Not Significant**.

8.242 There is considerable evidence that lapwings do not appear to be displaced by operational turbines (e.g. Pearce Higgins, 2012; Hötker *et al.*, 2006). Given the number of territories recorded during baseline within immediate proximity to the turbine locations but on the assumption that in some year pairs may choose to nest closer, operational disturbance to breeding lapwing is considered to be no more than a **Negligible Adverse** impact upon a receptor of **District** value, which is subsequently considered to be of **Negligible Adverse** significance and therefore **Not Significant**.

Snipe (breeding)

Construction and Decommissioning

8.243 Direct habitat loss to wintering and breeding snipe is considered to be **Negligible** in the context of available comparable habitats within the wider Site and the wider region.

8.244 Disturbance from construction activity may result in temporary disturbance of snipe. This will also primarily affect those species associated with grassland habitats and of considered to be of no more than **Local** value.

8.245 Construction effects are therefore considered to be of **Low Adverse** magnitude of temporary **Negligible Adverse** significance, which is subsequently **Not significant**.

Operation

8.246 As with all wind energy projects, occasional collisions cannot be precluded for any species, but these are predicted to be extremely unlikely and to be so rare as to not affect any species at a population level.

8.247 Operational effects on snipe are considered to be of no more **Negligible Adverse** significance overall and subsequently **Not Significant** effect.

Woodland Passerine Assemblage

8.248 The breeding bird survey recorded a breeding bird assemblage of woodland passerines considered to be typical of the locality. This included a number of species of conservation concern including species listed on the SBL, Inverness and Nairn LBAP and the BOCC Red and/or Amber-lists (Eaton *et al.*, 2009).Of particular note was crested tit and common crossbill listed on Schedule 1 of the Wildlife Act (as amended). Baseline surveys undertaken during the non-breeding season also recorded common

and widespread passerine species and some of conservation concern such as crested tit, but also saw the addition of woodcock and mallard.

Construction and Decommissioning

8.249 Construction effects on breeding birds will generally comprise a temporary increase in disturbance levels and a relatively low-level loss of habitat of low ecological interest, in the context of similar habitats available within the wider landscape.

8.250 All wild birds, their nests and eggs in the UK are protected under the provisions of Part 1 of the Wildlife and Countryside Act 1981 (as amended). Under Part 1, Section 1 it is an offence to intentionally or recklessly kill, injure or take any wild bird; or take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird. Should construction activities commence during the breeding bird season, acknowledged as 01st March to 31st August inclusive, there is potential for an offence to occur under the provisions of the Act. Standard mitigation is therefore proposed.

8.251 In addition species listed under Schedule 1 of the Act, including crested tit and common crossbill, are afforded additional protection from disturbance on or near their active nests.

8.252 The number of crossbill territories present within the development site is likely to vary annually depending on the year's cone crop, with more territories present in good cone abundance years. Active nests may also be found throughout the year (January to mid-December), limiting the potential for noisy and intrusive construction works to be undertaken outside of the common crossbills breeding season.

8.253 Crested tits are restricted to small areas of Scotland in the UK, including Easter Ross, Strathspey and around the Moray Firth Coast. The species is a specialist in the country, preferring mature pine forestry such as Caledonian pine where mature trees and deadwood are plentiful; the species requires a diverse diet of invertebrates and pine seeds. Heather cover also supplies a reliable food source during the winter months. The pine plantation within the development site is relatively young, with mature Caledonian forest identified to the north and west of the site boundary offering higher habitat value.

8.254 In a review of disturbance and safe working distances it is suggested that common crossbill should be buffered from forestry activities at between 50-150m and crested tit from 50-100m (Ruddock & Whitfield, 2007). For the purposes of assessment 150m is therefore adopted as a precautionary disturbance buffer and standard mitigation is therefore proposed.

8.255 Common crossbill breed throughout the year, therefore if construction works were to take place during the non-breeding bird season likely effects would be no more than a temporary, **Low Adverse** impact on receptors of **Local** value for all species; however this timing could result in the displacement of up to 4 pairs of common crossbill which is considered to be a **Medium Adverse** impact on a receptor of District value, both of which are therefore **Not Significant.**

8.256 Should works be required during the breeding bird season (April – September inclusive) it is possible that up to 2 pairs of crested tit may be displaced from within 150m of construction areas. This would result in a **Medium Adverse** effect on a receptor of **District** value, which is **Not Significant** overall.

8.257 An updated assessment of effects will be completed on completion of surveys in autumn 2015.

Operation

8.258 Studies in Spain have shown that passerine (small, perching birds) numbers are also not negatively affected following wind farm construction (e.g. De Lucas *et al.*, 2005), with the species group also not considered to be adversely affected by operational wind turbines.

8.259 Operational effects on passerines are considered to **Not Significant** at any population level. An updated assessment of effects will be completed on completion of surveys in autumn 2015.

SUMMARY OF PREDICTED EFFECTS

8.260 Table 8.13 summarises the preliminary assessment prediction of impacts on key ornithological receptors, in view of baseline information collated to date.

MITIGATION

During construction

8.261 A Construction Environmental Management Plan (CEMP) will be agreed in advance of construction with relevant regulators and consultees. The objective of the CEMP will be to minimise the potential for effects on breeding birds and statutory designated sites with ornithological interest throughout the construction period.

8.262 Construction activity will be limited to clearly defined working areas. Standard best practice mitigation measures will be employed. An Ecological Clerk of Works (ECoW) will be available for the duration of the construction period to resolve any uncertainties regarding ecological issues. The site workforce will be briefed about the ecological issues on the site by the ECoW prior to the commencement of construction.

Breeding Birds

8.263 All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. Some rare or vulnerable bird species (e.g. osprey) are listed as Schedule 1 species in the Wildlife and Countryside Act 1981 (as amended). In addition to protection under Section 1 of the act, Schedule 1 species receive additional legal protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or in, on or near a nest containing eggs or young; or to disturb dependent young.

8.264 To avoid potential disturbance to Schedule 1 species, all areas within at least 500m of site clearance activities (for Goshawk) will be surveyed in advance of works being undertaken during the core breeding season (01st March to 31st August, inclusive) to identify nesting locations for specially protected species. In addition and in advance of site clearance works being undertaken at any time of year, all areas within at least 150m of activities will be surveyed to identify breeding evidence of common crossbill. Should such species be recorded, appropriate works exclusion zones would be established in line with best practice guidance for the species involved and in consultation with the ECoW.

8.265 A Breeding Bird Protection Plan (BBPP) would be drawn up within the CEMP with the aim of protecting breeding birds from disturbance and ensuring compliance with nature conservation law during the construction phase (e.g. during vegetation removal).

During operation

8.266 No significant operation effects are anticipated. Mitigation is therefore not proposed.

During decommissioning

8.267 Decommissioning works mitigation will broadly follow those undertaken during the construction period and will follow a Decommissioning Management Plan (DMP). The objective of the DMP will be to minimise the potential for effects on breeding birds and statutory designated sites with ornithological interest throughout the construction period.

RESIDUAL EFFECTS

8.268 A summary of residual effects is included within Table 8.18.

ENHANCEMENT MEASURES

8.269 Enhancement measures to be incorporated will be included within a project Biodiversity Management Plan (BMP) to be agreed in consultation with relevant stakeholders. As a minimum the following measures, are proposed to provide positive gains for birds, at a local level.

8.270 As a minimum the following measures, in addition to onsite compensatory woodland planting detailed in Chapter 7: 'Ecology' and Chapter 15: 'Forestry', are proposed to provide positive gains for birds, at a local level.

8.271 In order to accommodate the proposed wind turbines and associated infrastructure, woodland will be clear felled as shown on Figure 15.4. Re-stocking will subsequently occur up to the required buffers for turbines (100m buffer), comprising a predominant mix of coniferous species, and to a lesser extent broad-leaved species.

8.272 Open tussocky grassland strips are also proposed around the key-holed areas to encourage and enhance raptor and owl foraging beyond the CRW.

8.273 Creation of blanket bog or heathland in areas of clear fell, where appropriate.

8.274 Where possible standing dead-wood will be retained in key-holed areas to enhance feeding resources for woodland passerines, and food nesting opportunities for hole-nesting birds such as woodpeckers.

8.275 In addition the installation of bird nest boxes within the development site boundary also proposed and is considered to provide increased nesting opportunities for birds at a local level.

8.276 Nest boxes to be installed will be of a variety to include those suitable for a range of LBAP species SBL including spotted flycatcher and barn owl. Additional boxes suitable for use by tawny owl will also be installed.

8.277 The exact number and locations of nest boxes to be installed will be agreed in consultation with relevant stakeholders and be included within the project BMP.

Table 8.18: Summary of predicted effects and residual impacts

Receptor	Ecological Value	Potential Effect	Impact Magnitude	Effect Significance	Mitigation Proposed	Residual Impacts
Slavonian grebe	International	Collision	Negligible	Negligible	No	Not Significant
Red Kite	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Habitat Loss – Breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		Destruction of active nests	Negligible	Negligible	No	Not Significant
		Collision	Low	Negligible / minor adverse	No	Not Significant
Hen harrier	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		collision	Negligible	Negligible	No	Not Significant
Golden eagle	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		collision	Negligible	Negligible	No	Not Significant

Receptor	Ecological Value	Potential Effect	Impact Magnitude	Effect Significance	Mitigation Proposed	Residual Impacts
Osprey	District	Habitat Loss- foraging	Medium	Minor adverse	Yes	Not Significant
		Habitat Loss – Breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - breeding	Medium	Minor adverse	Yes	Not Significant
		Temporary disturbance - foraging	Medium	Minor adverse	No	Not Significant
		Destruction of active nests	Negligible	Negligible	No	Not Significant
		Collision	TBC	TBC	TBC	TBC
Peregrine	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		collision	Low	Negligible / minor adverse	No	Not Significant
Northern Goshawk	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Habitat Loss – Breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		Destruction of active nests	Medium	Minor adverse	Yes	Not Significant

Receptor	Ecological Value	Potential Effect	Impact Magnitude	Effect Significance	Mitigation Proposed	Residual Impacts
		Collision	Low	Negligible / minor adverse	No	Not Significant
Woodland Grouse	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant
		Habitat Loss – Breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - breeding	Low	Negligible / minor adverse	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		Destruction of active nests	Negligible	Negligible	No	Not Significant
		Collision	Negligible	Negligible	No	Not Significant
		Permanent disturbance / displacement	Negligible	Negligible	No	Not Significant
Lapwing	District	Temporary disturbance - breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
Snipe	Local	Temporary disturbance - breeding	Low	Negligible	No	Not Significant
		Temporary disturbance - foraging	Low	Negligible	No	Not Significant
Woodland passerine	District	Habitat Loss- foraging	Negligible	Negligible	No	Not Significant

Receptor	Ecological Value	Potential Effect	Impact Magnitude	Effect Significance	Mitigation Proposed	Residual Impacts
assemblage		Habitat Loss – Breeding	Negligible	Negligible	No	Not Significant
		Temporary disturbance - breeding	Medium	Negligible/ minor adverse	No	Not Significant
		Temporary disturbance - foraging	Negligible	Negligible	No	Not Significant
		Destruction of active nests	Medium	Negligible/ minor adverse	Yes	Not Significant
		Collision	Negligible	Negligible	No	Not Significant

CUMULATIVE IMPACTS

8.278 Based upon baseline information collated to date, the construction, operational and decommissioning effects of the Carr Ban proposed development on key ornithological receptors are predicted to be of no more than Minor adverse significance.

8.279 In accordance with SNH guidance (2012), a cumulative impact assessment need only be sought where it is considered that a proposal could result in significant cumulative impacts.

8.280 It is therefore considered appropriate to conclude that based upon baseline information collated to date, the proposed development would not be predicted to contribute significantly to any of the impacts identified in respect of other proposed developments within a 10km radius.

8.281 The Carr Ban proposed development alone or in-combination with any other project is therefore considered to result in no significant impacts upon ornithological receptors. This is by virtue of the relatively small number of larger-scale cumulative schemes and predicted non-significant impacts upon only a small number of ornithological receptors.

8.282 As outlined, this conclusion is based upon baseline information collected to date and will be updated following the completion of ornithology surveys currently in progress, for completion in Autumn 2015.

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