

Contents

9.0 Ornithology	1
9.1 Introduction.....	1
9.2 Legislation, Policy and Guidance	1
9.3 Scope and Consultation.....	2
9.3.1 Consultation.....	2
9.3.2 Effects Scoped Out.....	3
9.4 Approach and Methodology	3
9.4.1 Study Area.....	3
9.4.2 Information and Data Sources	3
9.4.3 Designated Sites.....	4
9.4.4 Desk Study.....	4
9.4.5 Field Survey.....	4
9.4.6 Collision Risk Modelling.....	6
9.4.7 Assessment Methods	6
9.4.8 Assumptions, Limitations and Confidence.....	7
9.4.9 Sensitivity Criteria.....	7
9.4.10 Assessing Impacts and the Significance of an Effect.....	8
9.4.11 Avoidance, Mitigation, Compensation and Enhancement.....	8
9.5 Environmental Baseline and Potential Sources of Impact.....	9
9.5.1 Current Baseline.....	9
9.6 Evaluation of Ornithological Features.....	15
9.6.1 Future Baseline	19
9.6.2 Potential Sources of Impact	19
9.6.3 Embedded Mitigation and Good Practice Measures.....	20
9.7 Assessment of Potential Effects.....	21
9.7.1 Construction Effects.....	21
9.7.2 Operational Effects.....	23
9.7.3 Decommissioning Effects	28
9.8 Mitigation.....	28
9.8.1 Further Survey Requirement and Monitoring.....	29
9.9 Assessment of Cumulative Effects	29
9.9.1 Goshawk.....	32
9.9.2 Pink-footed and Greylag Goose.....	32
9.10 Screening for Appropriate Assessment.....	32
9.11 Summary.....	33
9.13 References.....	35





9.0 Ornithology

9.1 Introduction

This Chapter provides the Ornithological Impact Assessment for the proposed development. The specific objectives of the chapter are to:

- describe the current baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect and cumulative effects;
- describe the mitigation measures proposed to address the likely significant effects; and
- assess the residual effects remaining following the implementation of mitigation measures.

This Chapter is supported by the following Technical Appendices:

- **Technical Appendix 9.1: Bird Survey Report;**
- **Technical Appendix 9.2: Collision Risk Modelling Report; and**
- **Technical Appendix 8.7: Habitats Regulations Appraisal Shadow Stage 1 Screening Report.**

9.2 Legislation, Policy and Guidance

The ornithological assessment has been undertaken with reference to the following legislation:

- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) (the Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended in Scotland);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

Planning policies relevant to ornithology are listed below. Further information regarding planning policy is provided in **Chapter 4: Climate Change, Renewable Energy and Planning Policy**, and in **Chapter 5: Approach to EIA and Consultation**. The **Planning Statement** addresses the planning policy position in full and should be referred to.

- National Planning Framework 4 (2023) (e.g., biodiversity);
- Moray Planning Policy: EP1 'Natural Heritage'.

Other documents and guidance reviewed and applied in the ornithological assessment are outlined below (see also References Section at the end of this Chapter):

- Band, Madders and Whitfield (2007). Developing Field and analytical Methods to Assess Avian Collision Risk at Wind Farms;
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2022). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine;
- Goodship and Furness (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species;
- Scottish Government (2013). Scottish Biodiversity List (SBL);



- Scottish Renewables *et al.* (2019). Good Practice during Wind Farm Construction, Version 4;
- Scottish Natural Heritage (SNH) (now NatureScot) (2016a). Assessing Connectivity with Special Protection Areas (SPAs);
- SNH (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information;
- SNH (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms, Version 2;
- SNH (2018a). Assessing Significance of Impacts from Onshore Wind Farms on Birds Outwith Designated Areas, Version 2;
- SNH (2018b). Assessing the Cumulative Impact of Onshore Wind Energy Developments; and
- Stanbury *et al.* (2021). *The Status of our Bird Populations: the Fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and Second IUCN Red List Assessment of Extinction Risk for Great Britain.*

9.3 Scope and Consultation

9.3.1 Consultation

Table 9-1 includes a summary of ornithology-specific points raised by consultees during scoping and subsequent consultation process, and where these are addressed in this Chapter and/or elsewhere in the EIA Report.

Table 9-1: Consultation – Key Issues

Consultee, form of consultation and date	Issue Raised	Response/Action Taken
NatureScot, by letter, 8 th December 2021.	Protected areas: NatureScot (NS) focus on avoidance of adverse effects to protected areas. Agree with list of sites provided in scoping report for assessment. Request that a Habitat Regulations Appraisal be provided to address Moray Firth Special Protection Area (SPA), Moray and Nairn Coast SPA, Tips of Corsemaul and Tom Mor SPA and Loch Spynie SPA. The proposed survey/assessment methodology deemed sufficient to inform EclA and HRA.	Technical Appendix 8.7: Shadow Habitats Regulations Appraisal addresses all listed protected areas within the consultation response and extends to include for Moray and Nairn Coast Ramsar and Loch Spynie Ramsar. The conclusions screen out need for further assessment at Step 3 (Assessment of Likely Significant Effects). Follow up consultation with Senior Planning Officer (Development Management) of Moray Council, confirmed on 3rd August 2023 that Moray Council ' <i>...accept the conclusions as set out in Section 5 of the Stage 1 report</i> '.



Consultee, form of consultation and date	Issue Raised	Response/Action Taken
NatureScot, by email, March 2022 (various dates).	Ornithology data: SLR provided an ornithology survey report for 2021-22 which included a data review for the Aultmore Wind Farm. This outlined the justification for reducing the scope of surveys to one year.	NatureScot confirmed (on 21 st March 2022) the view that "a second year of survey would likely generate very similar results to the first, and that this data has been gathered following all relevant guidance."
RSPB Scotland, by letter, 8 th December 2021.	Confirmed that we are satisfied with the scope of the EIA as presented and we do not hold any recent ornithological records for the site which have not been considered by the report.	No further action required.
Highland Raptor Study Group, by email, 7 th December 2022.	Confirmed that HRSG don't hold useful information in the vicinity of this forest, despite it being covered by group members. Advised to contact Forestry and Land Scotland (FLS) for further info.	FLS were subsequently contacted for information which was provided.

9.3.2 Effects Scoped Out

As set out in the EIA Scoping Report (SLR, 2021), the following have been scoped out of the ornithology assessment (due to lack of presence within the Site):

- Impacts on capercaillie; and
- Impacts on crested tit.

In addition, impacts on species/groups not susceptible to significant effects from wind farms (such as woodland passerines) have been scoped out, as specified in current NS (SNH, 2017) guidance. No Schedule 1 woodland passerine species were present within the Site.

9.4 Approach and Methodology

This Chapter takes an appropriate and topic-specific approach to assessment of the proposed development within the parameters identified in **Table 3-1** of **Chapter 3: Site Selection and Design Evolution**. This Chapter provides a worst-case assessment for ornithology and aims to describe the likely significant effects of the proposed development and present enough information for consultees and the decision makers to comment on and determine the application within the parameters of the proposed development.

9.4.1 Study Area

The study area used for the surveys undertaken to inform the Ornithological Impact Assessment differs according to receptor as recommended by relevant good practice survey guidance, as defined by NatureScot (NS) (formerly SNH) guidelines (SNH, 2017). These are summarised in the Field Survey Methodology Section and are described in more detail within **Technical Appendix 9.1: Bird Survey Report**.

For the assessment of impacts on bird species a variety of buffer distances have been applied to each turbine location and around all other infrastructure where appropriate. These buffers are in accordance with current guidance and evidence-based research. Further details are provided in the Assessment of Potential Effects Section.

9.4.2 Information and Data Sources

A desk study was undertaken to collate existing information on bird populations in and around the Site, and to identify target species for baseline surveys.



This information, combined with baseline survey results, was utilised to put each target bird species recorded within the study area into context in terms of its national, regional and local importance.

9.4.3 Designated Sites

A desk search was carried out via the NatureScot SiteLink website (NatureScot, 2021) to identify statutorily designated sites within 20km of the Site which are designated for their avian interest (including Special Protection Areas (SPAs) and SSSIs). Beyond 20km connectivity between SPAs and development proposals is unlikely and given the nature of the proposed development significant effects on terrestrial SACs are also unlikely beyond this distance. The distance of 20km is, however, pertinent to grey geese species only such as greylag goose and pink footed goose. Further information on the interest features of sites was obtained through the JNCC and NatureScot websites.

9.4.4 Desk Study

Primary sources of contextual data from the desk study were as follows:

- Aultmore Wind Farm Redesign, Bird Data Review (SLR 2022);
- The Birds of Scotland (Forrester et al., 2007);
- Birds in Moray & Nairn in 2019 (SOC 2022);
- Scottish Raptor Monitoring Scheme Reports (e.g. Challis et al., 2020);
- Review of published estimates of bird populations in Scotland (Wilson et al. 2015) and the UK (e.g., from the Avian Population Estimates Panel (APEP, Woodward et al. 2020));
- Data for breeding Schedule 1 birds in the vicinity of the Site from Forestry and Land Scotland (FLS);
- A search for and review of any EIA Report or Environmental Statement chapters, survey reports and post consent monitoring reports from other developments within the relevant Natural Heritage Zone (NHZ 12 – North East Glens); and
- Review of relevant online resources (e.g., BTO website).

9.4.5 Field Survey

Baseline ornithology surveys were conducted during the period March 2021 to February 2022 and June/ July 2022. Full details are presented in **Technical Appendix 9.1: Bird Survey Report** with a summary provided below.

9.4.5.1 Target Species

Target species for the flight activity surveys were chosen considering the location of the Site and were defined by legal and/ or conservation status and vulnerability to impacts potentially caused by wind turbines, as defined in SNH (2017).

The following species were considered as primary target species:

- Species listed on Annex I of the Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981, in particular raptors and owls;
- Kestrel (*Falco tinnunculus*)¹;
- All wader species;
- All diver species;

¹ Due to conservation status as an Amber species and the species vulnerability to wind turbines



- All grouse species (including capercaillie (*Tetrao urogallus*));
- Crested tit (*Lophophanes cristatus*); and
- All wild goose, swan and duck species, except for Canada goose (*Branta canadensis*) and mallard (*Anas platyrhynchos*).

The following species were considered as secondary target species:

Non-Annex I and/ or Schedule 1 raptor species (other than kestrel which is a primary target species):

- Buzzard (*Buteo buteo*);
- Sparrowhawk (*Accipiter nisus*); and
- Other species of lesser conservation importance which are considered to be potentially vulnerable to impacts from wind farm developments.

9.4.5.2 Baseline Survey Methodologies

Surveys were undertaken in 2021/ 2022 (breeding season and non-breeding season) and were carried out in accordance with current NS guidance on bird survey methods for onshore wind farms (SNH 2017) and taking note of scoping consultations with NS. Following the first year of surveys, a review of the available ornithology data for the Site and surrounding area was undertaken to inform consultation with NS on the survey effort required for the Site (SLR 2022). On the basis of this data review NS confirmed that a single year of data was sufficient to inform the EIA.

Figures showing vantage point locations and viewsheds, plus the species-specific survey buffers, are provided in **Technical Appendix 9:1: Bird Survey Report**.

9.4.5.3 Flight Activity Surveys

Standard flight activity surveys were conducted from four vantage point (VP) locations during each season (March to August 2021 (48 hours per VP) and September 2021 to February 2022 (48 hours per VP)). This included additional hours in March/ April and September/ October to cover the migratory periods for geese. These survey hours either meet or exceed the current NS guidance of 36 hours per VP per season (SNH 2017).

9.4.5.4 Breeding Wader Surveys

Surveys for breeding waders were carried out within the Site boundary and a 500m buffer (where accessible) around it (following SNH (2017) which includes recommendations set out in Calladine *et al.* (2009), requiring an adapted Brown & Shepherd (1993) method with four survey visits at least seven days apart between mid-April and the end of July. To maximise efficiency, the breeding wader surveys and breeding raptor surveys were combined due to the lack of suitable wader habitat (i.e., open ground) within the Site boundary.

9.4.5.5 Breeding Raptor Surveys

Species-specific surveys were undertaken for all raptors likely to occur, following methods outlined within Hardey *et al.* (2013), within 2km of the Site (where accessible), between mid-April and late July 2021.

9.4.5.6 Black Grouse Lek Surveys

Black grouse *Lyrurus tetrix* surveys were undertaken based on the standard methodology (Etheridge and Baines (1995), Gilbert *et al.* (1998)). Two visits were undertaken, in mid-April and mid-May 2021.



9.4.5.7 Capercaillie Transect Survey

Two visits were undertaken in April 2021 to assess the habitat suitability for capercaillie and to search for evidence of their presence. Surveys followed the pinewood bird survey method as described in Gilbert *et al* (1998) looking for evidence described in SNH Capercaillie Survey Methods (2013).

9.4.5.8 Crested Tit Transect Survey

Two crested tit transect surveys were undertaken in April 2021 alongside the capercaillie surveys, to search for suitable habitat and evidence of their presence. Surveys followed the pinewood bird survey method as described in Gilbert *et al* (1998).

9.4.5.9 Lochan Survey

One visit was undertaken in June 2021 to all the small lochs and lochans within 1km to assess suitability for breeding divers *Gavia sp.*, grebes *Podiceps sp.* and common scoter (*Melanitta nigra*). Note that this was a precautionary approach as the Site does not lie within the normal breeding range of red-throated diver *Gavia stellata*, black-throated diver *Gavia arctica* and common scoter within Scotland.

Lochans were surveyed in order to establish the likely presence/ absence of these species and the suitability of the habitat.

Survey methods followed those outlined in Gilbert *et al.* (1998) as per SNH (2017).

Lochans were also checked during breeding wader and raptor surveys.

9.4.5.10 Access Track Survey

An additional area of land to the west of the Site boundary, encompassing two variations to the proposed access route into Aultmore forest, was surveyed in late June – mid July 2022. The corresponding survey area encompassed each proposed access route and an associated 250m buffer.

9.4.6 Collision Risk Modelling

The standard Band CRM (Band *et. al.* 2007²) was used to estimate collision risk based on recorded target species activity levels and flight behaviour, proposed turbine numbers and specifications, and the relevant species biometrics and flight characteristics. Modelling collision risk under the Band CRM is a two-stage process. Stage 1 estimates the number of birds that fly through the rotor swept disc. Stage 2 predicts the proportion of these birds that have the potential to be hit by a rotor blade. Combining both stages produces an estimate of collision mortality in the absence of any avoidance action/behaviour by birds. Avoidance rates are then applied to generate predicted rates of collision mortality. Full details are provided in **Technical Appendix 9.2: Collision Risk Modelling Report**.

9.4.7 Assessment Methods

Chapter 5: Approach to EIA and Consultation provides further detail on the general approach to assessment. It also sets out the list of projects to be considered in the cumulative assessment and their status. The specific methodology used for this assessment is set out below.

The CIEEM Guidelines for Ecological Impact Assessment in the UK (CIEEM 2022) form the basis of the impact assessment with other relevant guidance, as listed in **Section 9.2**, referred to as appropriate. In accordance with the CIEEM guidelines, only ornithological receptors which are considered to be important, (including those required to be considered by the EIA Regulations and other relevant policies) and potentially affected by the project (i.e., the Important Ornithological

² Band, W., Madders, M. and Whitfield, D.P. (2007) Developing Field and Analytical Methods to Assess Avian Collision Risk at Wind Farms. In: De Lucas, M., Janss, G. and Ferrer, M., Eds., *Birds and Wind Power*, Quercus Editions, Madrid, 259-275.



Features or IOFs) should be subject to detailed assessment. It is not necessary to carry out detailed assessment of receptors that are not subject to legal or policy protection and are sufficiently widespread, unthreatened and resilient to project impacts and would remain viable and sustainable.

9.4.8 Assumptions, Limitations and Confidence

The validity of ornithological survey data requires that they were obtained using accepted methodologies and that surveys were carried out in suitable conditions. The field survey methodologies outlined above and described in greater detail in **Technical Appendix 9.1: Bird Survey Report** were all carried out using survey standards recommended by NatureScot and were carried out during suitable times of the year. As noted in **Section 9.3.1**, NatureScot agreed that “a second year of survey would likely generate very similar results to the first, and that this data has been gathered following all relevant guidance”.

With regard to viewshed coverage, there is a small gap in the visibility apparent in the 500m buffer of proposed turbine locations in the south-western part of the Site due to the nature of the terrain (**Technical Appendix 9.1**). Otherwise, the visibility across the eastern turbine array plus 500m buffer is good. Therefore, it is considered that the vantage point data will be representative of the Site as a whole and sufficient to inform a robust assessment of the proposed development. To avoid possible complications during any subsequent collision risk modelling, VP watches were timed such that surveys were not undertaken simultaneously from any of the VPs (as their viewsheds overlapped).

Access beyond the red-line boundary was generally not possible beyond the 500m buffer where this was on private land. This is not considered to be significant with regard to identifying raptor breeding territories, as generally these areas could be viewed from a distance.

On the basis of the above, there are considered to be no significant limitations in the data on which the assessment is based.

9.4.9 Sensitivity Criteria

Ornithological receptors should be considered within a defined geographical context so for this project the following geographic frame of reference is used:

- International
 - Species that form part of the cited interest within an internationally protected site or candidate site (for example SPA, or Ramsar site).
 - A species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being a population of the highest quality example in an international/national context that the site is likely to be designated as an SPA.
- National (i.e., Scotland)
 - Species that form part of the cited interest within a nationally designated site (for example, a SSSI or a National Nature Reserve (NNR)).
 - A population of a species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being of nature conservation value at up to a country context. This includes Wildlife and Countryside Act Schedule 1 (as amended in Scotland) species, a red- or amber- listed species (as in Birds of Conservation Concern) and a priority Scottish species.
- Regional (i.e., North East Glens Natural Heritage Zone (NHZ 12))
 - Sites supporting a regularly occurring, regionally significant number of internationally or nationally important species in the context of NHZ 12 North East Glens.
- Local (i.e., the Site plus circa 10km)
 - Populations of any species of conservation importance in the context of the local area within an approximate radius of 10km from the Site.



- Negligible
 - Commonplace species with little or no significance, the loss of which would not be seen as detrimental to the ecology of the area.

In assigning a level of value to the population of a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available.

Examples of relevant lists include:

- species of European conservation importance (as listed on Annex I of the Birds Directive);
- species with enhanced legal protection (as listed on Schedule 1 of the Wildlife and Countryside Act (as amended in Scotland));
- species considered to be of principal importance for biodiversity in Scotland, as listed on the SBL.

Criteria for evaluation include the SPA and SSSI selection guidelines published by JNCC. Reference has also been made in particular to published bird population estimates such as Wilson *et al.* (2015) for NHZs within Scotland and Woodward *et al.* (2020) for Great Britain.

Where appropriate, the value of species populations has been determined using the standard '1% criterion' method (e.g. Holt *et al.*, 2012). Using this, the presence of >1% of the international population of a species is considered internationally important; >1% of the national population is considered nationally important; etc.

9.4.10 Assessing Impacts and the Significance of an Effect

Both direct and indirect impacts are considered. Direct impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat occupied by a bird species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wetland habitats used by important bird species.

For the purposes of this ornithology assessment, in accordance with CIEEM guidelines, under the EIA Regulations, a 'significant effect' is 'one that is sufficiently important to require assessment and reporting so that the decision-maker is adequately informed as to the environmental consequences of permitting the project'.

Effects can be considered significant at a wide range of scales from international to local. For example, a significant effect on a regionally important population of a species is likely to be of regional significance. They are also significant if they do not comply with legal and policy protection.

Consideration of conservation status is important for evaluating the effects of impacts on bird species and assessing their significance. Conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area (which for the purposes of the Birds Directive is the EU).

9.4.11 Avoidance, Mitigation, Compensation and Enhancement

A sequential process has been adopted to avoid, mitigate and compensate for ornithological impacts. This is referred to as the 'mitigation hierarchy'.

The differences between avoidance, mitigation, compensation and enhancement are defined here as follows:

- avoidance is used where an impact such as disturbance or displacement of breeding IOFs e.g., through changes in scheme design;
- mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ i.e., direct habitat loss which may reduce a breeding or foraging range;



- compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and
- enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary. Such measures can be set out in species specific biodiversity action plans.

9.5 Environmental Baseline and Potential Sources of Impact

9.5.1 Current Baseline

9.5.1.1 Designated Sites

Statutory designated sites are shown in **Figure 3.1b** in **Chapter 3: Site Selection and Design Alternatives**. A brief description of each site designated in full or in part for its ornithological interest is provided in **Table 9-2** (other non-avian sites are covered in **Chapter 8: Ecology and Biodiversity**).

Table 9-2: Statutory Sites Designated for Ornithological Features within 20km

Site Name	Designation	Distance and Direction from Site	Qualifying Features / Reasons for Designation (Ornithological)	Evaluation
International Designations				
Moray Firth	SPA	5.3km NW	SPA qualifying features include: non-breeding great northern diver <i>Gavia immer</i> , red-throated diver, Slavonian grebe <i>Podiceps auritus</i> , greater scaup <i>Aythya marila</i> , common eider <i>Somateria mollissima</i> , long-tailed duck <i>Clangula hyemalis</i> , velvet scoter <i>Melanitta fusca</i> , common goldeneye <i>Bucephala clangula</i> , red-breasted merganser <i>Mergus serrator</i> and European shag <i>Gulosus aristotelis</i> .	International
Moray and Nairn Coast	SPA/ Ramsar	6.15km NW	SPA qualifying features include: Breeding osprey <i>Pandion haliaetus</i> . Non-breeding bar-tailed godwit <i>Limosa lapponica</i> , pink-footed goose <i>Anser brachyrhynchus</i> , greylag goose <i>Anser anser</i> , redshank <i>Tringa totanus</i> , red-breasted merganser, dunlin <i>Calidris alpina</i> , oystercatcher <i>Haematopus ostralegus</i> , and wigeon <i>Mareca penelope</i> . Ramsar qualifying features are: non-breeding pink-footed goose, greylag goose and redshank.	International
Tips of Corsemaul and Tom Mor	SPA	13km S	SPA qualifying species: Breeding common gull <i>Larus canus</i> .	International
Loch Spynie	SPA/ Ramsar	18km NW	SPA and Ramsar qualifying species: Non-breeding greylag goose.	International
National Designations				



Site Name	Designation	Distance and Direction from Site	Qualifying Features / Reasons for Designation (Ornithological)	Evaluation
Tips of Corsemaul and Tom Mor	SSSI	13km S	Breeding common gull (part of Tips of Corsemaul and Tom Mor SPA).	National
Gull Nest	SSSI	18km E	Breeding birds associated with the peatland habitat, in particular golden plover <i>Pluvialis apricaria</i> .	National
Loch Spynie	SSSI	18km NW	Non-breeding greylag goose (part of Loch Spynie SPA/ Ramsar).	National

9.5.1.2 Flight Activity Surveys

Full details of the flight activity (standard VP) surveys in 2021/2022 (including Figures showing flight lines) are provided in **Technical Appendix 9.1: Bird Survey Report**. A seasonal summary of 'at risk' flight activity within the Collision Risk Zone (CRZ) surrounding each of the east and west wind farm arrays is provided in **Table 9-3**. A CRZ is defined as the rotor-swept area within the Wind Farm Polygon (WP) (i.e., the area within 50m of the outermost turbine blades). Therefore, flights at risk are those at Potential Collision Height (PCH) within the WP.



Table 9-3: Summary of 'At Risk' Flights of Target Species by Season (2021 to 2022)

Species name	Wind Farm Array	Period of analysis	Total number of birds recorded in flight	Flights through WP		Flights through WP at Potential Collision Height (PCH)	
				Number of flight events	Cumulative number of birds	Number of flight events	Cumulative number of birds
Whooper swan <i>Cygnus cygnus</i>	East	Autumn 2021 (Sep-Nov)	3	1	3	1	3
	West	Spring 2021 (Mar-May)	2	0	0	0	0
Pink-footed goose	East	Spring 2021 (Mar-May)	468	9	444	3	120
		Autumn 2021 (Sep-Nov)	840	3	575	2	325
	West	Spring 2021 (Mar-May)	1554	15	802	15	802
		Autumn 2021 (Sep-Nov)	227	3	170	2	130
Greylag goose	East	Autumn 2021 (Sep-Nov)	180	6	180	5	173
	West	Spring 2021 (Mar-May)	11	1	1	1	1
		Breeding season 2021 (Apr-Aug)	2	0	0	0	0
		Autumn 2021 (Sep-Nov)	0	0	0	0	0
		Winter 2021/2022 (Dec-Feb)	6	1	6	1	6
Hen harrier <i>Circus cyaneus</i>	East	Breeding season 2021 (Mar-Aug)	2	1	1	0	0



Species name	Wind Farm Array	Period of analysis	Total number of birds recorded in flight	Flights through WP		Flights through WP at Potential Collision Height (PCH)	
				Number of flight events	Cumulative number of birds	Number of flight events	Cumulative number of birds
		Non-breeding season 2021/2022 (Sep-Mar)	1	1	1	0	0
<i>Goshawk Accipiter gentilis</i>	East	Breeding season 2021 (Mar-Aug)	5	5	5	2	2
	West	Breeding season 2021 (Mar-Aug)	7	3	4	0	0
		Non-breeding season 2021/2022 (Sep-Mar)	1	1	1	1	1
Osprey	West	Breeding season 2021 (Mar-Aug)	2	1	2	1	2
Kestrel	East	Breeding season 2021 (Mar-Aug)	6	6	6	0	0
		Non-breeding season 2021/2022 (Sep-Mar)	2	2	2	0	0
	West	Breeding season 2021 (Mar-Aug)	6	5	5	1	1
		Non-breeding season 2021/2022 (Sep-Mar)	13	3	3	1	1
<i>Peregrine Falco peregrinus</i>	West	Breeding season 2021 (Mar-Aug)	1	0	0	0	0
<i>Snipe Gallinago gallinago</i>	East	Non-breeding season 2021/2022 (Sep-Mar)	1	1	1	1	1



Species name	Wind Farm Array	Period of analysis	Total number of birds recorded in flight	Flights through WP		Flights through WP at Potential Collision Height (PCH)	
				Number of flight events	Cumulative number of birds	Number of flight events	Cumulative number of birds
Curlew <i>Numenius arquata</i>	West	Breeding season 2021 (Mar-Aug)	10	0	0	0	0
Common gull	East	Breeding season 2021 (Mar-Aug)	6	4	6	1	1
	West	Breeding season 2021 (Mar-Aug)	26	12	25	3	8



9.5.1.3 Breeding Wader Surveys

Three species of wader were recorded: lapwing (*Vanellus vanellus*), curlew and snipe. All wader activity was restricted to the 500m survey buffer (i.e., on the farmland/ open ground outside of the forest). Records were found during the early spring period only (March and April) indicating that these birds were likely commuting through the area on route to their breeding sites. There were no confirmed territories of any wader species.

9.5.1.4 Breeding Raptor Surveys

The following seven primary and secondary target raptor species were recorded: hen harrier, goshawk, sparrowhawk *Accipiter nisus*, buzzard *Buteo buteo*, osprey, peregrine and kestrel. Of these species, goshawk and kestrel were present within Aultmore forest. Although there were no confirmed breeding territories, the frequency of occurrence suggested that goshawk is a resident breeding species within the Site. This was confirmed by data provided by FLS, which indicated the presence of a goshawk nest in 2021 which was subsequently taken over by a buzzard in 2022.

The records of hen harrier, osprey and peregrine are considered to have been of birds passing through the Site only. Buzzard was recorded within the environs of the proposed access route which suggests the presence of one breeding territory in that area. In addition, FLS provided the location of two buzzard breeding locations within Aultmore forest (from 2020 and 2022).

During the breeding raptor surveys incidental records of pink-footed goose (three skeins), raven *Corvus corax* (three observations – no breeding evidence), a single red grouse *Lagopus lagopus*, and two crossbills *Loxia curvirostra* were noted.

9.5.1.5 Black Grouse Lek Surveys

No black grouse were recorded during the black grouse surveys in April and May 2021. The Site lies outside of the normal range of the species in Scotland (Forrester *et al.* 2007).

9.5.1.6 Capercaillie Transect Surveys

No capercaillie were recorded during the transect surveys in April 2021. The forest habitat within the Site consists of commercial plantings of Sitka spruce, lodgepole pine and larch with little structural diversity, and therefore is considered sub-optimal for this species.

9.5.1.7 Crested Tit Transect Surveys

No crested tits were recorded during the transect surveys in April 2021. As for capercaillie, the forest habitat is considered sub-optimal for crested tit.

9.5.1.8 Lochan Surveys

No divers, grebes or scoters were recorded during the lochan survey in June 2021. The lochans were noted as being very small, and therefore were unlikely to be suitable for species other than the smaller grebe species.

9.5.1.9 Access Track Surveys

During the two survey visits in 2022, buzzard and curlew were recorded. Although there was no indication of breeding by either species, their presence indicates that the possibility exists of the presence of breeding territories within the local area.



9.5.1.10 Collision Risk Modelling

Sufficient data³ for CRM from the Aultmore dataset 2021-2022 was available for three target species: pink-footed goose, greylag goose and common gull. The Design Freeze layout option comprises sixteen turbines in two arrays. These are treated separately and then combined to produce an overall collision risk. **Table 9-4** shows the predicted collisions risk expressed as sum of two annual rates for the two arrays. The final outputs used for the assessment are shown in bold.

Table 9-4: Summary of CRM Output for Aultmore

Species name	Array	Modelled collisions	Years per collision
Pink-footed goose	East	0.60	1.67
	West	0.84	1.19
	Combined	1.44	0.69
Greylag goose	East	0.24	4.20
	Combined	0.24	4.20
Common gull	East	0.02	54.5
	West	0.08	12.8
	Combined	0.10	10.0

9.6 Evaluation of Ornithological Features

Applying the criteria outlined in the 'Sensitivity of Features' section, **Section 9.4.9**), an evaluation of the importance of the relevant study areas for each primary target species recorded during the baseline surveys is provided in **Table 9-5** (overleaf). There are three target species with a value of 'local' which are the ones taken forward as IOFs for detailed assessment. Details on the status of other primary and the secondary target species at the Site are provided in **Technical Appendix 9.1: Bird Survey Report**.

³ Sufficient flight activity was defined as a minimum total of three flights or minimum ten individuals of each primary target species recorded in each array during each season of analysis. Numbers below these thresholds are likely to result in negligible predicted mortality. An exception was made for common gull for HRA purposes, which was recorded as a secondary species only.



Table 9-5: Evaluation of Important Ornithological Feature Populations within the Study Area

Value	IOF	Species Information, Status & Baseline	Justification
Regional	Goshawk	<ul style="list-style-type: none"> • Schedule 1; • UK BoCC Green List; • The Scottish breeding population is estimated as 130-140 breeding pairs (Forrester <i>et al.</i>, 2007 and Wilson <i>et al.</i>, 2015), and more recently 281 pairs (Challis <i>et al.</i> 2022); • The estimated population in NHZ 12, North East Glens, was 25 pairs in 2013 (Wilson <i>et al.</i>, 2015); • Baseline surveys – the cumulative total of goshawks recorded during flight activity surveys was 13 (the majority of which were during the spring (March/ April and involving single birds). All activity involved birds in flight. FLS provided the location of a nest which was within the Site in 2021. • Only 3 birds were recorded flying through the wind farm (east and west arrays combined) at potential collision risk height, which produced a negligible annual collision estimate (0.005 birds per year). 	<p>This species is not of conservation concern but is afforded special protection (Schedule 1). One pair represents 4% of the 2013 NHZ 12 estimated population, though this is likely to be a significant underestimate as it is likely to be under-recorded in commercial forestry plantations.</p> <p>With one breeding territory within 2km, one pair is considered to be of regional importance for goshawk.</p>
Local	Pink-footed goose	<ul style="list-style-type: none"> • UK BoCC Amber List; • The estimated peak abundance in Great Britain (all of which move through Scotland during migration) was 510,000 in the period 2015/16 (Woodward <i>et al.</i>, 2020); • The estimated peak abundance in NHZ 12, North East Glens, was 12,000 in the period 2009/10 to 2013/14. For additional context, the estimated peak abundance in the adjacent NHZ (North East Coastal Plain, NHZ 9) was 77,859 in the period 2009/10 to 2013/14 (Wilson <i>et al.</i>, 2015); • Baseline surveys – the cumulative total of pink-footed geese recorded during flight activity surveys was 3089 (1067 during autumn (October/ November) and 2022 in spring (March/ April) which reflects the general pattern of geese moving through the country. The mean flock size was 69 birds (peak 265). • All activity involved birds in flight, habitats on Site are generally not suitable for feeding or roosting pink-footed geese. There were no records of feeding or roosting pink-footed geese within 2km. 	<p>This species is not listed on Annex I of the Birds Directive, but is a qualifying feature of Moray & Nairn Coast SPA / Ramsar, which is within potential foraging range of the Site. The SPA qualifying population was based on the 5 year (1988/89-1992/93) mean peak of 7,538.</p> <p>Although it is an Amber-listed BoCC, the UK wintering pink-footed goose population increased by 111% between 1993/94 and 2018/19 (BTO⁴). Assuming an increase of 111% in the SPA population since designation, this gives a figure of 15,905.</p> <p>In the context of the regional populations (12,000 in NHZ 12 and 77,859 in NHZ 9) and given the pattern of Site use (i.e., only commuting through</p>

⁴ BTO birdfacts



Value	IOF	Species Information, Status & Baseline	Justification
		<ul style="list-style-type: none"> 1349 birds were recorded flying through the wind farm (east and west arrays combined) which produced an annual collision estimate of 1.67 birds per year. 	<p>the air space, with no feeding or roosting recorded within 2km), the population is assessed as of no more than local value for pink-footed goose.</p>
Local	Greylag goose	<ul style="list-style-type: none"> UK BoCC Amber List; The estimated peak abundance in Great Britain was 230,000 in the period 2012/13 to 2016/17 (Woodward <i>et al.</i>, 2020); No estimates are available for the NHZ 12, North East Glens population, or the NHZ 9, North East Coastal Plain. Loch Spynie SPA/ Ramsar: The site was designated in 1992 with a qualifying population of 8,830. The 5 year mean peak (2017/18-2021/22) for the Loch Spynie WeBS area (Austin <i>et al.</i> 2023) is 787. Moray & Nairn Coast SPA / Ramsar: the SPA qualifying population was based on the 5 year (1988/89-1992/93) mean peak of 3,023. The 5 year mean peak (2017/18-2021/22) for the Inner Moray and Beaully Firths WeBS area (Austin <i>et al.</i> 2023) is 468. Baseline surveys – the cumulative total of greylag geese recorded during flight activity surveys was 199 (180 of which were during autumn (October/ November). The mean flock size was 18 birds (peak 75 birds). All activity involved birds in flight, habitats on Site are generally not suitable for feeding or roosting greylag geese. There were no records of feeding or roosting greylag geese within 2km. 180 birds were recorded flying through the wind farm (east and west arrays combined) which produced an annual collision estimate of 0.24 birds per year. 	<p>This species is not listed on Annex I of the Birds Directive, but is a qualifying feature of two sites (Loch Spynie SPA/ Ramsar & Moray & Nairn Coast SPA / Ramsar), which are both within potential foraging range of the Site.</p> <p>The UK wintering greylag goose population increased by 28% between 1993/94 and 2018/19 (BTO). However, there has been a northerly shift in the Icelandic greylag goose wintering population, to the extent that the majority now stay on Orkney (Austin <i>et al.</i> 2023), where there are now in excess of 60,000 birds.</p> <p>Contemporary survey data for both Loch Spynie and the Inner Moray and Beaully Firths WeBS areas (Austin <i>et al.</i> 2023) indicate that these sites now hold numbers which are well below the SPA qualifying criteria.</p> <p>Given the pattern of Site use (i.e., low numbers only commuting through the air space, with no feeding or roosting recorded within 2km), the population is assessed as of no more than local value for greylag goose.</p>
Negligible	Common gull	<ul style="list-style-type: none"> UK BoCC Amber List; The Scottish breeding population is estimated as 48,100 breeding pairs (Forrester <i>et al.</i>, 2007); Baseline surveys – the cumulative total of common gulls recorded during flight activity surveys was 32 (all of which were during the breeding season (March to August)). The mean flock size was less than 2 birds (peak 6 birds). All activity involved birds in flight, there were no records of breeding, feeding or roosting common gulls within 2km. 	<p>This species is not listed on Annex I of the Birds Directive, but a qualifying feature of Tips of Corsemaul and Tom Mor SPA, which is within potential foraging range of the Site. The SPA qualifying population was based on the 1998 breeding population of 15,870.</p> <p>Due to population decline this species is an Amber-listed BoCC.</p>



Value	IOF	Species Information, Status & Baseline	Justification
		<ul style="list-style-type: none"> • The 32 birds recorded flying through the wind farm (east and west arrays combined) produced an annual collision estimate of 0.1 birds per year. 	<p>However, given the pattern of Site use (i.e., low numbers only commuting through the air space, with no breeding recorded within 2km), the study area is assessed as of no more than negligible value for common gull. Nevertheless, an assessment is provided for collision risk and barrier effects.</p>
Negligible	All other species	<p>See Technical Appendix 9.1 for baseline survey results.</p> <p>The following species which are listed as Annex I, Schedule 1 or SBL were recorded so infrequently and in such small numbers that they were scoped out of further assessment:</p> <ul style="list-style-type: none"> • Curlew <ul style="list-style-type: none"> o Listed on SBL. No at-risk flights, no confirmed territories within 500m. • Hen harrier <ul style="list-style-type: none"> o Annex I and Schedule 1 species; listed on SBL. No at-risk flights. Not breeding within 2km. • Lapwing <ul style="list-style-type: none"> o Listed on SBL. No at-risk flights, no confirmed territories within 500m. • Kestrel <ul style="list-style-type: none"> o Listed on SBL. Low level flight activity (< 3 at-risk flights). No confirmed breeding within 2km. • Osprey <ul style="list-style-type: none"> o Annex I and Schedule 1 species; listed on SBL Low level flight activity (< 3 at-risk flights). No confirmed breeding within 2km. • Peregrine <ul style="list-style-type: none"> o Annex I and Schedule 1 species; listed on SBL. No at-risk flights. Not breeding within 2km. • Whooper Swan <ul style="list-style-type: none"> o Annex I and Schedule 1 species; listed on SBL Low level flight activity (< 3 at-risk flights). 	<p>All other species are either relatively common or widespread and/or were recorded only infrequently/in small numbers and are therefore not considered important.</p>



9.6.1 Future Baseline

In the absence of the proposed development, and assuming the continuation of the current land use in the area (commercial forestry), no major changes are expected to the character of the landscape. No change in these habitats is anticipated in the short to medium term and consequently the bird community is likely to continue to be present in similar abundances and distributions.

It is more difficult to predict changes that may occur in the long-term, especially in the wake of climate change, which is thought to cause range shifts in some bird species (Huntley *et al.*, 2007). Climate change may alter habitat types by impacting the composition and health of the plant communities present, thereby affecting the habitat suitability for some of the bird species which currently occupy the Site. Baseline surveys carried out for the proposed development represent a snapshot of the bird community at the time and cannot be extrapolated to predict future population trends in the event of climate change.

9.6.2 Potential Sources of Impact

This assessment concentrates on the effects of construction, operation and decommissioning of the Proposed Development upon important ornithological features. The following potential effects have been assessed:

- habitat loss or damage (permanent and temporary) due to construction of wind farm infrastructure;
- inadvertent destruction of nests during construction;
- disturbance to birds during construction due to vehicular traffic, operating plant and the presence of construction workers;
- disturbance to birds due to the operation of the wind turbines, vehicular traffic and the presence of people during operation;
- barrier effect due to the operation of the wind turbines; and
- mortality of birds caused by collisions with turbine blades and other infrastructure.

Effects have been assessed in detail for the following ornithological features (see **Table 9-5** for justification):

- Pink-footed goose;
- Greylag goose; and
- Goshawk.

This list includes all species which are potentially vulnerable to significant effects from the proposed development, which are also:

- species for which the study area is considered to be important at a local level or above;
- species listed on Annex I of the Birds Directive;
- breeding species listed on Schedule 1 of The Wildlife and Countryside Act 1981 (as amended in Scotland); and/or
- priority species listed on the Scottish Biodiversity List.

The chapter also assesses the likely significant effect of potential impacts of the proposed development to SPAs/Ramsar sites identified in the **TA 8.7 Shadow HRA Screening**. These potential impacts are as follows;

- Moray Firth SPA: Indirect habitat degradation/disturbance, suspended sediment, toxic contamination, and invasive species (via hydrological connections between the proposed development and the Moray Firth SPA);
- Loch Spynie SPA/Ramsar: collision mortality and barrier effects;



- Moray and Nairn Coast SPA/Ramsar - collision mortality and barrier effects; and
- Tips of Corsemaul and Tom Mor SPA - collision mortality and barrier effects.

9.6.3 Embedded Mitigation and Good Practice Measures

The assessment of effects is based on the information outlined in **Chapter 2: Proposed Development Description**. The proposed development has undergone a number of design iterations and evolution in response to the constraints identified as part of the baseline studies and field studies. With respect to ornithology, no constraints have been identified during the design phase that would necessitate any changes to the proposed development.

Good practice measures in relation to pollution risk and sediment management to be adopted during the construction and operation phases are set out in **Chapter 10: Geology, Hydrology and Hydrogeology**. This includes maintaining a 50m buffer around watercourses during construction, and minimising water course crossings as part of the design process. Other general measures which will be undertaken included Site-specific drainage plans, wet weather protocols, identification of 'hotspots' where pollution is more likely to occur, and water quality monitoring throughout the construction phase. Full details of construction mitigation measures will be provided in a Construction Environmental Management Plan (CEMP), which will further outline on mitigating for pollution risks in relation to watercourses. An outline CEMP is included as **Technical Appendix 2.1: Outline CEMP**.

Good practice measures, as outlined below, would be employed to reduce the possibility of damage and destruction (and disturbance in the case of sensitive species such as breeding raptors), to occupied bird nests during the construction phase.

9.6.3.1 Timing of Works, Pre-Commencement Surveys and Implementation of Disturbance-Free Buffer Zones

Under the Wildlife and Countryside Act 1981, it is an offence, with only limited exceptions, to:

- intentionally or recklessly take, interfere with, damage or destroy the nest of any wild bird whilst it is in use or being built (applies year round for nests of birds included in Schedule A1);
- obstruct or prevent any wild bird from using its nest;
- intentionally or recklessly take, interfere with or destroy the egg of any wild bird;
- intentionally or recklessly disturb any wild bird listed in Schedule 1 while it is nest building, or at (or near) a nest containing eggs or young, or disturb the dependent young of such a bird;
- intentionally or recklessly harass any wild bird included in Schedule 1A; or
- knowingly cause or permit any of the above acts.

Avoidance of damage to, or destruction of nests, or disturbance to sensitive species whilst nesting can be achieved through careful timing of construction activities; for example restricting activities in sensitive areas as far as practicable in the early part of the breeding season until the location and breeding status of nesting birds has been established. If Site clearance and construction activities are required to take place during the main breeding bird season, from mid-March to August inclusive, pre-commencement survey work would be undertaken to ensure that nest destruction and disturbance to sensitive species (i.e., breeding raptors and waders) are avoided. Where applicable, construction would not take place within specified disturbance-free buffer zones for certain sensitive species during the breeding season.

Disturbance-free buffer zones around nest sites of sensitive species would be applied and monitored closely. For breeding waders, disturbance-free buffer zones are only required until chicks have hatched and are capable of walking away from any sources of disturbance.



Based on 2021 survey data and the relevant literature (e.g., Goodship and Furness 2022), the following disturbance-free buffer zone is considered likely to be required to help prevent nest failure due to disturbance during construction. It should be noted that this represents a guide only and may vary according to topography and other factors at each nest site.

- goshawk – 300-500m.

9.6.3.2 Environmental Clerk of Works

A suitably qualified Environmental Clerk of Works (EnvCoW) would be employed to oversee activity at key points for the duration of the construction and reinstatement periods (at a frequency to be agreed with Moray Council and NatureScot), to ensure natural heritage interests are safeguarded (See **Chapter 8 Ecology and Biodiversity** for further details). The role of the EnvCoW would include the following specific roles with regard to the ornithology interest of the Site:

- prior to the start of construction and/or the breeding bird season, the EnvCoW would make contractors aware of the ornithological sensitivities within the Site (particularly with regard to the potential presence of sensitive breeding species, i.e. breeding waders and raptors);
- the EnvCoW would undertake surveys for nesting birds throughout the construction period that falls within the nesting season and set up and monitor appropriate exclusion areas whilst nests of relevant species are in use;
- the EnvCoW will ensure that that best practice pollution prevention measures in regards to the water environment are followed on Site; and
- the EnvCoW will ensure that best practice is followed in regards to any invasives species on Site, to help ensure that these do not spread which will protect bird habitat in the locality including designated sites.

9.7 Assessment of Potential Effects

9.7.1 Construction Effects

Potential effects, assuming that the good practice mitigation measures outlined in **Section 9.6.3** are implemented, are addressed for each important feature in turn.

9.7.1.1 Nest Damage or Destruction

Damage or destruction to active nests could contravene the Wildlife and Countryside Act 1981 (as amended in Scotland). However, the good practice measures would avoid the likelihood of damage, destruction or disturbance to occupied bird nests during the construction phase. As such, no significant effects are predicted for any species due to nest damage or destruction.

9.7.1.2 Habitat Loss

Construction of turbine bases, access tracks and other structures would lead to habitat loss (see **Chapter 8: Ecology and Biodiversity, Table 8-9**). There will be loss (c.158.8ha) relating to felling of plantation forestry habitat of which there is an abundance within the study area (c.2,019ha) and its environs, some of which will be subsequently replanted resulting in a permanent loss of c.149ha. Other habitat loss amounts cumulatively to less than 2ha of six habitat types (*Deschampsia* neutral grassland (g3c7), Other Neutral Grassland (g3c), Dense scrub (h3), Degraded Blanket Bog (f1a6), Purple moor grass and rush pasture (f2b) and f2c Upland flushes, fens and swamps).

Habitat loss is only likely to affect important species breeding within the study area, which are likely to use these habitats for nesting and foraging (i.e., goshawk).



- Goshawk
 - Goshawks are tree nesting raptors which occupy their home range all year, and hunt over both open areas and within woodland taking a large and varied range of prey species (Kenward, 1996). They may breed in the same locality for a number of years (Hardey *et al.*, 2013). The 2021 nest location does not appear to have been used previously or since, and was subsequently taken over by a buzzard. It is approximately 750m from the nearest proposed turbine location and approximately 200m from the nearest access track and therefore will be unaffected.
 - In the event that a previously unidentified nest site is felled as part of the buffer around a proposed turbine to form part of the turbine 'keyhole', that nest location would be lost, and part of that coupe would no longer be of use to the birds seeking to nest there. However, there are a number of other areas within the nearby forest which have trees of a similar age. Goshawk are known to be able to move up to 2.5km to another nest site if disturbed (Petty & Anderson 1996), there is therefore the strong possibility that the pair from this territory could establish another nest elsewhere in the forest.
 - Even if they were unable to move nest location and this territory was temporarily lost to the regional population, the effect of this habitat loss would be assessed at worst case regionally significant if permanent. However, similar to nests lost during harvesting in forests undergoing normal crop rotation regimes, suitable goshawk nesting habitats would return as tree coupes mature elsewhere in the forest plantation. Hence, it is considered that there would be **no significant effect** on the conservation status of goshawk in terms of habitat loss caused by the proposed development.

9.7.1.3 Disturbance/Displacement

During the construction stage of the proposed development, the potential effects of associated noise and visual disturbance could lead to the temporary displacement or disruption of breeding and foraging birds. The level of impact would depend on the timing of potentially disturbing activities, the extent of displacement (both spatially and temporally) and the availability of suitable habitats in the surrounding area for displaced birds to occupy.

Potential effects are likely to be greatest during the breeding season (predominantly between March and August, depending on the species under consideration) and behavioural sensitivity to the effects would vary between species.

Disturbance of birds due to construction activities of this type have not been sufficiently quantified in the literature and the available information is often contradictory. However, it is likely that construction impacts would be greater on species that are intolerant of noise and other sources of disturbance. Larger bird species, those higher up the food chain or those that feed in flocks in the open tend to be more vulnerable to disturbance than small birds living in structurally complex or closed habitats such as woodland (Hill *et al.*, 1997).

The potential effects associated with construction activities are only likely to occur for as long as the construction phase continues and are thus generally short-term in nature. The exception to this would be if a negative effect on the breeding success of a feature were such that the local population becomes extinct and replacement through recruitment or re-colonisation does not occur. For example, a study by Pearce-Higgins *et al.* (2012) found that snipe and curlew densities declined significantly on wind farms during construction and had not recovered by the first year post-construction.

Disturbance/displacement effects during construction are only likely to affect species potentially breeding within the relevant parts of the study area (i.e., goshawk only).

Construction disturbance can be readily mitigated by avoiding sensitive areas through the implementation of appropriately defined buffer zones and by timing construction activities to avoid periods where sensitive species are present (if and where possible), such as the breeding season. A range of good practice measures have therefore been proposed to mitigate for potential construction disturbance effects (**Section 9.6.3**).



- Goshawk
 - As discussed in **Section 9.7.1.2**, one nest location was identified approximately 750m from the nearest proposed turbine. This is beyond the upper limit of the active disturbance distance of 500m, cited by expert opinion in Goodship and Furness (2022). However, the proposed access road does lie within this disturbance (approximately 200m at the nearest point). Goshawks have been observed as being fairly tolerant of human disturbance, depending on the degree of habituation (Rutz *et al.*, 2006; Goodship and Furness 2022), with birds living close to urban fringes and successfully rearing chicks close to logging activities. Conversely, they can be susceptible to disturbance at particular periods during the breeding cycle (Hardey *et al.* 2013). Therefore, any nesting attempts by goshawk would be safeguarded under a Bird Protection Plan (BPP), in compliance with legislative requirements to avoid disturbance to the sites of specially protected birds.
 - Foraging goshawks could be displaced from habitat in the vicinity of construction activities and, in theory this could lower foraging efficiency, leading to short-term adverse effects on breeding productivity or survival. However, goshawk hunting ranges are large with respect to the area occupied by the proposed Development, with ranges recorded up to 6km (Cramp & Simmons, 1980). In addition, it is thought that breeding numbers is limited by food availability and suitable nesting habitat (Rutz *et al.*, 2006). Goshawks prey on a wide variety of medium to large bird species such as woodpigeon *Columba palumbus*, which are generally common if not abundant, in the wider countryside. Therefore it is considered that the availability of food within the home range, would compensate for the short-term loss of foraging habitat within the proposed development during construction.
 - In summary, a worst case scenario is that the goshawks are displaced to hunt elsewhere for the short time period during construction of the proposed development. With goshawk nesting attempts being safeguarded through the BPP and foraging efficiency by breeding birds unlikely to be affected by construction activities, the short-term adverse impact of construction on breeding goshawk would be spatially negligible. Hence, it is considered that there would be **no significant effect** on the conservation status of goshawk in terms of disturbance/ displacement caused by construction of the proposed development.

9.7.2 Operational Effects

9.7.2.1 Habitat Loss and Modification

Permanent habitat modification includes the maintenance of the open areas surrounding the wind farm infrastructure and tracks within the forest plantation plus the areas undergoing habitat enhancement relating to the BERP.

- Goshawk
 - A long-term study in European forests did not find any difference in the breeding success of goshawks in logged and unlogged stands, provided the original stand structure was altered by less than 30 % (Penteriani & Faivre, 2001). In the long term the creation of age diversity within the forest as a whole means that when areas are mature and harvested, other areas of younger forest, not yet ready for felling, would be available for goshawks to move into.
 - The land take is of negligible effect spatially in the context of the larger home range of this species. They would be able to make use of the altering forest structure during the normal life span of the forest rotation. The permanent adverse impacts of operational Habitat Loss and Modification on goshawk would be spatially negligible. Hence, it is considered that there would be **no significant effect** on the conservation status of goshawk because of habitat modification caused by the proposed development.



9.7.2.2 Disturbance/ Displacement

The operation of wind turbines and associated human activities for maintenance purposes also has the potential to cause disturbance and displace birds from the Site. Disturbance effects during the operational phase may be less than during the construction phase, as species may become habituated to wind turbines and disturbance due to human activities would be considerably reduced.

Studies have shown that, in general, species are not disturbed beyond 500m to 800m (for the most sensitive species) from wind turbines (e.g. Drewitt and Langston, 2006 and references therein; Hötter *et al.*, 2006; Pearce-Higgins *et al.*, 2009) and, in some cases, birds do not appear to have been disturbed at all (e.g. Devereux *et al.*, 2008; Whitfield *et al.*, 2010; Douglas *et al.*, 2011; Fielding and Haworth, 2013).

The evidence suggests that impacts vary between species and sites (see discussion for raptors; Madders & Whitfield, 2006). There is potential for some disruption of feeding and nesting due to increased human activity for maintenance purposes. However, this would be relatively infrequent, involve low levels of disturbance and would be restricted to areas of the Site accessible by tracks. Therefore, the overriding source of disturbance and displacement of birds during the operational period is considered to be the operating turbines (Pearce-Higgins *et al.*, 2009).

- Goshawk
 - o Similar to operational Direct Habitat Loss, if displacement of goshawk due to the presence of the turbines was to occur this would most probably result in loss of a relatively small area of the overall potential nesting and foraging habitat for this species. New nesting areas elsewhere in the forest are likely to be available and would also mature through the normal forest rotation. Foraging habitats currently exist all around and within the forest, and only a small amount would be directly lost to the turbines and other infrastructure. Currently one pair has nested within 300m of an existing public road, therefore they are presumably tolerant of the low level of disturbance which already exists. This pair must also be tolerant of the disturbance which occurs in the forest due to the regular forestry works. The likely outcome is that the pair which currently nests in the forest would continue to do so.
 - o Currently, there are no goshawk nests closer than 750m from any proposed turbine, which is beyond the distance that this species is likely to be displaced. In the unlikely event that this pair is displaced and cannot relocate to a new nest location the adverse impact on the regional goshawk population would be at worst regionally significant and permanent. However, it is considered that this is very unlikely given the availability of alternative habitat remaining within the forest. Hence, it is considered that there would be **no significant effect** on the conservation status of goshawk in terms of disturbance/displacement caused by the proposed development.

9.7.2.3 Barrier Effect

Individual turbines, or a wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population is subtle and difficult to predict with any degree of certainty. If birds regularly have to fly over or around obstacles or are forced into suboptimal habitats, this may result in reduced feeding efficiency and greater energy expenditure. By implication, this will reduce the efficiency with which they accumulate reserves, potentially affecting breeding success or survival.

- Pink-footed Goose and Greylag Goose
 - o Baseline surveys showed that the air space around the Site for is used by migrating or commuting pink-footed and greylag geese. However, given the relatively small scale of the development in comparison with the areas through which migrating geese move through, it is unlikely that this sixteen-turbine development will have more than negligible effect distances flown by the geese and therefore on goose populations.



There are no sites used for roosting or feeding that would have access restricted by any potential barrier effects.

- Common gull (included as qualifying feature of Tips of Corsemaul and Tom Mor SPA)
 - o During the 2021/22 ornithological surveys on Site a total of 17 common gull flights were recorded during the breeding season from March-August with a maximum of six birds present during a flight. Common gulls were generally observed circling and no flight corridors were identified. The low overall count of common gull flightlines through the Site, indicates that the Site is not within a favoured commuting route for this species.

Hence, it is considered that there would be **no significant effect** on the conservation status of pink-footed geese, greylag geese, and common gull in terms of barrier effects caused by the proposed development.

9.7.2.4 Collision with Wind Turbines

Collision of a bird with turbine rotors is almost certain to result in the death of the bird. In low density populations (e.g., raptors) this could have a greater negative effect on the local population than in higher density populations (e.g., passerines) because a higher proportion of the local population would be affected in a low-density population. Larger birds such as raptors also live longer and have much slower reproductive rates than passerines, which can also increase the significance of the impact of collisions on the relevant population. The frequency and likelihood of a collision occurring depends on a number of factors which include aspects of the size and behaviour of the bird (including their use of a site), the nature of the surrounding environment, and the structure and layout of the wind turbines.

Collision risk is perceived to be higher for birds that spend much of the time in the air, such as foraging raptors and those that have regular flight paths between feeding and breeding/roosting grounds (e.g. geese). The risk of bird collisions at wind farms is greatest in areas where large concentrations of birds are present (such as on major migration routes), and in poor flying conditions, such as rain, fog, strong winds that affect birds' ability to control flight manoeuvres, or on dark nights when visibility is reduced (Langston and Pullan, 2003; Drewitt and Langston, 2006 and references therein). Birds may also be more susceptible if the wind farm is located in an area of high prey density. For diurnal foraging raptors, the proximity of structures on which to perch can increase the likelihood of collision with wind turbines (e.g. Percival, 2005 and references therein).

It should be noted that operational disturbance and collision risk effects are mutually exclusive in a spatial sense; i.e. a bird that avoids the wind farm area due to disturbance cannot be at risk of collision with the turbine rotors at the same time. However, they are not mutually exclusive in a temporal sense; i.e. a bird may initially avoid the wind farm but habituate to it, and would then be at risk of collision.

Passerines nesting within a wind farm site would be expected to be regularly flying between wind turbines and could therefore be expected to be most at risk of collision. However, passerines tend to fly below PCH and evidence suggests that passerines collide with wind turbines infrequently. Moreover, most of the species concerned are of low or negligible conservation value. Collision is therefore mainly considered in relation to species of high sensitivity, e.g., target raptor species and species not particularly manoeuvrable in flight, such as geese and swans.

Species with sufficient data (minimum of five flights per season and/or minimum of 10 birds) to undertake CRM are considered at risk of collision with the proposed wind turbines at the Site. The species that met this criterion and were subject to CRM are as follows:

- pink-footed goose; and
- greylag goose; and
- common gull.



CRM was conducted for common gull in order to assess potential impacts on the Tips of Corsemaul and Tom Mor SPA, (**Table 9-2**) due to it being the only qualifying feature for this Site. Results are presented in **Table 9-4**. Common gull is not considered an IOF due to its low Site use, however, the assessment below includes this species for sake of completeness.

For all other species, the number of flights within the CRZ, i.e., flights through the WP at PCH, (including goshawk) was so low that collision risk is considered negligible.

- Pink-footed Goose
 - The pink-footed goose flight activity survey data for the proposed development is shown on **Figure 9.1.3 (Technical Appendix 9:1)**. Pink-footed goose was recorded commuting over the Site during the months of March, April, October and November. The majority of flights followed a north/ south or south/ north orientation and varied in height between approximately 20m to >200m above ground level.
 - The peak in flight activity occurred during spring (March – April) when 36 flight events were recorded, with a cumulative total of 2,022 birds counted, which equates to a mean flock size of 56.2. In autumn (October – November), there were 9 flight events recorded with a cumulative total of 1,067 birds counted, which equates to a mean flock size of 118.6.
 - Collision risk analysis has been carried out on flight activity data from the spring and autumn periods, for each of the arrays. Assuming a 99.8% avoidance rate, there was an annual collision rate of 0.6 birds for the eastern array and an annual rate of 0.84 birds for the western array predicted. This amounts to a combined annual estimate of 1.44 birds (approximately one collision every 0.69 years).
 - In terms of background mortality for NHZ 12, in relation to a population of 12,000 birds (Wilson *et al.*, 2015), background mortality is given by the BTO (BTO birdfacts⁵) as 0.171 for adults (equating to a background mortality of 2,052 birds, assuming all adults) and 0.225 for juveniles (to age 3) (equating to 2,700 birds, assuming all birds <age 3). Using the worse case scenario of all mortality affecting adults, the increase of 1.44 birds represents an increase of 0.07% on background mortality. Using the least worse case scenario of all mortality affecting young birds, the increase of 1.44 birds represents an increase of 0.05% on background mortality.
 - In terms of background mortality for the Moray and Nairn Coast SPA, in relation to an SPA population of 15,905 birds (using the figure in **Table 9-5**), using 0.171 for adults (equating to 2,720 birds, assuming all adults) and 0.225 for juveniles (to age 3) (equating to 3,579 birds, assuming all birds <age 3). Using the worse case scenario of all mortality affecting adults, the increase of 1.44 birds represents an increase of 0.05% on background mortality. Using the least worse case scenario of all mortality affecting young birds, the increase of 1.44 birds represents an increase of 0.04% on background mortality.
 - According to the ongoing German (Brandenburg state) review of bird collisions with turbines in Europe, there has been only one recorded pink-footed goose fatality, in Denmark (Dürr, 2023). It should be noted that collisions are most likely underreported as not all countries monitor and share their collision fatalities data.
 - Based on the above, it can be concluded that collision risk would be low for this species in the context of the proposed development. On the basis of 30-40 predicted pink-footed goose collisions during the lifetime of the proposed development, this is considered **not significant** at the NHZ level.

⁵ <https://www.bto.org/understanding-birds/birdfacts/pink-footed-goose>



- Greylag Goose
 - The greylag goose flight activity survey data for the proposed development is shown on **Figure 9.1.4 (Technical Appendix 9:1)**. Greylag goose was recorded commuting over the Site during the months of March, April, June, October, November and December. The majority of flights followed a north/ south or south/ north orientation and varied in height between approximately 10m to 130m above ground level.
 - The peak in flight activity occurred during autumn (October – November) when 6 flight events were recorded, with a cumulative total of 180 birds counted, which equates to a mean flock size of 30 birds. Otherwise, numbers were low, with a mean flock size of 4 birds during the rest of the year, which did not warrant modelling.
 - Collision risk analysis has been carried out on flight activity data from the autumn period, for the eastern array. Assuming a 99.8% avoidance rate, there was an annual collision rate of 0.24 birds for the eastern array and a negligible rate for the western array predicted. The combined annual estimate of 0.24 birds amounts to approximately one collision every 4.2 years.
 - In terms of assessing this mortality for the regional population, NHZ population estimates are not given in Wilson *et al.* 2015. For both relevant SPAs (Loch Spynie and Moray and Nairn Coast), the original qualifying population estimates are out of date, due to the northerly shift in the Icelandic greylag goose wintering population in the UK. It is also not possible to estimate the proportion of local birds and Icelandic breeders affected. Using the contemporary WeBS data instead, (see **Table 9-5**), in relation to the current Loch Spynie population of 787 birds, using 0.17 for adults (equating to 130 birds, assuming all adults) and 0.44 for juveniles (to age 3) (equating to 337 birds, assuming all birds <age 3). Using the worst case scenario of all mortality affecting adults, the increase of 0.24 birds represents an increase of 0.18% on background mortality. Using the least worst case scenario of all mortality affecting young birds, the increase of 0.24 birds represents an increase of 0.07% on background mortality.
 - According to the ongoing German (Brandenburg state) review of bird collisions with turbines in Europe, there have been 35 recorded greylag goose fatalities, with none in the UK (Dürr, 2023). As above, it should be noted that collisions are most likely underreported as not all countries monitor and share their collision fatalities data.
 - Based on the above, it can be concluded that collision risk would be low for this species in the context of the proposed development. On the basis of 6 predicted greylag goose collisions during the lifetime of the proposed development, this is considered **not significant** at the NHZ level.
- Common Gull
 - Common gull was recorded on passage or commuting over the Site only, during the months of March, April, June and August. flights were in height bands 1 and 2 (between approximately >0m to 180m above ground level).
 - The peak in flight activity occurred during spring (March – April). Numbers were low, with a cumulative total of 32 and mean flock size of 1.9 birds.
 - The estimated annual collision rate for common gull using the default avoidance rate 98.0% indicate a maximum of 0.02 birds per annum for the eastern array and 0.08 birds per annum for the western array. The combined annual estimate of 0.10 birds amounts to approximately one collision every 10.0 years.



- o In terms of assessing this mortality for the regional population, NHZ population estimates are not given in Wilson *et al.* 2015. In terms of survival rates in relation to the Tips of Corsemaul and Tom Mor SPA population of 15,870 birds, background mortality is given by the BTO (BTO BirdFacts) as 0.14 for adults (equating to 2,222 birds, assuming all adults) and 0.75 for juveniles (to age 3) (equating to 11,903 birds, assuming all birds <age 3). Using the worst case scenario of all mortality affecting adults, the increase of 0.10 birds represents an increase of 0.005% on background mortality. Using the least worst case scenario of all mortality affecting young birds, the increase of 0.10 birds represents an increase of 0.0008% on background mortality.
- o According to the ongoing German (Brandenburg state) review of bird collisions with turbines in Europe, there have been 91 recorded common gull fatalities, with none in the UK (Dürr, 2023). As above, it should be noted that collisions are most likely underreported as not all countries monitor and share their collision fatalities data.
- o Based on the above, it can be concluded that collision risk would be low for this species in the context of the proposed development. On the basis of 2-3 predicted common gull collisions during the lifetime of the proposed development, this is considered **not significant** at the NHZ level.

9.7.3 Decommissioning Effects

Potential effects associated with decommissioning of the proposed development are assumed to be similar to those identified for construction phase (i.e., habitat loss and disturbance/displacement). Decommissioning effects are therefore not considered separately for each species.

Due to the length of the operational period (35 years) the future composition of the bird community at the Site is not known and the confidence in any prediction would be uncertain. In the absence of mitigation, decommissioning could cause short term effects through disturbance. Positive effects however, might also occur through the removal of turbines and the reinstatement of topsoil. Good practice measures, similar to those employed during the construction phase, including surveys prior to decommissioning, to inform an up-to-date assessment of potential effects on important bird species, would be implemented during decommissioning. Following the implementation of these measures, no significant effects would be anticipated.

9.8 Mitigation

During the construction and decommissioning phases, good practice guidelines outlined in the BPP and CEMP, along with the EnvCoW supervision will mitigate for any impacts such as destruction and disturbance, as well as impacts on the water environment.

No specific mitigation measures are required for the operational phase. However, compensation and enhancement measures are proposed in the form of the Biodiversity Enhancement and Restoration Plan (BERP), which would remain in place during the operational phase.

An Outline Biodiversity Enhancement and Restoration Plan (OBERP) has been prepared and is available in **Technical Appendix 8.6: OBERP**. A detailed BERP would be prepared post consent, which will focus on increasing the area of native woodland, bog restoration and heath restoration, in order to provide nature conservation enhancements that would apply for the lifetime of the proposed development with positive effects felt thereafter. The increase in these habitats therefore has the potential to increase the amount of breeding and foraging habitat for some bird species.

Further details of measures to be included in the BERP to benefit habitats and non-avian species are included in **Chapter 8: Ecology** and **Technical Appendix 8.6: OBERP**.



9.8.1 Further Survey Requirement and Monitoring

It is proposed in the OBERP that bird surveys should be undertaken annually during the breeding season (April to July inclusive for open areas, March to June for forested areas where there is potential for goshawk) for three years after works have taken place then every five years to monitor goshawk presence and use of forested areas and use of newly created open ground on the Site by protected species. Open ground monitoring should focus particularly on species that may breed in these areas such as hen harrier, snipe and curlew, which are vulnerable to collision with wind turbines. Monitoring should take place at the same time every year.

9.9 Assessment of Cumulative Effects

The following section assesses the potential cumulative effects on IOFs from the proposed development along with all other operational, consented and submitted plans or projects within an appropriate zone of influence and against the relevant NHZ population estimates, following NatureScot guidance (SNH, 2018c).

In line with this guidance, any wind farm developments of fewer than three turbines (small scale wind energy proposals (SNH, 2016d)) were excluded from the cumulative impact assessment, due to the problems associated with finding appropriate data for developments of this size. Only IOFs for which a greater than negligible residual impact is predicted are considered in the cumulative impact assessment, as unquantified negligible impacts will not result in a detectable increase in cumulative impacts.

All existing, consented and submitted wind farm developments (of three or more turbines) and other projects identified within NHZ12, were considered as part of the assessment of cumulative impacts (these are shown in **Table 9-6**).

For the cumulative effects of the potential impact on bird habitat via hydrological means during construction, the potential for significant cumulative effects would be via the discharge of particulate matter into watercourses, or through a pollution incident. Wind farms which are already operational are not likely to give rise to significant cumulative effects through operation as infrastructure would be in place and only occasional service vehicles would be present on the Site. The cumulative effect was considered on the bird habitat via hydrological means within a 10km buffer of the Moray Firth SPA for reasons outlined in Section 9.6.2.



Table 9-6: Projects Considered for Cumulative Effects Assessment

Project	Status	Distance/ Direction from Proposed Development (km)	No. of Turbines	Information Available	Species Assessed
Myreton Crossroads	Operational	2.7	3	None	-
Lurg Hill	Consented	2.9	5	Lurg Hill Wind Farm Chapter 13: Ecology and Ornithology (Vento Ludens, 2017).	Goshawk Greylag goose Pink-footed goose
Edintore	Operational	8.4	6	None	-
Hill of Towie I	Operational	8.9	21	No wintering bird surveys; no CRM carried out (proposals pre-dated current NatureScot guidelines regarding CRM).	-
Hill of Towie II	Consented	11.0	16	Planning documents	Pink-footed goose Greylag goose
Cairnborrow	Operational	14.5	5	None	-
Boyndie	Operational	14.6	7	None	-
Garbet	Consented	19.6	7	None	-
Craig Watch	Application	20.1	10	None	-
Clashindarroch II	Consented	22.1	14	Planning documents	Pink-footed goose Goshawk
Clashindarroch Extension	Application	24.5	22	Planning documents	Common gull Goshawk
Meikle Hill	Operational	26.5	9	None	-
Clashindarroch	Operational	24.7	18	Planning documents	(Common gull only)



Project	Status	Distance/ Direction from Proposed Development (km)	No. of Turbines	Information Available	Species Assessed
Cairmore Farm	Operational	30.9	3	None	-
Kildrummy	Operational	33.8	8	None	-
Cornabo	Consented	43.5	3	None	-
Craigneil Hill	Consented	68	11	Planning documents	Pink-footed goose Greylag goose Goshawk
Mid Hill I	Consented	79	25	Planning documents	Goshawk
Glen Dye	Application	85	26	Planning documents	-
Welton of Creuchies (Alyth)	Operational		4	Planning documents	-
Drumderg	Operational		16	None	-
Tullymurdoch	Operational		7	Planning documents	-



Potential cumulative effects from the proposed development include potential habitat loss for goshawk and potential collision mortality for pink-footed goose and greylag goose.

9.9.1 Goshawk

No sites in addition to the proposed development recorded goshawk as potentially breeding within 1km. As such no habitat loss impacts are predicted in addition to those already anticipated for the proposed Wind Farm development, and therefore **no significant cumulative impacts** are predicted. Note that nests are lost during harvesting in forests undergoing normal crop rotation regimes, and suitable goshawk nesting habitats return as tree coupes mature elsewhere in forest plantations.

9.9.2 Pink-footed and Greylag Goose

Collision rates for pink-footed goose and greylag goose from the cumulative wind farm projects and the proposed development are presented in **Table 9-7**. Note that at this stage none of the projects listed have progressed beyond being consented.

The cumulative totals are then assessed with reference to the background mortalities referenced in **Section 9.7.2.4**.

Table 9-7: Summary of Cumulative Effects – Collision Mortality (Collisions per Year)

Project	Pink-footed goose	Greylag goose
Proposed Development	1.44	0.24
Clashindarroch II	0.25	0
Craigneil	1.91-3.39	0.01
Hill of Towie II	0.02	0
Cumulative Total	3.62-5.10	0.25

- Pink-footed goose
 - In terms of background mortality for NHZ 12, in relation to a population of 12,000 birds (Wilson *et al.*, 2015), with the worst case scenario of all mortality affecting adults, an increase of 5.1 birds represents an increase of 0.25% on background mortality. Using the least worst case scenario of all mortality affecting young birds, an increase of 5.1 birds represents an increase of 0.19% on background mortality. This is considered **not significant** at the NHZ level.
- Greylag goose
 - As there is no reference population for the NHZ, in relation to the current Loch Spynie population of 787 birds, the increase of 0.25 birds represents an increase of 0.18% on background mortality for adults, and an increase of 0.07% on background mortality for birds <3 years old. This is considered **not significant** and is also not likely to be significant at the NHZ level.

It is assumed that wind farms within 10km of the Moray Firth SPA will implement good practice pollution prevention and appropriate precautions for invasive species. It is therefore, expected that **no negative significant effect** in regard to the bird habitat via hydrological means is likely to occur.

9.10 Screening for Appropriate Assessment

Under the Conservation (Natural Habitats, &c.) Regulations 1994, as amended (the Habitats Regulations) any development that may have a likely significant effect (LSE) on an SPA or Special Area of Conservation (SAC), either alone or in combination with other projects, requires an Appropriate Assessment (AA) to be carried out by the relevant competent authority, to determine whether or not the development would have an adverse effect on the integrity of the SPA or SAC.



Before an AA is initiated, a screening process is undertaken to determine whether any of the predicted impacts of the development would result in a LSE. This screening assessment is presented in **Technical Appendix 8.7: Shadow HRA**, to provide information to the competent authority to allow them to reach a decision on whether or not the development would have a LSE on any SPA or SAC and therefore whether an AA is required.

The screening considered the potential for the proposed development to impact the Moray and Nairn Coast SPA/Ramsar, Tips of Corsemaul and Tom Mor SPA, Loch Spynie SPA/Ramsar and the Moray Firth SPA. It was concluded that AA is needed for LSEs on Moray Firth SPA for indirect habitat degradation/disturbance; suspended sediment, toxic contamination, and invasive species via hydrological connections to the proposed development. AA on the other three designated sites is required due to the LSEs of collision mortality and barrier effects for wintering pink-footed and greylag geese and breeding common gull populations associated with these SPAs.

Precautions outlined in this chapter regarding EnvCoW and best practice guidelines regarding pollution and the water environment outlined in **Chapter 8 Ecology and Biodiversity** and **Chapter 10 Geology, Hydrology and Hydrogeology** provides relevant mitigation for hydrological related pressures (indirect habitat degradation/disturbance; suspended sediment, toxic contamination, and invasive species) on the Moray Firth SPA. With regards to the water environment, **Chapter 8** concludes that *'assuming that best practice pollution prevention measures are adopted, no significant effect is predicted on the running water environment.'* Following the same reasoning this chapter has concluded that **no negative significant** effect on bird habitat via hydrological connection (including for invasives) on the Moray Firth SPA is expected.

This chapter identified only negligible effects were considered possible for the collision mortality and barrier effects for greylag goose, pink-footed goose and common gull. Taking into consideration the findings of the assessment in this chapter, the proposed development, alone or in combination with current plans and projects, will not result in a likely significant effect on the integrity of the Moray and Nairn Coast SPA/Ramsar, Tips of Corsemaul and Tom Mor SPA and Loch Spynie SPA/Ramsar.

9.11 Summary

No significant residual effects are anticipated for any receptor. A summary of the assessment of the effects of the proposed development, proposed mitigation and the residual effects are provided for each receptor in **Table 9-8**.

Table 9-8: Summary of Residual Effects

Impact	Receptor	Mitigation Measures	Means of Implementation	Residual Effect
Nest damage or destruction during construction	All species	Implementation of good practice, through CEMP and BPP	Timing of Works, Pre-Commencement Surveys and Implementation of Disturbance-Free Buffer Zones	No significant negative effects
Direct habitat loss and change	All species	None required	-	No significant negative effects
Disturbance/displacement during construction	All species, including goshawk	Implementation of good practice. Disturbance free zone of 300-500m around any goshawk nests	Timing of Works, Pre-Commencement Surveys and Implementation of Disturbance-Free Buffer Zones	No significant negative effects
Disturbance/displacement during operation	All species, including goshawk	Operational monitoring	Breeding bird surveys	No significant negative effects



Impact	Receptor	Mitigation Measures	Means of Implementation	Residual Effect
Collision with turbines and barrier effects during operation	All species including pink-footed goose and greylag goose	None required	-	No significant negative effects
Impact on bird habitat vis hydrological means.	Important bird habitat connected via hydrological means (including Moray Firth SPA).	Strict adherence to the SEPA guidelines on pollution prevention. Avoiding working within 50m of watercourses where possible.	EnvCoW overseeing works. Water monitoring (detailed in Chapter 10). Following guidelines and measures outlined in CEMP and Chapter 10 to safeguard water environment.	No significant negative effects



9.13 References

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