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10. ORNITHOLOGY

10.1 Executive Summary

10.1.1 The aim of this Chapter is to assess the effect of the Proposed Varied Development on birds on the open ground, those in the forested areas and those flying over the Proposed Varied Development site against potential construction, operational (including collision risk) and decommissioning effects. This chapter's assessment is undertaken under the 2017 EIA Regulations which require inclusion in the EIA Report of the main respects in which it is considered that the likely significant effects on the environment of the Proposed Varied Development would differ from those described in the 2015 ES and 2016 FEI Report prepared in connection with the relevant section 36 consent. The proposed variations principally relevant to this chapter are increased tip height and blade length (from which stem implications for collision risk), plus lower habitat loss (a benefit of fewer turbines and infrastructure).

10.1.2 Birds breeding on the Consented Development were surveyed in 2009 and spring 2012 and spring 2013, covering a buffer of 500m around the site. The results were supplemented by historical data (pre-2012) and concurrent monitoring data from the adjacent Gordonbush Wind Farm. Based on these data, no bird species listed on Annex 1 of the Birds Directive or on Schedule 1 of the Wildlife and Countryside Act were found to be resident within the site survey area, and no raptors were found to be breeding within 2km of the site boundary. Furthermore, no qualifying species of the nearby Caithness and Sutherland Peatlands Special Protection Area (SPA) was found to be using the Development site. In pre-application discussions Scottish Natural Heritage (SNH) confirmed that they did not require additional bird survey work to be carried out for the preparation of this EIA Report (Appendix 6.1: Pre-Application Advice Pack). A Habitat Regulations Assessment was however, requested.

10.1.3 The bird species found breeding in the survey area were considered to be of Local or Low conservation value, with the exception of the skylark, which was considered to have a site population of Regional conservation value. The potential negative effects of construction and operation of the Consented Development, through habitat loss and disturbance (outside the bird breeding season), were considered to be of low magnitude and not significant in the 2015 ES and 2016 FEI Report. During the bird breeding season (April to July), the potential negative effects of construction through disturbance and risks to birds' nests were also considered in these documents and found to be of medium magnitude and significant in the absence of mitigation. Mitigation measures, to be implemented by an Ecological Clerk of Works (required as a condition of consent), would protect all nests (as well as prevent reckless disturbance to Schedule 1A, Schedule A1 and Annex 1 species), so that residual effects would be of low magnitude and not significant.

10.1.4 Observations of flight activity were carried out from two vantage points between April 2012 and March 2013. Three flocks of greylag geese, totalling 91 birds, and three flocks of pink-footed geese, totalling 606 birds, were recorded flying over the collision risk zone (within 253m of the proposed turbine positions) at risk height (20 – 150m). No raptors were detected flying over the Development site.

10.1.5 Collision risk analysis showed that the predicted numbers of collisions by geese from the Consented Development were 0.33 greylag geese and 2.04 pink-footed geese per year, both less than 0.01% of the respective regional populations at that time. Collision risk modelling has been re-run for comparative purposes, using the Proposed Varied Development layout of 11 turbines (rather than 15 of the Consented Development), and using a maximum blade dimension of 66.7m. The revised predicted collision mortality from turbine operation on geese from the Proposed Varied Development is 0.37 per year for greylag geese and 2.26 pink-footed

geese per year, both still substantially less than 0.01% of the respective up-dated Great Britain and flyway populations[1] [2] and therefore still of very low magnitude and not significant.

10.1.6 Post-construction monitoring at Gordonbush Wind Farm has detected golden eagle flight activity to the south of that site and southeast of the Proposed Varied Development. This is a change since the 2015 ES baseline, when golden eagle activity was negligible. Therefore, a detailed assessment has been completed for this Chapter, of the potential impact of the Proposed Varied Development on golden eagles. This is in the form of a Confidential Annex and applies recent research findings on wind farm and eagle interactions in Scotland.

10.1.7 In summary, and including these findings on golden eagles, provided that the proposed mitigation measures (proposed in 10.1.3 and 10.10) are implemented, the effect of the Proposed Varied Development on the bird populations at the site is considered to be low magnitude and not significant. There would be no adverse effect on the bird populations or the integrity of the Caithness and Sutherland Peatlands SPA.

10.2 Introduction

10.2.1 The aim of this Chapter is to report upon the likely significant effects of the Proposed Varied Development upon birds. These include the birds on the open ground, those in the forested areas and those flying over the site. The specific aims of the Chapter are to identify and assess potential construction effects, potential operational effects (including collision risk) and potential decommissioning effects. The Chapter has been written by RPS' Director of Ecology (Scotland), who has over 20 years' experience in ornithological impact assessment and mitigation. Specialist modelling of golden eagle ranging behaviour was undertaken by Natural Research Ltd. the contributing authors of which also have over 20 years' experience, notably on raptor ecology and behaviour.

10.2.2 The 2017 EIA regulations deal with the proposed variations as a "change to or extension of" the Consented Development. This Chapter therefore includes a summary of the effects as a result of the Consented Development, together with responses to the application for the relevant s.36 Consent from key stakeholders, and relevant mitigation measures and Conditions of Consent to enable the differences (if any) between the Consented Development and Proposed Varied Development to be considered.

10.2.3 This Chapter is supported by Appendix 10.1: Collision Risk Calculations. Figures illustrating bird survey results from the 2015 ES are included in Appendix 10.2. Bird species are referred to in the text by their common names; they are listed with their scientific names in Appendix 10.3. Appendix 10.4 is the Confidential Technical Report commissioned for the Proposed Varied Development, on the potential effects of the proposed Gordonbush Extension Wind Farm on golden eagles (Whitfield and Fielding 2018).

10.3 Consented Development

Summary of Effects

10.3.1 The potential negative effects of wind farms on birds are from habitat loss, disturbance and nest destruction during the construction phase and disturbance, displacement and collision risk during the operational phase.

10.3.2 The 2015 ES assessed the magnitude and significance of these potential effects, with particular emphasis on target species of at least Regional conservation status and on raptors and geese recorded flying over the survey area. There were no likely significant effects assessed for these

[1] https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/pink-footed-goose/
[2] https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/iceland-greylag-goose/

species. The assessment also considered potential negative effects on nesting birds, irrespective of their conservation status. Through deployment of an Ecological Clerk of Works, the assessment also concluded there would be no significant effect on nesting birds. The Habitat Regulations Assessment carried out concluded the Extension would have no adverse impact on the integrity of the Caithness and Sutherland Peatlands SPA.

Consultation Responses

10.3.3 No objections to the application for consent for the Consented Development were received.

10.3.4 In response to the 2015 ES, RSPB confirmed that they did not believe the Consented Development would lead to significant adverse impacts on bird life, subject to the proposed mitigation measures put forward in the 2015 ES. Similarly, SNH did not object to the proposal, advising that provided that pre-construction bird surveys and appropriate mitigation during construction are implemented, the Consented Development should not adversely affect bird species.

Relevant Mitigation Measures and Conditions of Consent

10.3.5 The 2015 ES concluded that since all the potential effects of the development on birds, apart from risks to nests, were assessed as being of low or very low magnitude and not significant, no mitigation apart from measures to protect nesting birds during the construction period were required. These were included in the Schedule of Mitigation. The Schedule of Mitigation for the Proposed Varied Development (see Appendix 4.2) incorporates the same measures committed to for the Consented Development.

10.3.6 The following Conditions of Consent are relevant for ornithological interests.

Condition 8: Decommissioning and Restoration Plan.

The Development will be decommissioned and will cease to generate electricity by no later than the date falling twenty-five years from the Final Commissioning Date. The total period for restoration of the Site in accordance with this condition shall not exceed three years from the Final Commissioning Date without prior written approval from the Scottish Ministers in consultation with the Planning Authority.

There shall be no Commencement of Development unless a decommissioning, restoration and aftercare strategy has been submitted to and approved in writing by the Planning Authority in consultation with SNH and SEPA. The strategy shall outline measures for the decommissioning of the Development, restoration and aftercare of the site and will include, without limitation, proposals for the removal of the Development, the treatment of ground surfaces, the management and timing of the works, and environmental management provisions.

No later than 3 years prior to decommissioning of the Development or expiration of this consent (whichever is the earlier) a detailed decommissioning, restoration and aftercare plan, based upon the principles of the approved decommissioning restoration and aftercare strategy, shall be submitted to the Planning Authority for written approval in consultation with SNH and SEPA. The detailed decommissioning, restoration and aftercare plan will provide updated and detailed proposals for the removal of the Development, the treatment of ground surfaces, the management and timings of the works and environment management provisions which shall include:

a) A site waste management plan (dealing with all aspects of waste produced during the decommissioning, restoration and aftercare phases);

b) Details of the formation of the construction compound, welfare facilities, any areas of hardstanding, turning areas, internal access tracks, car parking, material stockpiles, oil storage, lighting columns, and any construction compound boundary fencing;

c) A dust management plan;

d) Details of measurements to be taken to prevent loose or deleterious material being deposited on the local road network including wheel cleaning and lorry sheeting facilities, and measures to clean the site entrances and adjacent local road network;

e) A pollution prevention and control method statement, including arrangements for the storage and management of oil and fuel on the site;

f) Soil storage and management;

g) A surface water and ground water management and treatment plan, including details of the separation of clean and dirty water drains, and location of settlement lagoons for silt laden water;

h) Sewage disposal and treatment;

i) Temporary site illumination;

j) The construction of any temporary access into the site and the creation and maintenance of associated visibility splays;

k) Details of watercrossings;

l) A species protection plan based on surveys for protected species (including birds) carried out no longer than 18 months prior to submission of the plan.

The Development shall be decommissioned, site restored and aftercare thereafter undertaken in accordance with the approved plan, unless otherwise agreed in writing in advance with the Planning Authority in consultation with SNH and SEPA.

Reason: To ensure the decommissioning and removal of the Development in an appropriate and environmentally acceptable manner and the restoration and aftercare of the site, in the interests of safety, amenity and environmental protection.

10.3.7 It is proposed to vary Condition 8 to avoid repetition and remove detailed reference to environmental management provisions which are included in Condition 23: CEMP. The proposed condition is shown below, with proposed modifications highlighted in tracked changes. The resulting Condition 8 is included below and in Appendix 1.2.

The Development will be decommissioned and will cease to generate electricity by no later than the date falling twenty-five years from the Final Commissioning Date herein referred to as the Last Operational Date. The total period for restoration of the Site in accordance with this condition shall not exceed three years from the ~~Final Commissioning~~Last Operational Date without prior written approval from the Scottish Ministers in consultation with the Planning Authority.

~~There shall be no Commencement of Development unless a decommissioning, restoration and aftercare strategy has been submitted to and approved in writing by the Planning Authority in consultation with SNH and SEPA. The strategy shall outline measures for the decommissioning of the Development, restoration and aftercare of the site and will include, without limitation, proposals for the removal of the Development, the treatment of ground surfaces, the management and timing of the works, and environmental management provisions.~~

No later than 3 years prior to decommissioning of the Development or expiration of this consent (whichever is the earlier) a detailed decommissioning, restoration and aftercare plan, based upon the principles of the approved decommissioning restoration and aftercare strategy, shall be submitted to the Planning Authority for written approval in consultation with SNH and SEPA. The detailed decommissioning, restoration and aftercare plan will provide updated and detailed proposals for the removal of the Development, the treatment of ground surfaces, the

management and timings of the works and environment management provisions ~~which shall include:~~

~~a) A site waste management plan (dealing with all aspects of waste produced during the decommissioning, restoration and aftercare phases);~~

~~b) Details of the formation of the construction compound, welfare facilities, any areas of hardstanding, turning areas, internal access tracks, car parking, material stockpiles, oil storage, lighting columns, and any construction compound boundary fencing;~~

~~c) A dust management plan;~~

~~d) Details of measurements to be taken to prevent loose or deleterious material being deposited on the local road network including wheel cleaning and lorry sheeting facilities, and measures to clean the site entrances and adjacent local road network;~~

~~e) A pollution prevention and control method statement, including arrangements for the storage and management of oil and fuel on the site;~~

~~f) Soil storage and management;~~

~~g) A surface water and ground water management and treatment plan, including details of the separation of clean and dirty water drains, and location of settlement lagoons for silt laden water;~~

~~h) Sewage disposal and treatment;~~

~~i) Temporary site illumination;~~

~~j) The construction of any temporary access into the site and the creation and maintenance of associated visibility splays;~~

~~k) Details of watercrossings;~~

~~l) A species protection plan based on surveys for protected species (including birds) carried out no longer than 18 months prior to submission of the plan.~~

The Development shall be decommissioned, site restored and aftercare thereafter undertaken in accordance with the approved plan, unless otherwise agreed in writing in advance with the Planning Authority in consultation with SNH and SEPA.

Reason: To ensure the decommissioning and removal of the Development in an appropriate and environmentally acceptable manner and the restoration and aftercare of the site, in the interests of safety, amenity and environmental protection.

Condition 23: Construction and Environmental Management Plan

There shall be no Commencement of Development unless a Construction Environmental Management Plan ("CEMP") outlining the specific details of all on-site construction works, post-construction reinstatement, drainage and mitigation, together with details of the timetabling, has been submitted to and approved in writing by the Planning Authority in consultation with SNH and SEPA.

The CEMP shall include (but shall not be limited to):

a) A site waste management plan (dealing with all aspects of waste produced during the construction period (other than peat), including details of contingency planning in the event of accidental release of materials which could cause harm to the environment;

b) Details of the formation of the construction compound, welfare facilities, any areas of hardstanding, turning areas, internal access tracks, car parking, materials stockpiles, oil storage, lighting columns, and any construction compound boundary fencing;

c) A dust management plan;

d) Site specific details for management and operation of any concrete batching plant (including disposal of pH rich waste water and substances);

e) Details of measures to be taken to prevent loose or deleterious materials being deposited on the local road network including wheel cleaning and lorry sheeting facilities, and measures to clean the site entrances and the adjacent location road network;

f) A pollution prevention and control method statement, including arrangements for the storage and management of oil and fuel on the site;

g) Soil storage and management;

h) A peat management plan, to include details of vegetated turf stripping and storage, peat excavation (including volumes), handling, storage and re-use;

i) A drainage management strategy, demonstrating how all surface and waste water arising during and after development will be managed and prevented from polluting any watercourses or sources;

j) A surface water and groundwater management and treatment plan, including details of the separation of clean and dirty water drains, and locations of settlement lagoons for silt laden water;

k) Sewage treatment and disposal;

l) Temporary site illumination;

m) The construction of the access into the site and the creation and maintenance of associated visibility splays;

n) The methods of construction of crane pads;

o) The methods of construction of turbine foundations;

p) The methods of working cable trenches;

q) The methods of construction and erection of the wind turbines and meteorological masts;

r) Details of watercourse crossings;

Post construction restoration / reinstatement of the working areas not required during the operation of the Development, including construction access tracks, borrow pits construction compound, storage areas, laydown areas, access tracks, passing places and other construction areas. The development shall be implemented thereafter in accordance with the approved CEMP unless otherwise approved in advance in writing by the Planning Authority in consultation with SNH and SEPA.

Reason: To ensure that all construction operations are carried out in a manner that minimises their impact on road safety, amenity and the environment, and that the mitigation measures contained in the Environmental Statement accompanying the application, or as otherwise agreed, are fully implemented.

10.3.8 Minor variations to Condition 23 are proposed to clarify wording in relation to specific requirements of the CEMP. The proposed condition is shown below, with proposed variations highlighted in tracked changes. The resulting Condition 23 is included in Appendix 1.2.

There shall be no Commencement of Development unless a Construction Environmental Management Plan ("CEMP") outlining the specific details of all on-site construction works, post-construction reinstatement, drainage and mitigation, together with details of the timetabling, has been submitted to and approved in writing by the Planning Authority in consultation with SNH and SEPA.

The CEMP shall include (but shall not be limited to):

a) *A site waste management plan (dealing with all aspects of waste produced during the construction period (other than peat)~~, including details of contingency planning in the event of accidental release of materials which could cause harm to the environment~~;*

b) *Details of the formation of the construction compound, welfare facilities, any areas of hardstanding, turning areas, internal access tracks, car parking, materials stockpiles, oil storage, lighting columns, and any construction compound boundary fencing;*

c) *A dust management plan;*

d) *Site specific details for management and operation of any concrete batching plant (including disposal of pH rich waste water and substances);*

e) *Details of measures to be taken to prevent loose or deleterious materials being deposited on the local road network including wheel cleaning and lorry sheeting facilities, and measures to clean the site entrances and the adjacent location road network;*

f) *A pollution prevention and control method statement, including arrangements for the storage and management of oil and fuel on the site;*

g) *Soil storage and management;*

h) *A peat management plan, to include details of vegetated turf stripping and storage, peat excavation (including volumes), handling, storage and re-use;*

i) *A drainage management strategy, demonstrating how all surface and waste water arising during and after development will be managed and prevented from polluting any watercourses or sources;*

j) *A surface water and groundwater management and treatment plan, including details of the separation of clean and dirty water drains, and locations of settlement lagoons for silt laden water;*

k) *Sewage treatment and disposal;*

l) *Temporary site illumination;*

m) *The construction of the access into the site and the creation and maintenance of associated visibility splays;*

n) *The methods of construction of crane pads;*

o) *The methods of construction of turbine foundations;*

p) *The methods of working cable trenches;*

q) *The methods of construction and erection of the wind turbines and meteorological masts;*

r) *Details of watercourse crossings;*

s) *Post construction restoration / reinstatement of the working areas not required during the operation of the Development, including~~ construction access tracks~~, borrow pits construction compound, storage areas~~,~~ and laydown areas~~, access tracks, passing places and other construction areas.~~;*

t) *Environmental Incident and Emergency Plan including details of contingency planning in the event of accidental release of materials which could cause harm to the environment.*

~~s)~~u) *Details of species and habitat protection measures to be implemented for the construction period and details of appropriate relevant reporting and monitoring programmes.*

The development shall be implemented thereafter in accordance with the approved CEMP unless otherwise approved in advance in writing by the Planning Authority in consultation with SNH and SEPA.

Reason: To ensure that all construction operations are carried out in a manner that minimises their impact on road safety, amenity and the environment, and that the mitigation measures contained in the Environmental Statement accompanying the application, or as otherwise agreed, are fully implemented.

Condition 24: Ecological Clerk of Works

There shall be no Commencement of Development unless the Planning Authority has approved in writing the terms of appointment by the Company of an independent Ecological Clerk of Works (ECoW) in consultation with SNH and SEPA. The terms of appointment shall;

a) Impose a duty to monitor compliance with the ecological and hydrological commitments provided in the environmental statement and other information lodged in the environmental statement and other information lodged in support of the application, eth Construction and Environmental Management Plan, the Habitat Management Plan approved in accordance with condition 25, and other plans approved in terms of condition 23;

b) Require the ECoW to report to the Company's construction project manager any incidences of non-compliance with the ECoW works at the earliest practical opportunity;

c) Require the ECoW to submit a monthly report to the Planning Authority summarising works undertaken on site; and

d) Require the ECoW to report to the Planning Authority any incidences of non-compliance with the ECoW Works at the earliest practical opportunity.

The ECoW shall be appointed on the approved terms throughout the periods from Commencement of Development, through any period of construction activity and during any period of post construction restoration works approved in terms of condition 8.

No later than 18 months prior to decommissioning of the Development or the expiration of this consent (whichever is the earlier), the Company shall submit details of the germs of appointment by the Company of an independent ECoW throughout the decommissioning, restoration and aftercare phases of the Development to the Planning Authority for approval in consultation with SNH and SEPA. The ECoW shall be appointed on the approved terms throughout the decommissioning, restoration and aftercare phases of the Development.

Reason: To secure effective monitoring of and compliance with the environmental mitigation and management measures associated with the Development.

10.3.9 Minor variations to the wording of this Condition are proposed. The proposed variations are reflected below and in Appendix 1.2.

There shall be no Commencement of Development unless the Planning Authority has approved in writing the terms of appointment by the Company of an independent Ecological Clerk of Works (ECoW) in consultation with SNH and SEPA. The terms of appointment shall;

a) Impose a duty to monitor compliance with the ecological and hydrological commitments provided in the ~~environmental statement~~EIA Report and other information lodged in support of the application, eth Construction and Environmental Management Plan, the Habitat Management Plan approved in accordance with condition 25, and other plans approved in terms of condition 23;

b) Require the ECoW to report to the Company's construction project manager any incidences of non-compliance ~~with the ECoW works~~ at the earliest practical opportunity;

c) Require the ECoW to submit a monthly report to the Planning Authority summarising works undertaken on site; and

d) Require the ECoW to report to the Planning Authority any incidences of non-compliance ~~with the ECoW Works~~ at the earliest practical opportunity.

The ECoW shall be appointed on the approved terms throughout the periods from Commencement of Development, through any period of construction activity and during any period of post construction restoration works approved in terms of condition 8.

No later than 18 months prior to decommissioning of the Development or the expiration of this consent (whichever is the earlier), the Company shall submit details of the germs of appointment by the Company of an independent ECoW throughout the decommissioning, restoration and aftercare phases of the Development to the Planning Authority for approval in consultation with SNH and SEPA. The ECoW shall be appointed on the approved terms throughout the decommissioning, restoration and aftercare phases of the Development.

Reason: To secure effective monitoring of and compliance with the environmental mitigation and management measures associated with the Development.

Condition 25: Habitat Management Plan

There shall be no Commencement of Development unless a habitat management plan has been submitted to and approved in writing by the Planning Authority in consultation with SNH and SEPA. The habitat management plan shall set out proposed habitat management of the wind farm site during the period of construction, operation, decommissioning, restoration and aftercare of the site, and shall provide for the maintenance, monitoring and reporting of any deer, breeding birds, otter, pine marten and water vole habitat on site.

The approved habitat management plan will include provision for regular monitoring and review to be undertaken to consider whether amendments are needed to better meet the habitat plan objectives. In particular, the approved habitat management plan will be updated to reflect ground condition surveys undertaken following construction and prior to the date of Final Commissioning and submitted to the Planning Authority for written approval in consultation with SNH and SEPA.

Unless otherwise agreed in advance in writing with the Planning Authority, the approved habitat management plan shall be implemented in full.

Reason: In the interests of good land management and the protection of habitats.

10.3.10 It is proposed to vary Condition 25 to increase clarity of the HMP's objectives and to help ensure it focusses on mitigating the significant predicted effects. The proposed Condition is shown below, with proposed modifications highlighted in tracked changes. The resulting Condition 25 is also included in Appendix 1.2.

~~There shall be no Commencement of Development unless a habitat management plan has been submitted~~Prior to Commissioning of the Development the draft habitat management plan shall be amended, as necessary, and submitted to and approved in writing by the Planning Authority in consultation with SNH~~. and SEPA~~. The habitat management plan shall set out proposed habitat management measures ~~of the wind farm site~~ during the operational period of the site to mitigate significant environmental impacts identified in the EIA Report. ~~of construction, operation, decommissioning, restoration and aftercare of the site, and shall provide for the maintenance, monitoring and reporting of any deer, breeding birds, otter, pine marten and water vole habitat on site.~~

The Applicant should investigate the opportunity to align and consolidate the Gordonbush Estate HMP and any proposed HMP for the Proposed Varied Development. ~~The approved habitat management plan will include provision for regular monitoring and review to be undertaken to consider whether amendments are needed to better meet the habitat plan objectives. In particular, the approved habitat management plan will be updated to reflect ground condition~~

~~*surveys undertaken following construction and prior to the date of Final Commissioning and submitted to the Planning Authority for written approval in consultation with SNH and SEPA.*~~

Unless otherwise agreed in advance in writing with the Planning Authority, the approved habitat management plan shall be implemented in full.

Reason: In the interests of good land management and the protection of habitats.

10.4 Scope of Assessment

Study Area

10.4.1 The original bird survey area, used for surveys from April 2012 to March 2013, was based on the site boundary at that time. The survey area for resident birds and those flying over the site was defined by a 500m buffer around the site boundary, while the survey area for breeding raptors extended 2km from the site boundary. In spring 2013, following a northward extension of the site boundary to include a borrow pit and to make use of existing tracks, the survey areas were adjusted accordingly (see Appendix 12.2: Bird Survey Figures from the 2015 ES (Figure 10.1)), included as supporting information with that application for the relevant s36 consent). The area immediately to the north of the site was covered by the concurrent post-construction surveys carried out on Gordonbush Wind Farm and that data was incorporated into the 2015 ES.

10.4.2 The assessment area for potential effects of the Proposed Varied Development on breeding birds was defined by a 500m buffer around the proposed turbine positions (the turbine assessment area, which includes the proposed new tracks) and a 200m buffer around the existing access tracks at the north edge of the Proposed Varied Development site.

Consultation

10.4.3 For the Proposed Varied Development, consultation has occurred through the pre-application engagement with key stakeholders including The Highland Council and SNH. The points raised in relation to birds are provided in Table 10.1 of this Chapter, with comments or actions in response.

Table 10.1: Consultation Summary Relevant to Birds

Consultee	Summary Response	Comment/Action Taken
SNH	Whilst noting that the Proposed Varied Development abuts the Caithness and Sutherland Peatlands SPA and Ramsar site, SNH does not consider that additional bird survey work will be required to inform the impacts of this proposal, despite it being five years old.	Noted and no action required.
SNH	The original bird vantage point survey work covered the whole of the new swept area; therefore collision risk can be recalculated using the new turbine dimensions.	The collision risk modelling has been re-run as suggested, using the new turbine dimensions.
SNH	The original survey work only recorded a single flight of an SPA qualifying species (i.e. golden plover). We therefore do not think it is reasonable to request additional bird survey work in this specific instance. However, the recalculated impacts of this development should be assessed as part of a Habitats Regulation Appraisal within the EIA Report.	In light of the conclusions of this chapter that there are no likely significant effects on the integrity or conservation objectives of the SPA a Habitats Regulations Appraisal is unnecessary.

10.4.4 Since operation of the Gordonbush Wind Farm, post-construction monitoring of the operational site has recorded golden eagle flight activity, initially during standard vantage point watches and subsequently through targeted golden eagle surveys (Northern Ecological Services 2016, 2017, 2018a and 2018b). The data showing golden eagle activity to the south and east of the Proposed

Varied Development has therefore also been used to scope the assessment in terms of species covered.

10.4.5 These data are now presented to SNH for consideration and supplements the information provided at the pre-application stage.

10.5 Policy, Legislation and Guidance

10.5.1 A number of legislative, policy and guidance documents have been updated since the 2015 ES and 2016 FEI Report were submitted. A summary of all new or updated documents is provided in Table 10.2 below. Documents not included within Table 10.2 remain as per the 2015 ES and 2016 FEI Report and are not included.

Table 10.2 Key Protective Legislation to Birds Which Has Altered Since the Original Assessment

Document	Brief description
Legislation	
The Habitats and Species Regulations 2017	Changes that have been made serve to update references to related legislation and improve the overall text of the Regulations. Such changes include the removal of references to 'regional strategies' and 'unitary development plans' and the insertion of the River Tweed Commission as a relevant authority. This revised legislation is relevant to Scotland only in reserved matters.
The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017	The EIA Report has been prepared in accordance with The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
Policy	
Highland Council Local Biodiversity Action Plan (2015-2020)	The new Plan identifies 33 priorities for future work. For each, a number of projects have been identified, with a lead partner taking on the responsibility to work with other Highland Environment Forum members to deliver action over the next five years.
Guidance	
Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2018)	This document updates the previous iterations of the guidance detailing the methods for implementing Ecological Impact Assessment and a focus on the hierarchy of avoidance, mitigation and compensation. The table-based approach of assessment has been removed from the original (2006) version of the guidance used in the previous assessment with the emphasis switched to professional judgement.
SNH General Pre-Application and Scoping Advice to Developers of Onshore Wind Farms (SNH, 2018)	This document provides a checklist of the submission requirements for onshore wind farm applications. This now includes an assessment of the use of the ground by native deer populations and the potential impact of their dispersal.
SNH (Version 2, March 2017) 2017) Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms (SNH 2017)	This document mainly provides an up-date of information sources to refer to for background data or guidance on specific aspects of bird assessment. There are also minor changes to vantage point survey considerations.

10.6 Methodology

Desk Study

10.6.1 No desk study up-date was requested during the pre-application consultation with key stakeholders. The desk study completed for the 2015 ES and 2016 FEI Report, coupled with the field work completed to support the previous submission, therefore remain the basis for this revised assessment.

Field Survey

10.6.2 SNH stated in its 2018 pre-application consultation response that no further field work was required for bird species, given that the extent of the surveys previously carried out encompass the Proposed Varied Development. The fieldwork results reported in the 2015 ES have therefore been used for this assessment. The survey methods met the (2010) SNH guidance on bird surveys for wind farms; and would meet the 2017 SNH guidance also.

10.6.3 Field surveys to inform the 2015 ES and 2016 FEI Report comprised breeding bird surveys (using Brown and Shepherd (1993) survey method), breeding raptor surveys (using relevant methods in Gilbert *et al*. 1998 and Hardey *et al*. 2006), and vantage point observations (following SNH guidelines (SNH 2010a but which would be compliant with SNH 2017) from two points, for a minimum of 36 hours at each point in each season (spring and winter, with survey periods covering dawn and dusk, when particular attention was paid to golden plovers flying over the survey area).

10.6.4 Field survey data was also collected during post-construction monitoring at Gordonbush Wind Farm. The recording of golden eagle flight activity resulted in specific analysis of this species' occurrence to the south and east of the Proposed Varied Development. As noted above, details of this flight activity are provided in Appendix 10.4 (Confidential).

Assessment of Effects

10.6.5 The method of assessment for this Chapter follows that of CIEEM (2018) guidance and is similar in nature to that used in the 2015 ES and 2016 FEI Report which followed IEEM (2006). A greater emphasis is however, placed on professional judgement of the reporting ornithologist rather than a table-based assessment. The term Valued Ecological Receptor (VER) has been replaced with that of Important Ecological Feature (IEF) for those species and habitats identified to be included in the assessment. For each impact with the potential to affect the relevant IEFs, the assessment considers the following parameters:

- Whether the impact is positive or negative in its influence;
- The extent of the impact;
- The magnitude, duration and timing of the impact; and
- The impact's frequency and ease of reversibility.

10.6.6 The assessment similarly includes consideration of any proposed mitigation to avoid or minimise the effect of any potential impact to the relevant IEFs and identifies any potential cumulative impacts from surrounding developments prior to determining the residual significance of any effect, be this negligible, minor, moderate or major.

Sensitivity/Importance

10.6.7 The approach to the assessment of the sensitivity and importance of a bird species is first to consider the species' conservation status and the importance of the population present on the site. These are then used to assess the conservation value of the species on the site.

10.6.8 The conservation status of a bird species is based primarily on its UK status, modified by its regional status. The scheme uses a two-dimensional matrix, using UK status and regional status as the two dimensions, to give a species' resultant conservation status in a particular area.

10.6.9 The *National conservation status* of birds in the UK can be divided into five categories; (birds in a sixth category, International Union for Conservation of Nature (IUCN) globally- threatened species, are unlikely to occur on any proposed UK development site, but if they did would be considered to be of International status irrespective of their regional status). The other five categories are:

- Species given special protection under EU legislation; listed on Annex 1 of the EU Birds Directive;
- Species given special protection under UK legislation; listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Species of serious conservation concern; Red List species and UK Biodiversity Action Plan (UKBAP) Priority species;
- Species of some conservation concern; Amber List species; and
- Species for which there is little or no conservation concern; Green List species and any species common and widespread throughout the UK.

10.6.10 The *regional conservation status* of birds can be divided into three categories:

- Rare in the region and/or Local Biodiversity Action Plan (LBAP) Priority Species; species for which a Species Action Plan recommends safeguarding of all sites and species with a need to protect all populations above a certain size;
- Uncommon or patchily distributed in the region; and
- Common and/or widespread in the region.

10.6.11 The *resultant conservation status* of a bird species on the Development site will depend on the interaction between its UK conservation status and its conservation status in northern Scotland. Table 10.3 sets out the resultant conservation status of bird species. Note that the categories shown may be modified according to the national or regional circumstances of a particular species. In Table 10.3, "National" refers to the whole UK; "Regional" refers to northern Scotland: and "Local" refers to the site and immediate environs. The five categories in Table 10.3 are considered to be the most appropriate for bird species, since population data can be obtained for the four geographical areas concerned.

Table 10.3: The Resultant Conservation Status of Bird Species

National Conservation Status	Regional Conservation Status		
	Rare	Uncommon	Common
Annex 1	International	National	Regional
Schedule 1	National	National	Regional
Red List/UKBAP	National	National/Regional	Regional/Local
Amber List	Regional	Regional	Local
Green List	Regional	Local	Local

10.6.12 The *conservation value* of a bird species depends on a combination of two factors; its conservation status (above) and the importance of its population on the site. The criteria for determining the conservation value of bird species in the survey area is set out in Table 10.4. Conservation value is increased if a species is listed as a qualifying species for a potentially affected SPA or is listed as a notified feature of a potentially affected SSSI.

10.6.13 The site population of a resident or regularly occurring bird species is judged to be important at a particular level (National, Regional or Local) if it exceeds 1 % of that level's total population. The latter is a generally used value e.g. to decide if a species should be included as a qualifying species of a designated site. The interaction of the conservation status of a species and the importance of its site population then determines its conservation value on the site. For example; a large colony containing 10 % of the UK population of a species would be of National value, even if the species itself was not of conservation concern in the UK. Conversely, a "population" represented on site by only a few records, with no reliable evidence that the birds were resident, would be of relatively low conservation value, even if the species itself was of National conservation status.

10.6.14 A site population is regarded as Low if it forms less than 1% of the local population. In distinguishing between local and low, it is assumed that the area outside the site but within 5 –

10km will be at least 100 times the area of the site. Consequently, if the habitat on the site is similar to that in the immediately surrounding area, a species population on the site will not exceed 1% of the population within 5 – 10km, unless the site population is at an unusually high density relative to that in the surrounding area.

Table 10.4: Criteria for Determining the Conservation Value of Bird Species in the Survey Area

	Conservation status				
	International	National	Regional	Local	Low
Site population					
International	International	International	International	International	International
National	International	National	National	National	National
Regional	International	National	Regional	Regional	Regional
Local	International	National	Regional	Local	Local
Low	National	Regional	Local	Low	Low

Magnitude of Effect

10.6.15 The criteria used for assessing the magnitude of effects on birds were as follows:

- Low – no reduction in numbers or change in species richness likely, but population made more vulnerable to further impacts; short term (5 years) temporary reduction in numbers or species richness, or change in species assemblage likely;
- Medium – medium term (up to 15 years), but temporary reduction in numbers or species, or change in species assemblage likely; small permanent reduction in numbers or species-richness, or change in species assemblage likely; and
- High – large permanent reduction in numbers or species-richness or change in species assemblage likely.

Significance of Effect

10.6.16 The significance of each effect upon each valued ecological feature is assessed. An ecologically significant effect is defined as an impact on the integrity of a defined site or ecosystem and/ or the conservation status of habitats or species (CIEEM, 2018). The effect is assessed within a specific geographic context i.e. at the scale at which the ecological feature was valued (e.g. local/ national/ international). The significance of effects is described as negligible, minor, moderate or major. Effects are considered to be significant under the 2017 EIA Regulations where the effect is classified as being of 'major' or 'moderate' significance, where:

- Major: effects which are likely to be important considerations at a regional or district scale but which, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process;
- Moderate: effects which, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource;
- Minor: effects which may be raised as local issues but which are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project; and
- Negligible: no effect or no significant effect, irrespective of other effects.

10.6.17 The final assessment of whether a significant effect is likely completed by taking the mitigation measures into account, including both the mitigation incorporated into the design of the development and mitigation required to address residual impacts. This requires an assessment on the likelihood of successful mitigation being achieved and the mitigation proposed needs to

be qualified in terms of the probability of success. The assessment of success of mitigation can be based on both professional judgement and experience of other mitigation schemes. In general, a precautionary approach is advisable in determining the outcome. In relation to determining likely significant effects on European protected sites a precautionary approach is always adopted.

Limitations to the Assessment

10.6.18 No significant limitations to the assessment have been identified.

10.7 Baseline Conditions

Designations

10.7.1 The Proposed Varied Development lies immediately to the south-east of the Caithness and Sutherland Peatlands SPA. The SPA qualifies under Article 4.1 of the EU Birds Directive (2009/147/EC) by supporting populations of European importance of the following species listed on Annex I of the Directive: black-throated diver; golden eagle; golden plover; hen harrier; merlin; red-throated diver; short-eared owl; and wood sandpiper.

10.7.2 The SPA also qualifies under Article 4.2 of the EU Birds Directive (2009/147/EC) by supporting populations of European importance of the following migratory species: common scoter; dunlin; greenshank; and wigeon. One of the component parts of the SPA lies adjacent to the Proposed Varied Development; this component is underpinned by the Coir' an Eoin SSSI, which has golden plover as a notified feature.

Desk Study

10.7.3 The Ornithology chapter of the 2015 ES provided desk study information, notably in relation to the appropriate assessment completed for the Gordonbush Wind Farm, which had concluded no Likely Significant Effect for all species, with the exception of golden plover and merlin. The subsequent appropriate assessment for these two species was able to conclude that there was no adverse impact on the SPA's integrity from the wind farm.

10.7.4 The Highland Raptor Study Group was consulted originally as part of the 2015 ES for records of the key species groups protected by both UK or European legislation that are recorded in the locality of the development.

Field Studies

Surveys and Summary Results for Target Species

10.7.5 In accordance with the pre-application consultation response from SNH (see Appendix 6.1: Pre-Application Advice Pack), no updated bird surveys were required for this assessment (see Table 10.1). The following sections therefore re-state the key survey details and results from the 2015 ES as these form the baseline used for this ornithological impact assessment and EIA Report.

10.7.6 Vantage point observations at the existing Gordonbush Wind Farm were carried out each spring from 2009 to 2013 and each winter from 2010/11 to 2012/13. In each period, observations were carried out for 36 hours at each of two vantage points, which covered the area within 500m of the turbine positions.

10.7.7 Breeding bird surveys of the Gordonbush Wind Farm site and surveys for breeding raptors within 2km of the Gordonbush Wind Farm were carried out each spring from 2009 to 2013.

10.7.8 Breeding bird surveys and vantage point observations were carried out on HMP areas at Gordonbush Estate in spring 2009 and 2010, including two 1 x 1km squares close to the Development site and also on a clear felled area at Bullburn, immediately to the west of the Development site boundary, each spring from 2010 to 2013.

10.7.9 Results presented in the 2015 ES focused on species listed in Annex 1 of the EU Birds Directive, on Schedule 1 of the Wildlife and Countryside Act (as amended), migratory waterfowl, qualifying species of the adjacent SPA, and species of conservation concern (e.g. Red List and UKBAP species). The target species considered below exclude species described in the Gordonbush Wind Farm ES as unlikely to occur at the site and which were not recorded during the 2009-2013 field surveys, namely: black- throated diver, common scoter, red-throated diver, short-eared owl, wigeon and wood sandpiper.

Breeding Raptors

10.7.10 No breeding raptors were detected within 2km of the wind farm in targeted surveys carried out in spring each year from 2009 to 2013. A historical golden eagle nest site was noted approximately 6km from the site, but it had not been occupied in recent years. Two historical merlin nest sites were also near the north end of the Development, but no breeding had been detected at either of these in the five years from 2009 to 2013. Some suspected breeding activity was observed in spring 2010 in an area approximately 1km to the east of the north end of the Development site, but nesting was not confirmed.

Flights by Raptors

10.7.11 Small numbers of raptor flights were recorded in spring and summer in the Gordonbush Wind Farm survey area (Table 10.5), with only one flight seen in both 2012 and 2013. In winter, one flight by a merlin was recorded in 2010/11, but no flights by raptors were seen within the survey area in the two subsequent winters, 2011/12 and 2012/13.

Table 10.5: Flights by Raptors in the Gordonbush Wind Farm Survey Area in Spring and Summer.

Species	2009	2010	2011	2012	2013
Golden eagle	1	0	0	0	0
Hen harrier	0	3	2	1	1
Merlin	1	1	1	0	0
Osprey	0	1	0	0	0
Peregrine	0	1	0	0	0
Total	2	6	3	1	1

Flights by Wildfowl

10.7.12 Ten flocks of geese were recorded in the goose wintering season (September to April) in 2010/11 (Table 10.6) and three flocks each season in the two subsequent winters. All 701 of the pink-footed geese and 364 of the greylag geese were flying at heights over 150m and so were not considered at risk of collision.

Table 10.6: Flights by Wildfowl in the Gordonbush Wind Farm Survey Area.

Species	2010/11		2011/12		2012/13	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Greylag goose	9	325	3	180	3	70
Pink-footed goose	1	700	0	0	0	0
Total	10	1,025	3	180	3	70

10.7.13 A flock of 26 whooper swans was recorded flying over the wind farm at an estimated height of 500m in November 2010, but no others were seen there in any of the surveys between 2009 and 2013.

Other Species of Conservation Concern

Golden plover

10.7.14 The wind farm survey area held 15 pairs in spring 2009, 13 pairs in 2010, nine pairs in 2011, four pairs in 2012 and one pair in 2013.

Greenshank

10.7.15 Two pairs of greenshanks were recorded in the wind farm survey area in spring 2010, one pair in 2011, one pair in 2012 but none in 2013. One pair nested in the Bullburn clear-felled area to the west of the Development site in spring in 2011, 2012 and 2013. This pair was located over 1km from the nearest point of the Development site boundary.

Lapwing

10.7.16 Lapwings were recorded in the clear-felled area of Bullburn, just to the west of the Development; two pairs in spring 2011, three pairs in 2012 and two pairs in 2013. The nearest of these pairs was 0.8km from the west edge of the Development site boundary.

Red grouse

10.7.17 Red grouse were widespread in the general locality, with up to 15 pairs recorded in the wind farm survey area in 2009 - 2013. One pair was found in Bullburn in 2013.

Skylark

10.7.18 Skylarks were very common in the general locality, with up to 139 pairs recorded in the wind farm survey area in 2009 – 2013.

Breeding Bird Survey Results

10.7.19 The 2015 ES breeding bird survey recorded 78 pairs of 16 resident bird species (excluding meadow pipits) in the breeding bird survey area in spring 2012 and 53 pairs of 10 species in spring 2013 (Table 10.7). By far the commonest species in both years was the skylark, with the other species occurring in small numbers. As noted in the target species summaries above, no resident raptors or golden plovers were recorded within the site in either year.

Table 10.7: The Conservation Designations and Conservation Status of the Resident Bird Species Recorded in the Breeding Bird Survey Area in Spring 2012 and Spring 2013 and the Number of Pairs of Each Species (Up-dated for Birds of Conservation Concern 4).

Species	Designation*	Conservation status	2012	2013
Chaffinch		Low	4	4
Coal tit		Low	1	0
Common sandpiper		Local	1	1
Curlew	Red List; UKBAP	Regional/Local	3	0
Dipper		Low	1	1
Dunnock		Low	1	0
Grey wagtail		Low	1	1
Pied wagtail		Low	5	1
Red grouse	UKBAP	Regional/Local	1	1
Robin		Low	1	0
Skylark	Red List; UKBAP	Regional	45	36
Snipe		Low	1	1
Stonechat		Local	1	3

Species	Designation*	Conservation status	2012	2013
Wheatear		Low	5	4
Whinchat		Local	1	0
Willow warbler		Low	6	0
Total species			**16**	**10**
Total pairs			**78**	**53**

*Note: Where no designation is shown, the species is not of conservation concern.

10.7.20 The locations of bird species of conservation concern are shown in Figure 10.2 of the 2015 ES (see Appendix 10.2). In both years, skylarks were found throughout the central ridge of the survey area but were absent from the stream valleys at the east and west edges of the area. Red grouse were found on the high ground near the centre of the area, while curlews were found mainly in the valley at the west edge of the survey area, but they were present only in 2012 (Figure 10.2 of the 2015 ES, included in Appendix 10.2).

10.7.21 In 2012, 79 pairs of meadow pipits were detected in 15km of transect (5.27 per km) while in 2013 67 pairs were detected in 18km of transect (3.72 per km). The estimated density, calculated by Distance software (Thomas *et al*. 2004) was 0.92 pairs per ha in 2012 and 0.66 pairs per ha in 2013.

Vantage Point Flight Detail for Target Species

10.7.22 Only target species for which flights were identified during surveys in 2012 and 2013 (in alphabetic order) are shown in Tables 10.8 to 10.12. The data tabulated are; observation record (with which flight lines are labelled in the Figures); date; starting time of the observation; vantage point; number of birds; duration of the flight and number of records (at 15sec intervals) in each height band. Flights which passed through the collision risk zone (within 266.7m of the proposed turbine positions) at risk height (20 – 150m) are highlighted in bold.

Golden plover

10.7.23 Golden plovers were recorded during vantage point observations only on 13th April 2012, when one bird flew into the survey area from the west and was joined by three others flying across the area from the east, before all four flew off to the north-west (Table 10.8; Figure 10.3 of the 2015 ES, included in Appendix 10.2). The birds flew at collision risk height through the collision risk zone.

Table 10.8: Flight by golden plovers within the survey area in 2012/13

Record	Date	Time	VP	Number	Duration	Records in height band		
					(Sec)	<20m	20-150m	>150m
GP1	**13/04/2012**	**08:11**	**1**	**4**	**180**	**0**	**13**	**0**

Greylag goose

10.7.24 In spring 2012, four flocks of greylag geese totalling 114 birds were recorded flying northwards over the survey area on 12th and 13th April (Table 10.9; Figure 10.4 of the 2015 ES, included in Appendix 10.2). All of the flocks were flying at a height of 20 - 150m; three of them (GJ2, GJ3 and GJ4) were within the collision risk zone and one (GJ1) was outside the zone. In autumn and winter 2012/13, two flocks, totalling 93 birds, were recorded flying northwards up the valley at the west edge of the survey area (Figure 10.4 of the 2015 ES, included in Appendix 10.2). Both flocks were flying at heights above 150m and neither flock flew within the risk zone.

Table 10.9: Flights by greylag geese within the survey area in 2012/13

Record	Date	Time	VP	Number	Duration	Records in height band		
					(Sec)	<20m	20-150m	>150m
GJ1	12/04/2012	07:07	2	23	48	0	4	0
GJ2	**13/04/2012**	**06:25**	**1**	**19**	**169**	**0**	**12**	**0**
GJ3	**13/04/2012**	**07:12**	**1**	**17**	**342**	**0**	**21**	**0**
GJ4	**13/04/2012**	**07:40**	**1**	**55**	**190**	**0**	**13**	**0**
GJ5	28/11/2012	11:20	2	39	180	0	0	13
GJ6	12/01/2013	10:13	1	54	90	0	0	7

Merlin

10.7.25 Two short merlin flights were recorded, both on 25th August 2012 (Table 10.10; Figure 10.3 of the 2015 ES, included in Appendix 10.2). Both birds appeared to be juvenile males (probably the same bird) and were flying low over the ground, below 20m, at the west edge of the survey area and outside the Development site boundary.

Table 10.10: Flights by merlins within the survey area in 2012/13

Record	Date	Time	VP	Number	Duration	Records in height band		
					(Sec)	<20m	20-150m	>150m
ML1	25/08/2012	16:54	1	1	46	4	0	0
ML2	25/08/2012	17:33	1	1	24	2	0	0

Pink-footed goose

10.7.26 In spring 2012, three flocks of pink-footed geese, totalling 606 birds, were seen flying northwards and north-westwards over the survey area, at a height of 20 - 150m, on 16th and 18th April (Table 10.11; Figure 10.4 of the 2015 ES, included in Appendix 10.2). All three flights were within the risk zone. On 31st October 2012, three flocks, totalling 68 birds, flew westwards across the south part of the survey area, before turning southwards (Figure 10.4 of the 2015 ES, included in Appendix 10.2). All three flocks were flying at heights over 150m and none passed within the Development site boundary. Flock PG5 passed just outside the survey area boundary.

Table 10.11: Flights by pink-footed geese within the survey area in 2012/13

Record	Date	Time	VP	Number	Duration	Records in height band		
					(Sec)	<20m	20-150m	>150m
PG1	**16/04/2012**	**14:11**	**1**	**61**	**124**	**0**	**9**	**0**
PG2	**16/04/2012**	**16:45**	**1**	**195**	**76**	**0**	**6**	**0**
PG3	**18/04/2012**	**15:05**	**1**	**350**	**110**	**0**	**9**	**0**
PG4	31/10/2012	09:35	1	52	120	0	0	9
PG5	31/10/2012	09:35	1	5	150	0	0	11
PG6	31/10/2012	09:35	1	11	150	0	0	11

Whooper swan

10.7.27 One flock of 21 whooper swans was recorded flying south-eastwards across the survey area on 31st October 2012 (Table 10.12; Figure 10.4 of the 2015 ES, included in Appendix 10.2). The swans started and ended their passage over the survey area at heights over 150m, but over the higher ground in the centre of the site they flew at heights between 20m and 150m. The flock passed just outside the collision risk zone.

Table 10.12: Flight by whooper swans within the survey area in 2012/13

Record	Date	Time	VP	Number	Duration	Records in height band		
					(Sec)	<20m	20-150m	>150m
WS1	31/10/2012	10:52	1	21	120	0	4	5

Vantage Point Observations: Secondary Species

10.7.28 The secondary species most commonly recorded from the vantage points were buzzards and ravens (Table 10.13), with other species seen in very small numbers. Buzzards and ravens were much commoner in winter than in spring.

Table 10.13: The Numbers of Secondary Species Recorded During Vantage Point Observations in Spring 2012 and Winter 2012/13

Species	Spring 2012	Winter 2012/13
Buzzard	15	34
Herring gull	1	0
Great black-backed gull	2	0
Kestrel	1	3
Lesser black-backed gull	4	0
Raven	12	41

Breeding Raptors

10.7.29 No raptors were found to be nesting in the survey area or within 2km of the site boundary in either 2012 or 2013.

Modifying Influences

10.7.30 Consideration was given in the 2015 ES to future processes (other than the Development) which are likely to change baseline conditions with regard to birds. Measures being carried out under the existing Gordonbush HMP within the area of the Proposed Varied Development are considered unlikely to significantly affect bird populations on the Proposed Varied Development site, since the sward there is already heterogeneous (see Chapter 8: Ecology).

10.7.31 Since the operation of the Gordonbush Wind Farm, post-construction monitoring has recorded golden eagle flight activity (as noted in 10.4.5), initially during standard vantage point watches and subsequently through targeted golden eagle surveys (Northern Ecological Services 2016, 2017, 2018a and 2018b).

10.7.32 The viewsheds of the Gordonbush Wind Farm post-construction monitoring do not encompass the Proposed Varied Development site but the observations nonetheless provide insight into golden eagle flight activity in the wider area, with sightings concentrated outside the Gordonbush and Gordonbush Extension areas, to the southeast.

10.7.33 The presence of golden eagle territories in the wider area was known at the time of the 2015 ES, with one putative territory (site code B/S26) at distance to the south, and one to the east (site code B/S45). Both Gordonbush and Gordonbush Extension fall within the putative territory B/S45 boundary but were judged to be of sufficient distance from its centre to have no significant effect on the eagles. Both eagle territories were also sufficiently distant from the Caithness and Sutherlands Peatlands SPA that their birds were not considered to be SPA-associated pairs.

10.7.34 At the time of the early monitoring at Gordonbush, Northern Ecological Services (2016) reported two golden eagle flights within the northeastern extremity of the Gordonbush Wind Farm survey area (turbines plus a 500m buffer) (the birds appeared to turn away from Gordonbush turbine 35). Northern Ecological Services (2017) reported increased golden eagle activity compared to previous surveys, with 11 flights recorded in the wind farm plus 500m buffer area. A further 13 flights were recorded 'just outside the south-east boundary of the survey area'. Over the 2017/18 winter, five flights were recorded within the 500m buffer, but 48 flights were recorded in all. The one eagle seen to fly over part of the wind farm did so well above turbine height. Northern Ecological Services (2018b) reported 51 flights, of which 43 were more than 500m from the Gordonbush Wind Farm turbines. Two of the eight closer flights were

over the Gordonbush Wind Farm (two eagles flying together on a day when the turbines were not operational).

10.7.35 In combination, these observations, involving display flights and multiple records of different aged birds interacting to the south and southeast of Gordonbush Wind Farm, were indicative of a possible attempt by a pair to establish a new territory, incorporating (presumably) a western part of the current putative territory B/S45 and (possibly) an eastern part of the current putative territory B/S26.

10.7.36 In light of this possibility, specialist habitat suitability modelling was carried out for the Proposed Varied Development (Whitfield and Fielding 2018 – see Confidential Annex Appendix 10.4). As noted above, the surveys completed by Northern Ecological Surveys did not cover the Extension, and therefore the flight activity (shown in Figure 3 of Appendix 10.4) is not a definitive indication of current flight activity for this species over the Extension site. The flight data therefore cannot be compared to the activity previously recorded in the 2015 ES surveys (it was negligible, even with vantage point surveys that did cover the Extension), nor can it be used for standard collision risk modelling.

10.7.37 As posited by Whitfield and Fielding (2018) however, (and Fielding *et al.* Unpublished), understanding of golden eagle behaviour in proximity to wind farms has since reached the stage where collision risk is no longer judged a significant risk. This conclusion has been arrived at given evidence of macro (and meso) avoidance of turbines by golden eagles in Scotland. This conclusion has been reached from a combination of (i) post-construction monitoring at Scottish wind farms (e.g. Walker *et al.* 2005), (ii) consideration of the Predicting Aquila Territory (PAT) model (McLeod *et al.* 2002), and (iii) recent satellite tagging of golden eagles.

10.7.38 Building on insights from all these sources, Whitfield and Fielding (2018) conclude that almost total displacement of golden eagles takes place as a result of wind farm construction, albeit birds will occasionally fly at height over turbines (well above collision risk height). As displacement and collision are mutually exclusive, rather than proposing a revised avoidance rate for collision risk modelling (CRM), they conclude CRM is no longer necessary for golden eagle impact assessment. In its place they propose the testing of displacement significance using of a new model of golden eagle ranging, developed and tested using field and satellite tagging data, and named the Golden Eagle Ridge Model (GERM). Therefore, the absence of flight activity surveys over the Proposed Varied Development does not inhibit the robust assessment of impacts on the existing or potentially new golden eagle territories.

10.7.39 Results from modelling of relative habitat importance for golden eagle for Gordonbush and the Extension using GERM demonstrate there is relatively limited preferred habitat within these turbine areas (and surrounding 500m buffers from turbines) (see Figure 6, 7 and 8 of Appendix 10.4). The area lost to displacement from Gordonbush and the Extension amounts to only 2.5% of preferred habitat available within 5km and 0.15% within 10km of these locations. On this basis, having considered Whitfield and Fielding's (2018) findings, it is considered that there would be no significant impact from the Proposed Varied Development, alone or cumulatively with Gordonbush Wind Farm on the capacity of the landscape to support golden eagles. Notably, given the extent of preferred habitat to the southeast of Gordonbush and the Extension, Whitfield and Fielding (2018) conclude there is ample scope to accommodate the potential new territory to the southeast, in addition to the existing B/S45 territory. Furthermore, as GERM does not predict suitable/preferred habitat to the west and northwest of both locations, there is no apparent prospect that the wind farms could act as a barrier to eagle movements from the east.

10.7.40 For completeness and given that the GERM analysis is a relatively new analytical tool, Whitfield and Fielding (2018) undertook PAT modelling for the B/S45 territory (see Figure 5 of Appendix

10.4)[3]. Results showed that even within a 500m buffer of the Extension, the predicted loss of ranging habitat to the Proposed Varied Development was 0.17% of available habitat. They comment that given the Extension is peripheral to the B/S45 range, and largely unsuitable habitat away from ridge features, that this result is to be expected. The loss to the 500m around Gordonbush Wind Farm was 1.92%, which was also unsurprising given it is towards the edge of range and largely away from ridges. Overall therefore, the results of PAT modelling predict the cumulative loss of B/S45 ranging habitat to Gordonbush Wind Farm and the Proposed Varied Development respectively to be 1.92 + 0.17 = 2.09%. They conclude this is negligible, individually and cumulatively.

10.7.41 Both the GERM and PAT modelling conclude that both Gordonbush Wind Fam and the Extension are situated in locations which have negligible attractiveness for golden eagles.

10.7.42 Finally in relation to golden eagles, consideration has been given to potential impacts on the Caithness and Sutherland Peatlands SPA, given that breeding golden eagle are one of its qualifying species. The 2015 ES and its associated Habitats Regulations Assessment (HRA) concluded that the putative territory B/S45 was too distant from the SPA to be connected. The putative territory B/S26 is further away still, and therefore would also have no SPA connectivity. In light of these conclusions, there is no requirement to re-examine the HRA for this species, for the Proposed Varied Development, either in isolation or in combination with other plans or projects.

10.7.43 Having examined the evidence and conclusions presented by Whitefield and Fielding (2018) in Appendix 10.4, the remaining safeguard for golden eagles is through the deployment of the Ecological Clerk of Works, to ensure there is no disturbance to this species (as noted in 10.1.3 and 10.10).

10.8 Review of Conservation Value of the Resident Bird Species

10.8.1 The conservation value assigned to the target species in the 2015 ES has remained consistent, with the exception of curlew. At the time of the previous assessment, curlew was a UKBAP species and common in the region and so is assessed as having Regional/Local conservation status. Only one pair was recorded within the breeding bird assessment area however (within 500m of the proposed turbine positions; see section 10.4.1) in 2012 (Appendix 10.2: Bird Survey Figures from 2015 ES (Figure 10.2) and the species was not recorded in the survey area in 2013. The site was therefore evidently not an important one for this species. From the survey results, it was not judged to be a permanent resident on the site and its conservation value there was assessed as Low. Curlew are now red-listed birds of conservation concern due to widespread and significant declines across much of its range. However, the conservation value of the site is still assessed as low, given the very limited presence recorded.

10.9 Potential Effects

10.9.1 The specific details of potential effects are set out below, updated for each phase of the Proposed Varied Development (construction, operation and maintenance, and decommissioning).

Construction Phase

Habitat Loss

10.9.2 Construction of the wind turbines and access tracks would involve the loss of a very small percentage of the available habitat (see Chapter 8: Ecology for habitat loss figures, specifically

[3] Although flight activity south of Gordonbush and southeast of the Proposed Varied Development were indicative of a possible attempt by a pair to establish a new territory, it is not possible to establish the location of a putative territory centre for this (B/S26) and therefore it is not considered possible to run a PAT model for this territory (Phil Whitefield. *pers. comm.*).

Table 8.8), and would be less than for the Consented Development. Part of the construction area would be restored and part subject to permanent loss to the footprint of the wind turbine bases and access tracks. There are no critical bird habitat features, such as lochs (used for nesting by divers) or cliffs (used for nesting by raptors, such as peregrines), on or near the Proposed Varied Development site, and due to the reduced number of turbines and associated infrastructure, temporary and permanent habitat loss would be reduced, compared to the Consented Development. The effect of habitat loss is assessed as being of minor and **not significant**.

Disturbance

10.9.3 Outside the breeding bird season (March to July), disturbance due to construction activities is assessed for the resident bird species as being a short-term effect of very low magnitude and **not significant**.

10.9.4 If construction is carried out during the bird breeding season**,** between April and July, there is a risk of disturbance to nesting birds, although no particularly sensitive species, such as raptors or waders were recorded breeding on the Proposed Varied Development site. Given the reduced number of turbines, the extent of construction disturbance would be reduced, and associated risk to nesting birds therefore lower. The magnitude of disturbance is still considered likely to be medium magnitude for all of resident bird species however, so in the absence of mitigation, the effect is therefore considered to be **moderate and significant**.

Nest Destruction

10.9.5 Although diminished for the same reasons above, if construction is carried out during the bird breeding season, there is a risk that birds' nests might be destroyed by trampling or the operation of machinery. The deliberate or careless destruction of birds' nests is an offence under the Wildlife and Countryside Act (as amended). Such risks are therefore still considered to be short-term and of medium magnitude. In the absence of mitigation, the effect is considered to be **moderate and significant**.

Operational Phase

Disturbance

10.9.6 In light of the fact that the activities of personnel during the operational phase of the wind farm being limited to wind farm tracks and turbine bases, disturbance to birds is assessed as having an effect of low magnitude and **not significant**.

Collision Risk

10.9.7 There is a potential risk of collision with turbines for geese flying over the Proposed Varied Development site, and in light of the larger proposed turbines, collision risk monitoring has been re-run for the species for which flight activity was recorded.

Geese

10.9.8 Three flocks of greylag geese, totalling 91 birds (Table 10.9), and three flocks of pink-footed geese, totalling 606 birds (Table 10.11), were recorded passing through the Consented Development's collision risk zone (i.e. flights within collision risk height band 20 – 150m).

10.9.9 In order to calculate the collision risk for the Proposed Varied Development's larger turbines from the 2015 ES flight data, it was assumed all geese flights recorded in the >150m flight band (Table 10.9 and 10.11) were within the collision risk zone. This is unlikely to have been the case (as migrating geese typically fly higher), but this precautionary assumption was necessary because there was no record of the height these birds actually flew at. The methodology and full workings of the collision risk calculations are shown in Appendix 10.1. This section summarises the revised results of the calculations and assesses the effect on the birds flying over the survey area.

10.9.10 The total number of collisions predicted for the whole goose wintering period for the Consented Development was 0.33 greylag geese and 2.04 pink-footed geese per year, assuming the current SNH-recommended avoidance rate of 99.8% (SNH 2010b). The up-dated collision risk rate for the Proposed Varied Development is given in Table 10.14.

Table 10.14: The Estimated Number of Collisions per Year by Greylag and Pink-footed Geese

Species	Greylag goose	Pink-footed goose
Collisions per year, in the absence of avoidance	186	1,130
Collisions per year, assuming 99.8 % avoidance	0.37	2.26

10.9.11 To assess the significance of the predicted collisions by geese, it is necessary to estimate the size of the goose population affected. The geese recorded flying over the survey area occurred almost exclusively during the spring and autumn migration periods (recorded in April and October/November) and so were almost certainly on migration through the area. They were unlikely to have been on foraging flights from a nearby roost site since none is known in the area. Since the birds cannot be attributed to a local population, it is appropriate to consider the predicted number of collision casualties in relation to the size of the regional population. The counts made by the Wildfowl and Wetlands Trust in their Highland region in 2012/13 recorded 13,207 greylag geese and 33,171 pink-footed geese (Mitchell, 2013). The predicted number of collisions shown in Table 10.14 make up less than 0.01% of the regional populations of both greylag geese and pink-footed geese. This percentage is well below the value of 1% of the population generally considered to be the criterion for a significant effect. Consequently, the effect of collision is assessed as being of low magnitude and **not significant**.

10.9.12 The single record of golden plovers flying over the survey area (Table 10.8) is considered to be an occasional occurrence, which does not provide sufficient data to establish the average number of birds which pass over the area per year. Consequently, it is not possible to estimate the collision risk for this species, but the very low level of occurrence suggests strongly that the risk of collision by golden plovers is not a likely significant effect.

Displacement

10.9.13 No sensitive species (e.g. raptors or golden plovers) were found in the development area, so there are none to be displaced. The two species of conservation concern found in the assessment area, red grouse and skylarks, are unlikely to be displaced from the site. There will therefore be no significant impact of either of the species.

Decommissioning Phase

10.9.14 Impacts during decommissioning are considered likely to be broadly similar to those in the construction phase (above), although it is not possible to predict precisely what activities would take place, or what bird populations would be present, at that time. It is anticipated that a decommissioning plan would include bird surveys so that prior to decommissioning, potential impacts can be assessed.

10.10 Mitigation

10.10.1 Since all the potential effects of the Proposed Varied Development on birds, apart from risks to nests, are assessed as being of low magnitude and not significant, no mitigation apart from protection of nests (and avoidance of disturbance to Annex 1, Schedule 1A and A1 species) during the construction phase, is required. This is explained below.

Disturbance and Destruction Risk to Nests During Construction

10.10.2 Since the effect of disturbance outside the bird breeding season is assessed as being of low magnitude and not significant, no mitigation is considered necessary if construction is carried out during this period. If construction overlaps with the April to July breeding season, in

accordance with Condition 24 of the existing consent, an Ecological Clerk of Works will be retained for the Proposed Varied Development in order to ensure nesting birds are protected.

10.10.3 Where construction is scheduled during the nesting period (April to July inclusive), the following measures to protect nesting birds will be implemented. These measures are consistent with the Consented Development and are detailed within the Schedule of Mitigation (see Appendix 4.2):

- A pre-construction survey, started in March, to check whether any birds are settling to nest close to proposed access tracks or construction sites, where there might be a risk of the nest being destroyed;
- Monitoring of construction sites throughout the nesting season, to detect birds settling to nest on areas close to construction activity;
- Implementation of deterrence measures in March within potential construction sites to move any such birds discovered at an early stage of settling;
- Postponement of construction activities which would risk disturbance or the destruction of a bird's nest, until deterrence or nest protection measures have been put in place; and
- Protection of any nests discovered.

10.11 Monitoring

10.11.1 SNH guidance exists (SNH 2009a, 2009b) to inform monitoring of breeding birds and flight activity within 500m of the turbines. It is proposed however, that any post-construction bird monitoring for the Proposed Varied Development be agreed with SNH in light of the monitoring scope and results from the adjoining Gordonbush Wind Farm. Insights gained from the Gordonbush Wind Farm bird monitoring may negate the need for any additional monitoring at the Proposed Varied Development (specifically, if post-construction monitoring shows key species are absent and levels of bird activity are low). Should monitoring be required, the scope, duration and reporting will be included as part of the HMP, secured through Condition 25 of the existing consent. There would be advantages in synchronising the surveys so that a more complete picture can be obtained across the full wind farm.

10.11.2 Although no adverse effects are predicted to golden eagle, SSE are committed to completing additional monitoring of golden eagles in the putative territory B/S45 to establish the birds' breeding success. Monitoring would also cover the possible new pair within the area if they are able to successfully establish a territory, also to determine breeding success.

10.12 Assessment of Residual Effects

10.12.1 Any residual effects of habitat loss, disturbance and collision risk remaining after mitigation are assessed as being of low magnitude and not significant (Table 10.15).

Table 10.15: Residual Effects

Effect	Receptor	Potential significance	Mitigation	Residual significance
Habitat loss	Breeding birds	Not significant	None required	Not significant
Disturbance (winter)	Wintering birds	Not significant	None required	Not significant
Disturbance (spring)	Breeding birds	Moderate	Nest protection	Not significant
Nest destruction	Breeding birds	Moderate	Nest protection	Not significant
Collision risk	Overflying geese	Not significant	None required	Not significant

10.13 Cumulative Effects

10.13.1 Since any residual effects on birds are assessed as being of low magnitude and not significant, there would be no contribution by the Proposed Varied Development to cumulative effects with other developments in the area. In particular, the predicted numbers of collisions by greylag

geese and pink-footed geese are less than 0.01% of their respective regional populations, i.e. very close to zero effect. Consequently, the contribution to any cumulative effect of other developments would not be measurable (even to the second decimal place) and is assessed as not significant.

10.14 Effect on the Existing Gordonbush HMP Objectives

10.14.1 Measures being carried out under the existing Gordonbush HMP in the area of the Proposed Varied Development, are unlikely to significantly affect bird populations on the Proposed Varied Development site, since the sward there is already heterogeneous (see Chapter 8: Ecology).

10.14.2 As a consequence, the Proposed Varied Development is considered unlikely to have a significant effect on the objectives of the existing HMP in relation to birds.

10.14.3 Details of the HMP for the Proposed Varied Development are provided in Chapter 8.

10.15 Comparison of Effects between Proposed Varied Development and Consented Development

10.15.1 Table 10.16 compares the impacts of the Consented and Proposed Varied Developments. It shows the Proposed Varied Development will not have significant residual effects on birds.

Table 10.16: Comparison of Residual Effects

Effect	Feature	Consented Development Potential Significance	Consented Development Mitigation	Consented Development Residual Significance	Proposed Varied Development Residual Significance
Habitat loss	Breeding birds	Not significant	None required	Not significant	No Change
Disturbance (winter)	Wintering birds	Not significant	None required	Not significant	No Change
Disturbance (spring)	Breeding birds	Moderate	Nest protection	Not significant	No Change
Nest destruction	Breeding birds	Moderate	Nest protection	Not significant	No Change
Collision risk	Overflying geese	Not significant	None required	Not significant	No Change

10.16 Conclusions

10.16.1 It is considered that there would be no likely significant effect of the Proposed Varied Development on birds through habitat loss, disturbance outside the bird breeding season, displacement or collision risk. If construction is carried out during the bird breeding season, potential disturbance to nesting birds would be mitigated by appropriate deterrence and nest protection measures implemented by the Ecological Clerk of Works (ECoW). The ECoW would also be responsible for avoiding potential disturbance to golden eagle, both during the nesting and non-nesting season (given the species' Schedule 1A and A1 status). The requirement for an ECoW is secured through Condition of Consent 24.

10.16.2 In conclusion, it is considered that there would be no likely significant residual negative effects of the Proposed Varied Development on birds through habitat loss, disturbance, displacement or collision risk. Furthermore, there would be no adverse effect on the integrity or bird populations of the Caithness and Sutherland Peatlands SPA. There would also be no negative effect on the bird populations of the Gordonbush Estate Habitat Management Plan area.

10.16.3 Overall, the effects of the Proposed Varied Development on birds do not vary materially from those of the Consented Development.

10.17 References

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