Cloiche Wind Farm: Additional Information

Volume 1: Main Report

July 2022

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Preface

SSE Generation Ltd (SSEG), hereby known as "the Applicant," is proposing to construct a new onshore wind farm, called 'Cloiche Wind Farm", to generate renewable electricity from wind power. The proposed wind farm is located on Glendoe and Garrogie Estates, adjacent to the operational 66 turbine Stronelairg Wind Farm and the 100 Megawatt (MW) Glendoe Hydroelectric Scheme, and is approximately 11 kilometres (km) south-east of Fort Augustus.

SSE Renewables Development (UK) Limited (SSE Renewables), "the Developer" submitted an application on behalf of the Applicant in April 2020 to the Scottish Ministers under Section 36 of the Electricity Act 1989 for consent, together with a direction under section 57(2) of the Town and Country Planning (Scotland) Act 1997 for deemed planning permission to be granted, to construct and operate Cloiche Wind Farm. The application sought consent for a generating station consisting of a wind farm with up to 36 Wind Turbine Generators (WTGs) with a maximum tip height of up to 149.9m, supported by ancillary development. An EIA Report (April 2020) accompanied the application.

Since submission of the application, changes have been made to the layout of the proposed wind farm following consultation responses from The Highland Council (THC), NatureScot and the Cairngorms National Park (CNP), which includes removing seven turbines (Turbines 20, 21, 22, 23, 27, 28 and 29), and associated infrastructure.

The Applicant has prepared this report to identify any relevant changes to the matters dealt with in the EIA Report (April 2020). This has been done in the expectation that Ministers will treat this report as Additional Information under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations). The purpose of the Additional Information is to demonstrate the nature and extent of any change in the assessment of environmental effects that would result from the proposed changes, or record where there is no change.

This Additional Information is intended to supplement the information already provided in the EIA Report (April 2020), and therefore should be read alongside the EIA Report.

This Additional Information is available for viewing online at https://www.sserenewables.com/onshore-wind/in-development/cloiche/ or on the Scottish Government Energy Consents website at www.energyconsents.scot.

Copies of the Additional Information may be obtained from SSE Generation Limited (contact: SSE Renewables, FAO John Appleton, 1 Waterloo Street, Glasgow, G2 6AY or via email at john.appleton@sse.com) at a charge of £350 for a hard copy, or on electronic USB free of charge.

Any representations in respect of the Additional Information may be submitted via the Energy Consents Unit website at www.energyconsents.scot/Register.aspx; by email to The Scottish Government, Energy Consents Unit mailbox at representations@gov.scot or by post, to The Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the proposal and specifying the grounds of representation.

Representations should be dated, clearly stating the name of the project (in block capitals), full return email and postal address of those making representations. Representations sent by email to representations@gov.scot will receive acknowledgement.

All representations should be received not later than the date falling 30 days from the date of the last published notice, although Ministers may consider representations received after this date. Additional Information which is submitted by the Applicant will be subject to further public notice, and representations to such information will be accepted as per the advert.

1. Introduction

1.1 Background

1.1.1 The Applicant, is proposing to construct and operate a new wind farm, 'Cloiche Wind Farm,' located on the Glendoe and Garrogie Estates, adjacent to the operational 66 turbine Stronelairg Wind Farm and the 100 Megawatt (MW) Glendoe Hydroelectric Scheme approximately 11 kilometres (km) south-east of Fort Augustus, as shown on **Figure 1.1: Location Plan**.

1.1.2 The Developer submitted an application in April 2020 to the Scottish Ministers under Section 36 of the Electricity Act 1989 for consent, together with a direction under section 57(2) of the Town and Country Planning (Scotland) Act 1997 for deemed planning permission to be granted, to construct and operate the proposed Cloiche Windfarm. The application sought consent for a generating station consisting of a wind farm with up to 36 Wind Turbine Generators (WTGs) with a maximum tip height of up to 149.9m, supported by ancillary development.

1.1.3 Since submission of the application, changes have been made to the layout of the 36 Turbine Scheme following consultation responses from THC, NatureScot and CNP, which includes removing seven turbines (Turbines 20, 21, 22, 23, 27, 28 and 29), and associated infrastructure (hereafter referred to as the '29 Turbine Proposed Development').

1.1.4 The Developer has prepared this report to confirm the design changes and to identify any consequential revisions to the matters dealt with in the EIA Report (April 2020). This has been done in the expectation that Ministers will treat the report as Additional Information under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

1.1.5 This Additional Information (AI) has been prepared to demonstrate the nature and extent of any change in the assessment of environmental effects that would result from the changes to the wind farm design layout (as detailed in **Chapter 2** of this report), or record where there is no change. A review of the assessment contained in the EIA Report (April 2020) has been provided in respect of each of the environmental topics that were assessed in the EIA Report (April 2020) taking account of any consequential changes or additional changes to the layout and associated infrastructure. Any changes to the likely significant effects on the environment previously reported upon are identified.

1.1.6 This report comprises four volumes, as follows:

- Volume 1: Additional Information – Main Report;
- Volume 2: Figures;
- Volume 3: Visualisation Pack; and
- Volume 4: Appendices.

1.2 Planning Policy

1.2.1 This Section of the AI has been prepared to review and provide an update on published policy and guidance since the submission of the application under Section 36 of the Electricity Act 1989 ("the 1989 Act") in May 2020.

1.2.2 Since May 2020 the relevant policy context has further evolved in respect of renewable energy and climate change matters.

1.2.3 This AI should be read in conjunction with EIA Report (April 2020) Chapter 6 and the previously submitted Planning Statement.

1.2.4 This Section is structured as follows:

- Section 1.2 outlines updates to the renewable energy policy framework;
- Section 1.3 considers updates to national planning policy including the Draft National Planning Framework 4 (NPF4) in the context of the Proposed Development; and
- Section 1.4 presents updated policy conclusions.

Renewable Energy Policy

Update to the Climate Change Plan 2018 – 2032

1.2.5 The update to the Climate Change Plan 2018 – 2032 was published in December 2020 and updates the Scottish Government's 2018 Climate Change Plan under the provisions of the 2019 Act. The plan sets out the Scottish Government's approach to delivering a green recovery from the Covid-19 pandemic and sets out a pathway to deliver the climate change targets set out in The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 ("the 2019 Act").

1.2.6 Chapter 1 of the update relates to electricity. Paragraph 3.1.4 notes the importance of a decarbonised electricity sector in delivering net-zero targets:

"As Scotland transitions to net zero, a growing and increasingly decarbonised electricity sector is critical to enabling other parts of our economy to decarbonise – notably transport, buildings and industry."

1.2.7 Paragraph 3.1.8 makes clear the Scottish Government's intention to actively facilitate decarbonised electricity generation through the planning process:

"Planning has been, and will remain, a critical enabler of rapid renewables deployment in Scotland. The position statement on our fourth National Planning Framework (NPF4), published in November, makes clear the Scottish Government's intention to actively facilitate decarbonised electricity generation and distribution."

1.2.8 The draft NPF4 is discussed in detail below. Once adopted NPF4 will incorporate Scottish Planning Policy (SPP) and will have the status of the development plan for planning purposes.

1.2.9 The Update to the Climate Change Plan 2018 – 2023 highlights the changing public policy at all levels of Government in emphasising the urgent need for more renewable energy development.

Scotland's Energy Strategy Position Statement

1.2.10 The Energy Position Statement was published in March 2021 and provides an overview of the Scottish Government's key priorities for the short to medium-term to ensure a green economic recovery aligned to net-zero ambitions.

1.2.11 At Page 22 the Energy Position Statement states:

"The continued growth of Scotland's renewable energy industry is fundamental to enabling us to achieve our ambition of creating sustainable jobs as we transition to net

zero. The Scottish Government is committed to supporting the increase of onshore wind in the right places to help meet the target of Net Zero."

1.2.12 In relation to the economic benefits associated with onshore wind investment, the Energy Position Statement continues:

"In 2019, onshore wind investment in Scotland generated over £2 billion in turnover and directly supported approximately 2,900 full-time equivalent jobs across the country."

Onshore Wind Policy Statement Refresh 2021: Consultative Draft

1.2.13 The Onshore Wind Policy Statement Refresh 2021: Consultative Draft was published in October 2021 for a period of consultation to 31 January 2022. The draft invites views on the Scottish Government's ambition to secure an additional 8 – 12 GW of installed onshore wind capacity by 2030, how to tackle the barriers to deployment, and how to secure maximum economic benefit from these developments.

1.2.14 The Consultative Draft emphasises the Scottish Government's commitment to renewable energy generation and onshore wind. Paragraph 1.2.1 states:

"The Scottish Government has had a long-standing target to generate the equivalent of 100% of gross Scottish electricity consumption from renewable sources by 2020, with provisional figures showing that Scotland reached 95.9% in 2020. This target, together with our record of strong support for renewables using the powers of legislation available to us over the past two decades, exemplifies our support for onshore wind and belief in its effectiveness."

1.2.15 With regards to the contribution onshore wind can make to achieving net-zero targets, Paragraph 2.1.1 states:

"The transition to net zero means that our demand for green electricity will increase substantially over the course of the next decade. This means that a consistently higher rate of onshore wind, and other renewables capacity, will be required year on year."

National Planning Policy

Draft National Planning Framework 4

1.2.16 The Draft NPF4 was laid in Parliament on 10th November 2021. The final version of NPF4 is due to be published for approval and adoption in summer 2022.

1.2.17 It is acknowledged that Draft NPF4 is subject to ongoing parliamentary scrutiny and public consultation, and therefore it will be up to the Scottish Ministers to determine the weight to be afforded to it in reaching their decision.

Part 1 – National Spatial Strategy

1.2.18 Part 1 – National Spatial Strategy, sets out a shared vision where each part of Scotland can be planned and developed to create Sustainable, Liveable, Productive and Distinctive places. The strategy places significant emphasis on supporting the transition to net zero, the recovery from Covid-19 and creating better places.

1.2.19 The 29 Turbine Proposed Development can draw support from the National Spatial Strategy, including:

- Sustainable places – supports the transition to net-zero and seeks to transform the way we use buildings and land. Acknowledges the real threat and heightened risk

that the climate emergency poses to the planet and the importance of investing in reducing carbon emissions; and

- Productive places – supports future places which will attract new investment, build business confidence, stimulate entrepreneurship, and facilitate future ways of working – improving economic, social, and environmental wellbeing.

Part 2 – National Developments

1.2.20 Draft NPF4 identifies significant developments of national importance which support the delivery of the spatial strategy. 18 National Developments are proposed, ranging from single large scale projects or collections and networks of several smaller scale proposals. The designation as a National Development means that the principle of the development does not need to be agreed in later consenting processes, providing more certainty for communities, business and investors. Appropriate consents and associated impact assessments are still required in line with statutory obligations.

1.2.21 '*Strategic Renewable Electricity Generation and Transmission Infrastructure*' is identified as a National Development within the Draft NPF4. Electricity generation from renewables of or exceeding 50 MW in capacity is designated as a National Development. The 29 Turbine Proposed Development would therefore be classed as a National Development as it would have an estimated capacity in excess of 50MW.

1.2.22 The supporting text emphasises that *"a large increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets"* and has the potential to support jobs and business investment with wider economic benefits.

1.2.23 The identification of large renewable energy developments as National Developments within Draft NPF4 further emphasises the importance of the 29 Turbine Proposed Development in the context of emissions reductions targets.

Part 3 – National Planning Policy

1.2.24 Part 3 incorporates SPP and contains detailed national policy across a wide range of topics. These are grouped around the following themes:

- Sustainable Places (Universal Policies);
- Liveable Places;
- Productive Places; and
- Distinctive Places.

1.2.25 The policies of relevance to the 29 Turbine Proposed Development are outlined and assessed below.

Policy 2 - Climate Emergency

1.2.26 Policy 2 states:

"When considering all development proposals significant weight should be given to the Global Climate Emergency."

1.2.27 Policy 2 also confirms that in decision making the scale of the contribution of the development proposals to emissions in relation to emissions reduction targets should be taken into account.

1.2.28 This represents the first time a planning policy document has explicitly confirmed that significant weight should be given to the Global Climate Emergency. As a result, the 29 Turbine Proposed Development can draw significant support from Draft NPF4 Policy 2, as the updated calculations of total CO^2 emission savings and payback time for the 29 Turbine Proposed Development indicates the overall payback period of approximately 4.2 years, when compared to the fossil fuel mix (the existing energy mix within the UK) of electricity generation.

1.2.29 The 29 Turbine Proposed Development can therefore draw significant support from Draft NPF4 Policy 2 and its contribution to achieving emissions reductions targets should also be viewed positively in the policy balance.

Policy 3: Nature Crisis

1.2.30 Policy 3 sets out that:

"Development proposals should contribute to the enhancement of biodiversity, including restoring degraded habitats and building and strengthening nature networks and the connections between them."

1.2.31 Additionally:

"Any potential adverse impacts of development proposals on biodiversity, nature networks and the natural environment should be minimised through careful planning and design. Design should take into account the need to reverse biodiversity loss, safeguard the services that the natural environment provides and build the resilience of nature by enhancing nature networks and maximising the potential for restoration."

1.2.32 The 29 Turbine Proposed Development includes an Outline Habitat Management Plan (Technical Appendix 4.5) which makes provision to restore and enhance c.150 ha of blanket bog habitat, restoring degraded habitats as set out in Policy 3.

Policy 19: Green Energy

1.2.33 The introductory text to Policy 19 states that the planning system should support all forms of renewable energy development and energy storage as a key contributor to achieving net zero emissions by 2045.

1.2.34 Policy 19 criterion B sets out that *"development proposals for all forms of renewable energy… should be supported in principle".*

1.2.35 Draft NPF4 does not carry forward the spatial framework for onshore wind energy development set out in SPP, instead stating at Policy 19 criterion E that:

"Development proposals to repower, extend and expand existing wind farms and for the extension of life to existing windfarms should be supported unless the impacts identified (including cumulative effects) are unacceptable."

1.2.36 Whilst it is acknowledged there will be some landscape and visual impacts associated with the 29 Turbine Proposed Development (refer to Section 3), as there were for the 36 Turbine Scheme assessed in the EIA Report, these will be localised and should be balanced against the valuable contribution it will make as a cost effective and established form of renewable energy development which constitutes sustainable development and makes a valuable contribution to climate change targets.

1.2.37 The 29 Turbine Proposed Development is adjacent to an operational windfarm, and the EIA Report (for the 36 Turbine Scheme) and this subsequent AI (for the 29 Turbine Proposed Development) does not identify any significantly unacceptable impacts (including cumulative effects). The reduction in turbine number and associated infrastructure from the 36 Turbine Scheme to the 29 Turbine Proposed Development will be beneficial.

1.2.38 The removal of turbines would lead to noticeable improvements in Landscape and Visual terms in comparison with the 36 Turbine Scheme. The reduced footprint does not, however, alter the significance of any other effects reported in the EIA Report and is considered acceptable in the context of Policy 19, it is considered that the proposals can draw significant support from Policy 19.

1.2.39 Policy 19 criterion K also sets out specific considerations which proposals for renewable energy developments must take into account. These are largely as presently set out at SPP Paragraph 169 and Highland-Wide Local Development Plan (HwLDP) Policy 67, with minor wording changes and updates. The previous assessment of the 36 Turbine Scheme in terms of SPP Paragraph 169 and HwLDP Policy 67 set out in the Planning Statement is not repeated here for the 29 Turbine Proposed Development. The further design mitigations in relation to landscape and visual impacts included within the 29 Turbine Proposed Development are considered to be in accordance with SPP Paragraph 169, HwLDP Policy 67 and Draft NPF4 Policy 19. As set out in the previously submitted Planning Statement for the 36 Turbine Scheme, the 29 Turbine Proposed Development is considered to be in accordance with Highland-Wide Local Development Plan (HwLDP) Policy 67 and SPP Paragraph 169.

Summary

1.2.40 The 29 Turbine Proposed Development can draw significant support from the significant emphasis in Draft NPF4 in terms of supporting the transition to net-zero, the weight attributed to the Climate Emergency, and the in-principle support for renewable energy developments.

2. Revision to Proposed Development

2.1.1 The revised layout of the 29 Turbine Proposed Development is shown on **Figure 2.1**. It was prepared following review of consultation responses to the original application for 36 turbines (referred to here as "the 36 Turbine Scheme"), and further consultation with key stakeholders including ECU, THC and NatureScot. An extensive review was undertaken in order to identify if the removal of any of the turbines of the 36 Turbine Scheme would address concerns raised by THC, CNP and NatureScot in response to the application. The review included undertaking detailed ZTV and wireframe analysis of the potential impacts of each of the turbines. Based on this analysis, the 29 Turbine Proposed Development was identified as providing the greatest potential to address the concerns raised by consultees regarding the 36 Turbine Scheme and those raised in the recent decision to refuse Glenshero Wind Farm.

2.1.2 **Table 2.1** provides a summary of where the removal of the seven turbines has resulted in changes between the 36 Turbine Scheme presented in the EIA Report (April 2020) and the 29 Turbine Proposed Development now proposed. These changes are shown on **Figure 2.2**.

Table 2.1: Summary of changes between the 36 Turbine Scheme and the 29 Turbine Proposed Development

Infrastructure Element	36 Turbine Scheme (April 2020)	29 Turbine Proposed Development (July 2022)	Summary of Changes
No. of Turbines	36	29	Removal of seven turbines
Tip Height	Up to 149.9m	Up to 149.9m	No change
Rotor Diameter	Indicative diameter of 136m	Indicative diameter of 136m	No change
Hub Height	Indicative hub height of 86m	Indicative hub height of 86m	No change
Access Track Length	Approx. 26km new access tracks. Approx. 29km existing tracks potentially requiring upgrades	Approx. 20.64 km new access tracks. Approx. 29 km existing tracks potentially requiring upgrades	A reduction in track length of approx. 5.36km associated with the removal of seven turbines.
Turbine Foundations and Hardstandings	Temporary Land Use: 70,969m^2 Permanent Land Use: 129,992m^2	Temporary Land Use: 57,169m^2 Permanent Land Use: 104,716m^2	Reduction in Temporary Land Use: 13,800m^2 Reduction in Permanent Land Use: 25,276m^2
Borrow Pits	Comprising both new and on-site existing borrow pits.	Comprising both new and on-site existing borrow pits.	Removal of one borrow pit
Substation and Operations Building	Requirement for a new on-site substation and operations building.	Requirement for a new on-site substation and operations building.	No change
Temporary Construction Compounds, including concrete batching plant area	Requirement for temporary construction compounds, laydown areas and concrete batching plant.	Requirement for temporary construction compounds, laydown areas and concrete batching plant.	No change
Permanent Met Masts/LiDAR	A single permanent Light Detection and Ranging (LiDAR) station would be required.	A single permanent Light Detection and Ranging (LiDAR) station would be required	No change
Turning Head	None	9 No.	11,917m^2 land take

2.1.3 The site boundary, as illustrated on Figure 2.1: The 29 Turbine Proposed Development, would not change as a result of the revisions.

2.1.4 The turbine locations for the 29 Turbine Proposed Development are unchanged from those presented in the EIA Report (April 2020), albeit Turbines 20, 21, 22, 23, 27, 28 and 29 are now removed. This is shown in **Table 2.2**, with the seven turbines to be removed scored out. Turbine numbering has been retained and corresponds to the numbering which was presented in the EIA Report – Volume 2, Chapter 3: Description of Development (April 2020) and as shown in **Table 2.2**.

Table 2.2: Turbine Grid References

Turbine Number	Grid Reference	Turbine Number	Grid Reference
C1	246783 804218	C19	247940 801628
C2	247321 804180	~~C20~~	~~247944 800942~~
C3	247972 803060	~~C21~~	~~248380 800690~~
C4	247289 802902	~~C22~~	~~248999 800802~~
C5	247084 803411	~~C23~~	~~248496 801189~~
C6	247759 804458	C24	248479 802007
C7	248149 804689	C25	249090 802015
C8	248433 805039	C26	249193 801495
C9	248141 802548	~~C27~~	~~249798 800871~~
C10	247133 802313	~~C28~~	~~249475 800443~~
C11	246917 801717	~~C29~~	~~255605 801455~~
C12	247584 801964	C30	256001 801903
C13	246624 801159	C31	256641 802276
C14	246598 803094	C32	257165 802794
C15	246328 802556	C33	256751 803157
C16	246665 802253	C34	257337 803339
C17	246200 802005	C35	257234 803946
C18	246029 801215	C36	256658 804129

2.1.5 As per the EIA Report (April 2020), turbine positions, their associated hardstandings (and track routes) could be microsited up to 50m where appropriate, in order to avoid or minimise environmental or engineering constraints identified during pre-construction ground investigation, or construction phase excavation works.

3. Landscape and Visual Amenity

3.1 Introduction

3.1.1 The purpose of the additional information presented in this Chapter, is to provide an understanding of how the Landscape and Visual Effects arising from the 29 Turbine Proposed Development (incorporating the removal of seven turbines (Turbines 20, 21, 22, 23, 27, 28 and 29) and associated track infrastructure), compares with those described for the 36 Turbine Scheme layout, as assessed in Volume 2, Chapter 7: Landscape and Visual Amenity of the EIA Report (April 2020).

3.1.2 Relevant sections of Chapter 7 of the EIA Report (April 2020) and the supporting Technical Appendices are referenced as appropriate throughout this Chapter. As such it should therefore be read in conjunction with Chapter 7 of the EIA Report (April 2020).

Assessment Scope

3.1.3 The scope of this review was confirmed in May 2022, following agreement with THC, NS and the Energy Consents Unit (ECU).

3.1.4 Consideration of potential changes to effects on Landscape Character Types (LCTs) and designated and protected landscapes was an important driver in the design of the 29 Turbine Proposed Development, particularly opportunities to reduce potential effects on Wild Land Area 19 and the Cairngorms National Park. Section 3.2 of this report summarises the findings of the review of landscape receptors. The review and interpretation of the improvements to the viewpoints undertaken for the Visual Assessment Review forms the basis of the Landscape Assessment Review aided by the updated ZTV for the 29 Turbine Proposed Development (see Figure 3.3 and 3.4).

3.1.5 The 29 Turbine Proposed Development has the potential to change the effects assessed and presented in Volume 2, Chapter 7: Landscape and Visual Amenity of the EIA Report (April 2020). A brief summary of potential changes to each of the 20 representative viewpoints considered in the EIA Report (April 2020) is provided in Section 3.3 of this report. The review of viewpoints is also followed by a summary of potential changes to effects on settlement and route based visual receptors and cumulative effects.

3.2 Landscape Assessment Review

Summary of Effects of Turbine Removal on Landscape Character Types

3.2.1 Although the 29 Turbine Proposed Development would continue to occupy a similar footprint and have a similar scale and appearance within the wider landscape to the 36 Turbine Scheme, it would noticeably reduce theoretical intervisibility with a number of key landscape character types. Reductions to landscape effects presented in the EIA Report (April 2020) are anticipated from the following landscape character types.

- LCT 238 – Rugged Massif – Lochaber from Minor-Moderate to Minor - The 29 Turbine Proposed Development would reduce the intervisibility with the turbines within the LCT, particularly in Glen Roy / Glen Spey where low level visibility would be largely eliminated, diminishing the potential presence of turbines and human intervention within these areas.
- LCT 231 – Upland Glen – Inverness from Minor-Moderate to Negligible - The 29 Turbine Proposed Development would remove the vast majority of theoretical

intervisibility from this LCT. Intervisibility with the remaining turbines would be very limited and would be experienced in the context of the Stronelairg turbines, reducing their potential influence within the LCT.

- Spey Headwaters – Spey Dam LCA from Minor to Negligible-Minor - The 29 Turbine Proposed Development would reduce the intervisibility of the turbines within the LCT. It would also reduce the intensity of turbines in the western cluster, remove some of the turbines which appear slightly larger and closer to the LCT and improve the sense of containment of the development within the landform 'bowl'.
- Spey Headwaters – Upper Glen of the Spey LCA from Minor to Negligible-Minor - The 29 Turbine Proposed Development would reduce the intervisibility of the turbines within the LCT. It would also reduce the intensity of turbines in the western cluster, remove some of the turbines which appear slightly larger and closer to the LCT and improve the sense of containment of the development within the landform 'bowl'.

3.2.2 Although the 29 Turbine Proposed Development is not anticipated to result in reductions to landscape effects from other landscape character types it would result in an improved composition, reduced intensity and improve the sense of containment of the development within the landform 'bowl' from the wider landscape as described in Technical Appendices 3.1 and 3.2.

Summary of Effects of Turbine Removal on Designated and Protected Landscapes

3.2.3 The improved composition of the 29 Turbine Proposed Development when compared with the 36 Turbine Scheme, is anticipated to lead to a reduction in landscape effects to the WLA 19: Braeroy – Glen Shirra – Creag Meagaidh, largely due to the removal of intervisibility of the turbines, most notably from within the pass between Braeroy and Loch Spey. The anticipated effect from the 36 Turbine Scheme would reduce from Minor-Moderate (not significant) to Minor (not significant) for the 29 Turbine Proposed Development.

3.2.4 However, despite the composition improvements no other changes to the overall effects reported for designated and protected landscapes in the EIA Report (April 2020) on the Cairngorms National Park (CNP) (Minor (not significant)), Wild Land Area 20: Monadhliath (Minor (not significant) with very localised Moderate (significant)), Ben Alder, Laggan and Glen Banchor SLA (Minor (not significant)), Loch Lochy and Loch Oich SLA (Negligible (not significant)), and Loch Ness and Duntelchaig SLA (Minor (not significant)) are anticipated.

<u>Cumulative Effects</u>

3.2.5 As with the findings of the CLVIA in the EIA Report (April 2020), no significant cumulative landscape effects have been identified when considering the addition of the 29 Turbine Proposed Development to the updated baseline cumulative scenario of existing and proposed wind farm sites. This is largely related to the position of the 29 Turbine Proposed Development adjacent to the operational site of Stronelairg, and the Dell site (now changed from a consented scheme to a new scoping development), leading to the appearance of a cohesive cluster of baseline development which would strongly define the character of the landscape in which it would be located.

3.2.6 With the removal of Glenshero from the cumulative baseline (as a result of the refusal of the Glenshero application), there would be very small increases to the landscape effects identified in the EIA Report (April 2020) for two landscape character types as follows:

- Ardverikie Hills Upland LCA from Negligible to Minor; and
- Ben Alder, Laggan and Glen Banchor Special Landscape Area from Negligible to Minor.

3.2.7 Neither of these increases would result in a previously not significant effect becoming significant. The 29 Turbine Proposed Development would reduce the intervisibility with the turbines within the SLA and would reduce the intensity of the western cluster diminishing its influence on the LCA.

3.3 Visual Assessment Review

Comparison of Visual Effects

3.3.1 In terms of assessing any potential change to visual effects, the relevant design change of the 29 Turbine Proposed Development is the removal of seven turbines from the 36 Turbine Scheme presented in the EIA Report (April 2020) along with short sections of track and hardstanding associated with these seven turbines.

3.3.2 A review of the implications arising from the removal of these seven turbines for each representative viewpoint is provided in **Technical Appendix 3.3**. The effect ratings used are as described in the methodology for the Visual Assessment in the EIA Report (April 2020) (Volume 2, Chapter 7, Section 7.9).

Summary of Effects of Turbine Removal on VPs

3.3.3 The review of each VP in relation to the changes arising from the 29 Turbine Proposed Development when compared with the 36 Turbine Scheme, has established that there would be improvements to the appearance of the wind farm from some VPs including VP3: Meall Fuar-mhonaidh, such as improved composition, reduced density of turbines, slightly reduced intensity, stacking and horizontal spread of the western cluster, clearer association and containment within the plateau bowl landform, and removal of some turbines which are slightly more noticeable from some VPs. These improvements would result in reduction for one VP from significant to not significant. Whilst it is not considered that these improvements would change the level of visual effect ratings identified for most of the VPs for the 36 Turbine Scheme, they would result in reduced visual effect ratings for the following VPs:

- VP9: Geal Charn (Monadhliath) from Minor-Moderate to Minor – The removal of Turbine 29 would reduce the prominence of the easter cluster and improve the visual coherence of the 29 Turbine Proposed Development with Stronelairg. Removal of the turbines from the western cluster would also reduce the stacking of turbines and would remove a number of turbines that appear to sit more prominently against the skyline;
- VP11: Carn Liath from Minor-Moderate to Minor – The 29 Turbine Proposed Development would remove some of the closest turbines on the edge of the plateau and thin out the western cluster and reduce the number of turbines visible in the far right of the western cluster;
- VP16: Footpath East of Loch Spey from Minor-Moderate to Negligible – The 29 Turbine Proposed Development would remove any theoretical visibility from this location; and
- VP18: Loch na Lairige from Moderate to Minor - The 29 Turbine Proposed Development would remove the closest and most prominent turbines from the

view. It would also improve the sense of containment of the development within the landform 'bowl' resulting in an improvement to the view and reduction in level of visual effect.

Other Visual Effects

Settlement and Route Based Visual Receptors

3.3.4 The 29 Turbine Proposed Development would lead to a reduction in the number of visible turbines when compared with the 36 Turbine Scheme, seen from some settlement and route based receptors, and in some cases would remove some of the more prominent turbines affecting views. While this would lead to improvements in visual composition and reductions in the density, stacking and horizontal spread of the turbines in views from across the study area, it would also lead to a change in the allocated visual effects rating for three locations:

- RRL4: Garvamore and Garvabeg from Minor-Moderate to Negligible;
- R5: Scottish Hill Track 200: Dalwhinnie to Feagour (Strath Mashie) from Minor to Negligible; and
- R8: Scottish Hill Track 237: Laggan to Roybridge or Glenfintaig Lodge (Spean Bridge) by Leckroy from Minor-Moderate to Negligible.

3.3.5 The 29 Turbine Proposed Development would reduce the majority of visibility of turbines from all of these receptors. Remaining theoretical visibility would be limited to tips of 2 turbines partially filtered by trees which are likely to be generally barely perceptible as an element in the view. This is reflective of the improvement to the view and wider reduction in level of visual effect at lower levels particularly around the south-western part of the CNP.

3.3.6 Although the 29 Turbine Proposed Development would result in widespread improvements to views from across the study area, these are not anticipated to lead to any changed effects ratings for other visual receptors reported in (Volume 2, Chapter 7, Section 7.9), either because of the continued presence of other equally visible turbines, or the peripheral nature of the turbines within existing views. The reductions in effects would mean there was one remaining significant visual effect (VP7: Carn a' Chuilinn (Moderate)), which is a Corbett summit on the plateau, located less than 5km from the closest proposed turbine, to the west of the Proposed Development.

Cumulative Effects

3.3.7 As with the findings of the CLVIA in the EIA Report (April 2020), only one significant cumulative visual effect has been identified for the 29 Turbine Proposed Development: VP7 – Carn a' Chuilinn, located less than 5km to the west of the 29 Turbine Proposed Development. Despite the reduction in turbine numbers, the 29 Turbine Proposed Development would still be closer and more prominent than the baseline developments, and as a result, would lead to an increased prominence of wind turbines within the easterly view. For all other cumulative visual receptors, the effect of the baseline sites would be such that the addition of the 29 Turbine Proposed Development would not form a noticeable addition to the view, or increase prominence of wind turbines in the view. As for the EIA Report (April 2020), where the addition of the 29 Turbine Proposed Development may be noticeable, the prominence of the baseline sites would be such that this would not lead to any noticeable deterioration in the value of the view.

3.4 Conclusions

3.4.1 Changes to the design of Cloiche Wind Farm as a result of the reduction in the number of turbines from 36 to 29 would lead to noticeable improvements in comparison with the 36 Turbine Scheme presented in the EIA Report (April 2020).

3.4.2 Although there would be limited changes to the effects ratings identified and reported in Chapter 7 (Volume 2) of the EIA Report (April 2020), there would be reductions to individual ratings for four Landscape Character Types, one Designated or Protected Landscape and seven Visual Receptors. Of these, one would also represent a reduction from a significant effect to a not significant effect from one visual receptor (VP18: Loch na Lairige). While there would still be one remaining significant visual effect, (VP7: Carn a' Chuilinn comprising a Corbett summit located less than 5 km from the Proposed Development), the overall reduced effects would be reflective of the improved composition of the 29 Turbine Proposed Development as seen and appreciated from the wider area.

4. Ecology

4.1 Introduction

4.1.1 This Chapter of the Additional Information (AI) assesses the likely significant effects[1] of the 29 Turbine Proposed Development with respect to terrestrial ecology. The 29 Turbine Proposed Development incorporates the removal of seven turbines (C20, C21, C22, C23, C27, C28 and C29) from the 36 Turbine Scheme. This Chapter considers the effects of the change to the assessment of Ecology effects set out in the EIA Report (April 2020) Chapter 8 for the 36 Turbine Scheme, which predicted no likely significant residual effects on Important Ecological Features (IEFs) resulting from its construction, operation and decommissioning.

4.1.2 NatureScot objected to the 36 Turbine Scheme on 24th September 2020 stating:

"We object to this proposal due to significant adverse impacts on the nationally important carbon-rich soils, deep peat and priority peatland habitat which are present on the site. In our view the significant effects of the proposal on this area have not been substantially "overcome through siting, design or other mitigation".

4.1.3 The following assessment is based on the fact that all previously proposed mitigation continues to be proposed for the 29 Turbine Proposed Development. and therefore the significance of effects continues to be non-significant for all remaining IEFs. The reduction in turbine numbers would have only beneficial effects on the other IEFs identified in the EIA Report (April 2020).

4.1.4 On this basis, the only IEFs scoped into the detailed assessment of this chapter are bog habitats (comprising blanket bog, wet modified bog and/or dry modified bog).

4.1.5 The Chapter should be read in conjunction with the development description provided in Chapter 3: Description of Development of the EIA Report (April 2020) and **Chapter 2: Revision to Proposed Development** of this AI. It should also be read in conjunction with the other AI Chapters, including **Chapter 6: Hydrology and Hydrogeology**, where there is an overlap or relationship between the assessment of effects. In this Chapter, the assessment accords with the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) "*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*" Version 1.1 - updated September 2019.

4.2 Scope of Assessment

4.2.1 The results of additional updated field surveys have been used to determine the baseline context of the site. The information available provides a robust basis for undertaking an Ecological Impact Assessment (EcIA).

4.2.2 Field surveys predominantly followed the survey guidance that is widely recognised by consultees, including NatureScot (NS). Full details are provided in the accompanying survey reports, which also note where deviations occurred due to issues including adverse weather, health and safety concerns and land access (**Technical Appendix 4.2**).

[1] In this Ecology Chapter, the term "potentially significant effects" is used in the sections prior to the "scope of the assessment" being determined, as it accords with CIEEM guidance. The term "likely significant effects" is used once the scope of the assessment has been determined. The use of this term is not to be confused with Likely Significant Effects (LSEs) as used in the context of a Habitats Regulations Appraisal (HRA).

Study Area

4.2.3 The "Study Area" encompasses the area over which all field data were gathered to inform the assessment presented in this Chapter. The Study Area comprises:

- The site (i.e. the site boundary); and
- The field survey areas (as shown in **Technical Appendix 4.2** (Figures 1 - 11).

4.2.4 As the proposed design has evolved iteratively, the Study Area, and its constituent parts, has been regularly reviewed to ensure that its extent was adequate to enable the assessment of all potentially significant effects on the ecological features identified. Changes to the initial developable area, or the precise nature of the development, have been reviewed in light of the ecological features present (this being informed by the most recent data gathering exercise conducted in 2021) and the potential effects that could occur. At each stage of design evolution, the extent of the Study Area, including all of its components, was tested using the methodology described in Section 4.2 to ensure adequate information was available on which to base an assessment.

Consultation Responses

4.2.5 **Table 4.1** summarises the consultation responses relevant to ecology and nature conservation and provides information on where and/or how they have been addressed in this assessment.

Table 4.1: Consultation Responses

Consultee and Date	Issue Raised	Response/Action Taken
NatureScot 24/09/2020	In the Annex to the letter of the 24th September 2020 a number of issues were raised by NatureScot with respect to the application's Appraisal of Impacts on Habitats. These were divided amongst the following headings: a) Carbon-rich Soils, Deep Peat and Priority Peatland Habitat; b) Proximity of the Monadhliath Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI); c) Appraisal of Impacts on Montane Heath; and d) General Advice on Peatland The objections and observations under a) were: • *the development site is dominated by nationally important carbon-rich soils, deep peat and priority peatland habitat, and most of it satisfies our criteria to be considered of National Interest. This is on account of the number of positive indicators and paucity of negative ones. There are also relatively frequent occurrences of Sphagnum fuscum and Betula nana, indicative of a relative absence of disturbance*; • *although the area includes numerous erosion features, particularly gullies, these are largely revegetated and, on the basis of the evidence, are not having a significant effect on the species complement or habitat quality*; • *the large majority of the habitat losses from the proposed development will be of nationally important, high quality priority peatland habitat;* • *due to the prevalence of nationally important carbon-rich soils, deep peat and high quality priority peatland habitat on the site, micrositing, or removing a proportion of the turbines, is unlikely to change that outcome*; • *the compensatory restoration proposed is of an insufficient scale to offset the anticipated loss and damage to high quality priority peatland habitat. We consider that restoration on a sufficiently large scale is unlikely to be feasible at this site*." Under b) *the main objection was that "A 50m buffer should be maintained between site infrastructure and the boundary of the SAC*."	Commentary has been provided in **Technical Appendix 4.1** which considers the NatureScot objection and correspondence regarding the 36 Turbine Scheme in relation to Scottish Planning Policy (SPP), CIEEM EcIA Guidance (CIEEM, 2019), NatureScot's recent guidance entitled "Advising on carbon-rich soils, deep peat and priority peatland habitat in development management" (NatureScot, 2020) as well as the recent Blarghour Wind Farm Determination (Scottish Ministers, 2021) and the draft update to the National Planning Framework (NPF4, 2021). Update surveys and assessment (**Technical Appendices 4.2 and 4.3**) provide information on the extent of habitats potentially affected by the 29 Turbine Proposed Development. An objective assessment has been prepared of the quality of the peatland and montane habitats that will be potentially affected by the 29 Turbine Proposed Development, including an appraisal of the frequency of target species identified by NatureScot as being indicative of blanket bog of potentially 'national interest'. A more substantial and ambitious package of peatland restoration and habitat management proposals have been developed. These provide assurance that adverse construction impacts could be adequately offset and biodiversity enhancement measures offered. Following a site visit in August 2021, peatland restoration opportunities were presented in **Technical Appendix 4.4 - Habitat Restoration Opportunities**. A more ambitious peatland restoration package has been provided in **Technical Appendix 4.5 - Outline Habitat Management**

Consultee and Date	Issue Raised	Response/Action Taken
	Under c) *the main objection was that "Turbines and other infrastructure should be micro-sited to avoid the loss of any montane heath*." It was noted that turbine C25 is located in an area of montane heath.	**Plan** which is further supported by **Technical Appendix 4.6 Deer Management Plan**. The 29 Turbine Proposed Development ensures that a 50m buffer would be maintained through micro-siting between site infrastructure and the boundary of the SAC. The 29 Turbine Proposed Development has sought to avoid montane heath through sensitive design and would further ensure direct or indirect loss through micrositing. Montane heath habitat only makes up 8.7 hectares (2.4%) of the area within the 50 m buffer zone around the proposed development. Figure 5 (**Technical Appendix 4.2)** shows the location of the H13 montane heath community and illustrates that most of the montane heath is on Meall Caca and small mounds in the south of the survey area to the east of Lochan Iain. **Technical Appendix 4.3** presents habitat loss calculations and limited direct or indirect loss of montane heath habitats as a result of the Proposed Development.
NatureScot (02/12/21)	NatureScot advised that they did not have any issue with the survey work undertaken, but did disagree with the interpretation of the results, particularly in relation to M17b classification and peat depth. NatureScot did however acknowledge that it is not unusual to have different interpretations between technical experts and that there is more than one way to describe the value and condition of a site.	The Habitat and vegetation survey and condition assessment presented in **Technical Appendix 4.2** presents a robust and consistent approach to the survey and data analysis of blanket bog habitats present within the site boundary.
	The original habitats and vegetation surveys had not identified montane heath, which had been a criticism from NatureScot. NatureScot confirmed that the comments in the objection letter related to advice regarding micro-siting infrastructure outwith montane heath, it was not part of the objection in terms of national interest as this related to impacts on blanket bog/priority peatland habitat.	The latest surveys presented in **Technical Appendix 4.2** had now identified this vegetation community, helping inform a sensitive design layout and minimise impacts as far as possible depending upon impacts on other

Consultee and Date	Issue Raised	Response/Action Taken
		constraints. On this basis, montane heath is not taken forward for further assessment.
	In terms of scale of restoration NatureScot said they would be looking for a sizable area of restoration, which would be dependent upon the merits of the project.	Peatland restoration proposals are outlined within the **Technical Appendix 4.5 – OHMP**.
	NatureScot stated that deer management issues were coming through with Peatland Action restoration projects due to the high deer densities and ability to manage deer numbers. Land management would be a very necessary part of restoration/HMP proposals.	Deer management proposals are outlined within the **Technical Appendix 4.6 – DMP**.
	NatureScot stated that they were not too concerned about the extent of area to either side of the infrastructure, this could be 10m, or 30m or somewhere in between, provided it was applied consistently across the site.	A 10 metre buffer zone has been used for the calculation of the area of indirect impacts from the 29 Turbine Proposed Development on those habitats that will be affected by changes in hydrology. This is mostly applicable to the blanket bog habitat.

Legislation, Policy and Guidance

4.2.6 The Legislation and Policy Context considered in the assessment of effects on ecological features is unchanged from the EIA Report (April 2020) Chapter 8.

4.2.7 Technical guidance used to define the survey methods and inform this assessment are referenced in **Technical Appendix 4.2**.

Methodology

Field Surveys

4.2.8 The vegetation within a 50m buffer zone around the proposed infrastructure was mapped by ecologists in early July 2021. A total of 166 sample plots (4m^2 quadrats) of the vegetation were taken at the locations for the proposed wind turbines and at 150m intervals along the route of the proposed tracks to characterise the vegetation. All species of plant, including mosses, easily identifiable liverworts and macrolichens were identified and the abundance of the four most abundant species assessed. These sample quadrats were grouped using a multivariate statistical program (TWINSPAN). The similarity of these groupings or clusters to the National Vegetation Classification was carried out using the Tablefit and MAVIS programs.

4.2.9 The condition of the blanket bog habitat was assessed using the Common Standards Monitoring (CSM) guidance for upland habitats (JNCC 2009). A method devised by Penny Anderson Associates (PAA) was also used to assess the likelihood that the blanket bog habitat was accumulating peat. In addition to these the presence or absence of an acrotelm in each quadrat was noted as well as whether the peat was more (deep peat) or less (shallow peat) than 50 cm thick.

4.2.10 The location of notable species of bog-moss, rusty bog-moss (*Sphagnum fuscum*) and Austin's bog-moss (*S. austinii*), and bushes of dwarf birch (*Betula nana*) was recorded whilst walking between sample plots and survey areas.

4.2.11 Full details relating to survey methods and results are provided in **Technical Appendix 4.2** and accompanying figures.

Scoping Methodology

Determining Importance of Ecological Features

4.2.12 The method for determining the scope of the assessment corresponds with topic specific guidance (i.e. CIEEM, 2018). The relevant receptors, IEFs, the spatial and the temporal scope are all defined in this section. The methodology followed has multiple stages, enabling the scope of the assessment to be progressively refined.

4.2.13 For this ecological assessment the first stage in determining the scope of the assessment is to identify which ecological features identified through the desk study and field surveys (**Technical Appendix 4.2**) are 'important'[2] in the context of the 29 Turbine Proposed Development. Following CIEEM (2019) guidance, the importance of ecological features is first determined with reference to UK legislation and policy and then with regard to the

[2] Importance relates to the quality and extent of designated sites and habitats, habitat/species rarity and its rate of decline. Ecological features that are not considered to be important are those that are sufficiently widespread, unthreatened and resilient and with populations that will remain viable and sustainable irrespective of the Proposed Development.

extent of habitat or size of population that may be affected by the 29 Turbine Proposed Development.

4.2.14 As the importance of ecological features is determined with regard to the extent of habitat or size of population that may be affected by the 29 Turbine Proposed Development, the level of importance can differ from that which would be conferred by legislative protection or identification as a conservation notable species and from one development to another. For example, water vole is important at a national level because it is a Scottish Biodiversity List (SBL) species and has experienced a population decline of more than 25% in the last 25 years. However, a small population that could be affected by a development would be assessed as being of less than national importance if there is alternative well-connected and suitable habitat nearby that has the capacity to support individuals that may be displaced.

4.2.15 Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the categorisation described in **Table 4.2** to determine importance for the purposes of this assessment. Where detailed criteria or contextual data are not available, professional judgement was used to determine the level of importance.

4.2.16 An explanation of all determinations of importance are then provided in **Table 4.6** (for scoped in ecological features).

Table 4.2: Importance of the Proposed Development for Ecological Features

Geographic Context of Importance	Example / Description
International or European	1. European sites including SACs, candidate SACs and Sites of Community Importance (SCI), Special Protection Areas (SPAs), potential SPAs (pSPA) and possible SACs (pSACs) should also be considered in the same manner in accordance with National Planning Policy. 2. Areas of habitat or populations of species which meet the published selection criteria based on discussions with NatureScot and field data collected to inform the EcIA for designation as a European site or Ramsar site, but which are not themselves currently designated at this level.
National	1. A nationally designated site including SSSIs and National Nature Reserves (NNRs). 2. Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected, and in agreement with NatureScot. 3. Scottish Biodiversity List (SBL) habitats and species, and legally protected species that are not addressed directly in Part 2 of the "Guidelines for Selection of Biological SSSIs" but can be determined to be of national importance using the principles described in Part 1 of the guidance. 4. Large areas of priority habitats listed on Annex 1 of the Habitats Directive and smaller areas that are essential to maintain the viability of that ecological resource. 5. Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory.

Geographic Context of Importance	Example / Description
Regional	1. Regionally occurring populations of SBL species will be considered to be of regional importance in the context of published information on population size and distribution. 2. Large areas of modified or degraded priority habitats, which are important in a regional context.
County	1. Local Nature Reserves and Non-statutory designated sites. 2. Areas which based on field data collected to inform the EcIA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.
Local	1. SBL habitats and species and legally protected species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above. 2. Common and widespread semi-natural habitats occurring in proportions greater than may be expected in the local context. 3. Common and widespread native species occurring in numbers greater than may be expected in the local context.
Negligible	1. Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area. 2. Areas of heavily modified or managed land uses (e.g. hardstanding used for car parking, as roads etc.)

4.2.17 Where protected species are present and there is the potential for a breach of the legislation, those species should always be considered as 'important' features. With the exception of such species receiving specific legal protection, or those subject to legal control (e.g. invasive species), all ecological features that were determined to be of negligible importance have been scoped out of the assessment at this stage.

4.2.18 Furthermore, ecological features of local importance were also scoped out at this stage where there was a specific technical justification to do so. This is because effects on them would not influence the decision-making about whether or not consent should be granted for the 29 Turbine Proposed Development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM 2019.

Spatial Scope

4.2.19 The construction and operational phases of the 29 Turbine Proposed Development may result in the following direct and indirect environmental changes that could significantly affect ecological features:

- Direct habitat loss: permanent and temporary habitat loss during construction and operational phases due to land-take as a result of the 29 Turbine Proposed Development; and land management may change as a result (including mitigation/enhancement measures);
- Indirect habitat loss: disturbance/displacement to protected or notable species from habitat they would otherwise use for nesting, foraging, commuting, sheltering or roosting because of works activities during construction or by associated maintenance activities during operation;

- Habitat modification as a result of changes to the surface hydrology during construction and operation;
- Noise, vibration and movement of machinery and operations during the construction phase; and noise and movement of turbines during operation;
- Pollution associated with accidental spillage of fuels, oils, run-off and dust emission i.e. via direct contact, air or water; and
- Criminal offences: Potential disturbance or harm to nationally or European protected species (EPS), which could potentially lead to commission of criminal offence(s).

4.2.20 The key to establishing which environmental changes may result in likely significant effects, is the determination of a Zone of Influence (ZoI) for each IEF identified. ZoIs differ depending on the type of environmental change (i.e. the change from the existing baseline) as a result of the 29 Turbine Proposed Development and the ecological feature being considered.

4.2.21 The most straightforward ZoI to define is the area affected by land-take and direct landcover changes associated with the 29 Turbine Proposed Development. This ZoI is the same for all affected ecological features.

4.2.22 By contrast, for each environmental change that can extend beyond the area affected by land-take and land-cover change (e.g. increased noise associated with construction activities within the land-take area), the ZoI may vary between ecological features, dependent upon their sensitivity to the change and the precise nature of the change. For example, a water vole might only be disturbed by noise generated close to its burrow, while other species (e.g. many invertebrates) may be unaffected by changes in noise. In view of these complexities, the definition of the ZoI that extends beyond the land-take area was based upon professional judgement informed (as far as possible) by a review of published evidence (e.g. disturbance criteria for various species) and discussions with the technical specialists who are working on other related assessments.

4.2.23 It should be noted that the avoidance of potentially significant effects through the design process is implicitly taken into account through the consideration of each ZoI, as are standard construction practices that are common-place. When scoping in or out ecological features from further assessment, embedded mitigation measures (see Table 4.8) associated with general good practice that are described within the Code of Practice for planning and development (BSI, 2013) and Good Practice during Wind Farm Construction (Scottish Renewables et al., 2019) would be taken into account (e.g. dust suppression, appropriately scheduled vegetation removal etc.).

Temporal Scope

4.2.24 The temporal scope of the ecological assessment is consistent with the period over which the 29 Turbine Proposed Development would be carried out and therefore covers a.) construction; b.) operation; and c.) decommissioning periods (as outlined in Chapter 3: Description of Development of the EIA Report (April 2020)).

- Construction of the 29 Turbine Proposed Development is anticipated to be completed over a period of approximately 24-36 months;
- Operation of the 29 Turbine Proposed Development is anticipated to be operational for 50 years;
- Decommissioning would be anticipated to take approximately 12 months; and

- The environmental changes identified in Section 4.2.22 could occur during the construction phase and operational phase of the 29 Turbine Proposed Development. The effects of the environmental changes are considered with respect to their duration, frequency, timing and reversibility for each of the scoped in ecological features in **Table 4.6**.

Assessment Methodology

Introduction

4.2.25 The approach that has been used in this ecological assessment aligns to the standard industry guidance provided by CIEEM (2019). The assessment has been based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.

4.2.26 For each scoped-in IEF (in this case, 'bog habitats') (see **Table 4.6**), potential effects were assessed against the current baseline conditions for that feature during construction, operation and decommissioning.

4.2.27 Throughout the assessment process, the initial results of the assessment regarding potentially significant effects have been used to inform whether additional baseline data collection is required, together with the identification of industry standard mitigation measures that should be embedded into the 29 Turbine Proposed Development to avoid or reduce adverse effects or to deliver enhancements. The results of the assessment as set out in Section 4.5, therefore reflect the final scheme design (i.e. incorporating the mitigation by design and embedded mitigation measures described in Section 4.4 and **Table 4.7**).

4.2.28 The spatial extent of the assessment reflects the area occupied by the ecological feature that is being assessed and, as a minimum, the ZoI of the changes that may affect it.

4.2.29 Where part of a designated site is located within the ecological ZoI relating to a particular biophysical change as a result of the 29 Turbine Proposed Development, an assessment has been made of the effects on the designated site as a whole. A similar approach has been taken for areas of notable habitat.

4.2.30 For species that occur within the ZoI, the assessment has considered the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or commuting) rather than the footprint of the Site.

Significance Evaluation Methodology

Overview

4.2.31 CIEEM (2019) defines a significant effect as one "that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general". When considering potentially significant effects on ecological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account:

- Extent - the spatial or geographical area over which the environmental change may
- occur;
- Magnitude - the size, amount, intensity or volume of the environmental change;

- Duration - the length of time over which the environmental change may occur;
- Frequency - the number of times the environmental change may occur;
- Timing - the periods of the day/year etc. during which an environmental change may occur; and
- Reversibility - whether the environmental change can be reversed through restoration actions.

Magnitude of Change

4.2.32 A scale for the magnitude of the environmental change as a result of the Proposed Development has been described in **Table 4.3** to provide an understanding of the relative change from the baseline position, be that an adverse or beneficial change.

Table 4.3: Guidelines for the Assessment of the Scale of Magnitude

Scale of Change	Criteria and Resultant Effect
High	The change permanently (or over the long-term) affects the conservation status of a habitat/species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area e.g. Natural Heritage Zone (NHZ) and relative to the wider habitat resource/species population, a large area of habitat or large proportion of the wider species population is affected (e.g. ≥50 % of population/habitat affected). For designated sites, integrity is compromised. There may be a change in the level of importance of the receptor in the context of the project ZoI.
Medium	The change permanently (or over the long-term) affects the conservation status of a habitat/species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource/species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected (e.g. 10-49 % of population/habitat affected). There may be a change in the level of importance of this receptor in the context of the project ZoI.
Low	The quality or extent of designated sites or habitats or the sizes of species' populations experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability (e.g. 1-9 % of population/habitat affected). and they are not expected to result in any permanent change in the conservation status of the species/habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in term of its importance in the context of the project ZoI.
Negligible	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/species receptors or the integrity of designated sites.
Neutral	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations.

Determining Significance - Adverse and Beneficial Effects

4.2.33 Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Development. Beneficial effects are assessed as those where a resulting change from baseline improves the quality

of the environment (e.g. increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of "*high*" as described in **Table 4.3**.

4.2.34 Conservation status is defined as follows (as per CIEEM, 2019):

"*For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area*"; and

"*For species, 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*".

4.2.35 SNH (2018a) detail that a species' conservation status is favourable when:

- Population dynamics indicate that the species is maintaining itself on a long-term basis and is therefore likely to persist in the habitat it occupies;
- The natural range of the species is not being reduced, nor is likely to be reduced for the foreseeable future; and
- There is (and will probably continue to be) a sufficiently large habitat to maintain its populations on a long-term basis.

4.2.36 SNH (2018a) recommends that the concept of maintaining a favourable conservation status of a species should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern. This is a test which makes good ecological sense and maintains compatibility with the aims of National legislation and Government policy.

4.2.37 Nonetheless, developments should be assessed, alone or in combination, at a regional (or analogous scale) for their impacts on a species population size, trend and range. An adverse impact on a species at a regional scale (within Scotland) may adversely affect its national conservation status (for example where a specific region holds the majority of the national population).

4.2.38 The decision as to whether the conservation status of an ecological feature would alter has been made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each feature is likely to be affected by the Proposed Development.

4.2.39 A similar procedure is used where designated sites may be affected by the Proposed Development, except that the focus is on the effects on the integrity of each site; defined as:

"The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".

4.2.40 The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the site has been designated. Where these features are not clearly defined, which is often the case for non-statutory biodiversity sites, it is necessary to use professional judgement to identify the interest features or obtain additional information about the interest features from NatureScot, Scottish

Wildlife Trust or the local planning authority responsible for identifying these sites, so that sufficient information on which to base an assessment is available.

4.3 Baseline

4.3.1 The following description of the ecological features provides a summary of the ecology baseline as determined through desk study and field survey. Detailed descriptions of the desk study and field survey results are provided in **Technical Appendix 4.2**.

Desk Study and Historical Field Surveys

Vegetation Surveys

4.3.2 Field survey work conducted to inform the Cloiche Wind Farm EIA Report (April 2020) identified that the Study Area was comprised predominantly of blanket bog, wet modified bog and wet heath. Running water habitat was also present in the Study Area, including the Allt Mor, Allt Creag Chomaich and River Tarff. No trees were found to occur in the study area where work would take place. No invasive non-native plant species were recorded during surveys.

Field Surveys

4.3.3 Full details of the results of the field surveys undertaken for the 29 Turbine Proposed Development are provided in **Technical Appendix 4.2**.

4.3.4 The dominant habitats present in the study area are dry modified blanket bog, wet heath and wet modified blanket bog, with a lesser extent of montane heath, acid dry heath, marshy grassland and acid grassland, open water and bare and disturbed ground as shown on Figure 13 of **Technical Appendix 4.2** (including target notes, which are also described in Table 23, **Technical Appendix 4.2**). Photographs taken during surveys are also provided in **Technical Appendix 4.2**. All potentially sensitive habitats recorded in the study area are detailed in **Table 4.4**.

Table 4.4: Habitat types within the Study Area

Habitat type	Areas within site boundary (Ha)
Dry modified Blanket Bog	745.0
Wet modified Blanket Bog	153.5
Wet heath	523.1
Marshy grassland	83.1
Montane heath	62.7
Bare and disturbed ground (peat and rocks)	51.4
Acid flush	6
Acid grassland	3.9
Open water (standing and flowing)	2.8
Neutral flush	0.04
Calcareous	0.02
Total	**1,631.56**

GWDTE

4.3.5 Five flushes were found during the survey and these are shown in the Habitat and Vegetation Survey (Figure 6 - **Technical Appendix 4.2**) along with the areas of M6 vegetation types. The M32 and M10 flushes are highly dependent on ground-waters for their maintenance. The M10a flush was found in the western part of the survey area on the northern slopes of Carn nan Caorach. Two other flushes were apparently borderline between M31 and M10 and were in the same area. The M32 flushes were found in the eastern part of the site between Caochan Uchdach and Allt Mòr (Figure 6 of **Technical Appendix 4.2**).

4.3.6 As mentioned above, the M6 type of mire was mostly found along many of the stream valleys intermixed with areas of U5 grassland and M20 vegetation. In these situations, the grasslands are in the flood-plain of the streams. For most of the time their water supply will be coming from surface waters draining off the surrounding peatlands on to the peaty-mineral substratum that these types of mire and grassland communities are growing in. During storm events they are likely to be inundated by the streams over-flowing their banks.

4.3.7 A summary of NVC communities within the Study Area that may indicate the presence of GWDTE is provided in **Table 4.5**. A full description of this assessment and the GWDTEs is provided in **Chapter 6: Hydrology and Hydrogeology**.

Table 4.5: Vegetation Communities Recorded On-Site

NVC Community	Potential Groundwater Dependency (SEPA, 2017)
M6 - *Carex echinata - Sphagnum recurva/auriculatum* mire	High
M10 - *Carex dioica - Pinguicula vulgaris* mire *Pinguiculo-Caricetum dioicae*	High
M31 - *Anthelia judacea - Sphagnum auriculatum* spring *Sphagno auriculati-Anthelietum judaceae*	High
M32 - *Philonotis fontana - Saxifraga stellaris* spring *Philonoto-Saxifragetum stellaris*	High

4.3.8 Although the M6 vegetation is considered to be indicative of a wetland ecosystem highly dependent on ground-waters, the hydro-ecological setting of the river valley situations suggests otherwise. In this situation the M6 vegetation is in a topogenous mire rather than a soligenous mire and is therefore not dependent on ground-waters, but on surface waters.

Habitat and vegetation survey and condition assessment of blanket bog and montane heath habitats

4.3.9 The majority of the dry modified blanket bog in the survey area was of the heather – hare's-tail cotton-grass bog community (M19). As a good deal of this is on shallow peat, it has been classed as wet heath rather than blanket bog habitat. There were also extensive areas of vegetation that occurred on both deep and shallow peat that could be classed as either the reindeer lichen (*Cladonia spp*.) sub-community of the deer-grass – hare's-tail cotton-grass (*Trichophorum germanicum – Eriophorum vagninatum*) blanket mire community or the reindeer lichen sub-community of the deer-grass – cross-leaved heath (*Erica tetralix*) wet heath community. Much of this vegetation was classed as wet heath habitat.

4.3.10 The area of bog habitat within the 50m buffer zone around all the proposed infrastructure was calculated to be 35%, whilst it composed about 61% of the area outside this, but within the site boundary. In contrast wet heath composed about 50% of the area within the 50m buffer zone and 27% of the area outside this, but within the rsite boundary.

4.3.11 All of the blanket bog habitat failed at least one of the CSM targets and consequently it should be regarded as in unfavourable nature conservation condition. The level of peat erosion was the main reason for its failures, but high levels of browsing on heather was also frequent. Whilst walking between sample plots along the route of the proposed wind farm track, erosion features (gullies or haggs) were found to be present on average every 50 metres. As the drying out effect of these features can be expected to extend up to 15 metres either side, as estimated by NatureScot (2019), over half of the blanket bog has been and continues to be dried out by the erosion. The cover of bog-moss was also found to be low, i.e. less than 25%, in 92% of the 166 quadrats.

4.3.12 The mean weighted cover of bare peat in the sample plots on deep peat was 17% whilst the same statistic for shallow peat was 13%.

4.3.13 Despite the level of erosion rusty bog-moss was found to be relatively frequent, and occurred on the edge of erosion features as well in areas of intact bog habitat. Austin's bog-moss was found at three locations. Bushes of dwarf birch were found at a total of 7 locations, most of which were not on blanket bog habitat.

4.3.14 The montane heath habitat only makes up 8.7 hectares (2.4%) of the area within the 50 m buffer zone around the proposed development, whilst it makes up about 63 hectares, or 3.8% of the total area within the site boundary (Table 15 – **Technical Appendix 4.2**). Figure 5 (**Technical Appendix 4.2**) shows the location of the H13 montane heath community and it shows that most of the montane heath is on Meall Caca and small mounds in the south of the survey area to the east of Lochan Iain.

SSSI selection criteria for blanket bog

4.3.15 Commentary on NatureScot's objection to the 36 Turbine Scheme in relation to the Priority Peatland habitats at the site is presented in **Technical Appendix 4.1**. Consideration of National Interest and SSSI selection criteria in respect to blanket bogs is addressed.

4.3.16 Based on Table 2 - Consideration of the 'Site Visit Template' (**Technical Appendix 4.1**), it is clear that, when considered in detail, the only SSSI selection criteria that the 'bog' habitat at the site clearly met, was that it extended beyond 25ha in size. Beyond that criterion:

- The bog was not normally capable of forming peat;
- Although there was a low number of drains/peat cutting, there was extensive erosion features that act as drains;
- There was not a high frequency of peat forming species or an indication of a lack of disturbance;
- There was not a natural surface pattern; and
- Although there was no invasion of woodland or scrub species, this would not be expected on such a site and is invalid.

4.3.17 There were however hummocks of rusty bog-moss and Austin's bog-moss. These species are not considered rare in Scotland and are not on the SBL. While in some ecological

context they may be present in undisturbed habitats, this is not the case at the site, as they are clearly in a disturbed setting of heavy erosion and grazing.

4.3.18 One of the SSSI selection criteria, according to JNCC (1994), is "*Blanket bog is a type which should be represented by the selection of exemplary sites showing the full range of ecological variation*". This SSSI selection criteria was not considered by NatureScot. The heavily eroded and degraded site is a long way from being exemplary and requires significant peatland restoration to become a functioning bog.

4.3.19 Based on this evidence it is clear that the bog habitat within the site does not meet the SSSI selection criteria for blanket bog and therefore cannot be considered to be of "*the highest quality*" or of National Interest.

Summary of Important Ecological Features

4.3.20 Ecological features that are scoped into the assessment (i.e. those of sufficient importance occurring within a relevant ZoI) are summarised in **Table 4.6**, along with a summary of the explanation behind their inclusion.

Table 4.6: Likely Effects, Zone of Influence and Justification for Scoped in Important Ecological Features

Ecological Feature	Importance – Legislation and Policy	Importance - Site	Environmental changes and likely significant changes	Zone of influence	Relevant assessment criteria and scoped in justification
Blanket bog	National	Regional	Direct loss and temporary damage to terrestrial habitats	Within the construction/ maintenance areas	Blanket bog communities are a restricted and declining habitat in the UK and Europe. Blanket bog is a SBL Priority habitat and includes habitats / vegetation communities listed in the Habitats Regulations. Based on the evidence presented in **Technical Appendix 4.1** and **Technical Appendix 4.2**, it is clear that the bog habitat within the site does not meet the SSSI selection criteria for blanket bog and therefore cannot be considered to be of "the highest quality" or of National Interest.
			Indirect disturbance and changes to composition of plant communities resulting from hydrological change	10m beyond construction/ maintenance areas	

4.4 Mitigation Embedded into the Development Proposals

Mitigation by Design

4.4.1 An iterative design process has been carried out and a range of mitigation measures have been embedded into the 29 Turbine Proposed Development, as outlined in **Chapter 2: Revision to the Proposed Development**; and **Chapter 14: Schedule of Mitigation**.

Land take and Design Optimisation

4.4.2 Ecological features have been considered at all stages of the design, from early feasibility to final layout. This has helped to avoid or greatly reduce impacts on IEFs and other ecological features. The revised design of the 29 Turbine Proposed Development now predicts a much smaller predicted total loss/modification of bog habitat of 43.04 ha, reducing the overall impact on bog habitats by over 50%.

4.4.3 The layout of the 29 Turbine Proposed Development is in areas which have generally shallower peat and for the most part avoids the areas of deeper peat. This process has been informed by the habitat and vegetation survey and condition assessment of blanket bog and montane heath habitats (**Technical Appendix 4.2**), with preference for development avoiding blanket bog and montane heath or in areas broadly categorised as modified/drained or actively eroding, and upon areas of shallower peat.

4.4.4 Site infrastructure has been designed as far as reasonably practicable to use the minimum land take. For instance, all access track has been designed to be linear, without loops, to avoid creating islands of habitat fragmentation.

4.4.5 The proposed borrow pit search areas, the substation, temporary construction compound and storage/laydown areas have been sited to avoid sensitive vegetation communities.

4.4.6 Where avoidance of development in areas of blanket bog has not been possible, the locations have been selected to avoid areas of deep peat, where possible, as detailed in **Chapter 7: Geology and Carbon Balance** and associated appendices. Where peat depth is >1m, track construction would generally be of a floating design where practicable rather than a cut design, in order to minimise the disturbance to peat. It is anticipated that approximately 2.2km of floating track design would be utilised for the 29 Turbine Proposed Development. The track design would have due regard to key principles set out in the joint SNH and Forestry Commission Scotland (FCS) guide to floating roads on peat (SNH *et al*., 2010). Measures already taken into account during design include track micro-siting to avoid deep peat, and where required, features would be incorporated into the track, such as hydrological culverts to minimise the potential effects on the hydrological characteristics of blanket bog and wet heath habitat. Further details of hydrological mitigation to reduce the significance of potential adverse effects on the hydrology are described in **Chapter 6: Hydrology and Hydrogeology**.

4.4.7 Another key design consideration has been the avoidance of habitats with potential groundwater dependency, which has been largely achieved by siting the majority of the development outwith habitats that a potential dependency on groundwater (GWDTEs) and making use of existing tracks associated with the operational Stronelairg Wind Farm.

4.4.8 **Table 4.7** outlines how embedded mitigation measures (project assumptions) implemented during construction and operational phases of the 29 Turbine Proposed Development would influence the ecological assessment.

Table 4.7: Summary of Embedded Mitigation Measures

Important Ecological Feature	Change and Effects	Embedded Mitigation Measures and Influence on Assessment
Blanket bog	Direct habitat loss and temporary disturbance during construction	The following measures would be incorporated in order to minimise construction effects to blanket bog and other sensitive terrestrial habitats: • Site supervision would be provided by a suitably experienced Environmental Clerk of Works (ECoW), who would be responsible for ensuring the successful implementation of embedded measures, including pollution prevention (see below), monitoring of buffers around construction areas and reference to areas of high ecological sensitivity, and adherence to current construction good practice; • Micro-siting (up to 50 m) could be used to relocate infrastructure to further avoid any sensitive habitats identified at the point of construction. This would be carried out on the ground under supervision by the ECoW. Micro-siting would seek to avoid, or minimise impacts as far as possible on ecological features such as: • Dwarf birch and Austin's bog-moss; • Bog pools; • M32 and M10 flushes that were found during surveys and those identified in the survey in 2019; and • Other potential GWDTEs. • The ECoW will provide advice to minimise preventable impacts on blanket bog habitats, including preservation of the topsoil/ acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a local seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present. • Pre-construction surveys of all works areas over blanket bog would be undertaken by a suitably qualified ECoW to identify locations of any rare bog species (notably dwarf birch, rusty bog-moss or Austin's bog-moss) and propose suitable avoidance buffers, or consideration of translocation elsewhere within the Site as necessary; • As part of an overarching CEMP, a Peat Management Plan would be developed and submitted pursuant to an anticipated condition of the deemed planning permission, in consultation with a suitably experienced peatland Ecologist, Hydrologist and the relevant consultees, in advance of construction works commencing. This would include the method of removal and storage for vegetated turves and peat together with good practice reinstatement measures for the re-use of excavated peat within the Site; • Best practice techniques of vegetation and habitat reinstatement would be adopted and implemented in areas of disturbed vegetation, such as cut track sides, cranepads, substation and borrow pits. Early reinstatement of all

Important Ecological Feature	Change and Effects	Embedded Mitigation Measures and Influence on Assessment
		disturbed areas would be undertaken to minimise the effects of soils and peat exposure erosion. Any plant material used in reinstatement techniques would be of local provenance and be appropriate for locations being restored. Lessons learned from habitat reinstatement at other SSE upland wind farm sites, e.g. Stronelairg, Fairburn, Dunmaglass, and Gordonbush would be used to inform suggested approaches and increase the likelihood of success. Reinstatement techniques would be agreed in consultation with relevant consultees before construction operations begin; and • An Outline Habitat Management Plan (OHMP) (**Technical Appendix 4.5**) would be implemented with the aim of ensuring successful restoration of affected blanket bog within candidate Habitat Management Units (HMUs) on and off-site. The HMP would be submitted pursuant to a condition of the deemed planning permission, following consultation with NatureScot and SEPA.

4.5 Potential Effects

4.5.1 This section considers the potential impacts and associated effect significance of the construction, operation and decommissioning of the 29 Turbine Proposed Development based on the typical activities described in Chapter 3: Description of Development of the EIA Report (April 2020).

Construction Effects

4.5.2 The assessment of likely effects associated with the construction of the 29 Turbine Proposed Development is based on the activities described in Chapter 3: Description of Development of the EIA Report (April 2020).

Habitat loss

4.5.3 Construction activities have the potential to degrade or destroy terrestrial habitat either directly through excavation, compaction, or modification (e.g. vegetation removal) or indirectly as a result of dewatering or from the accidental release of fuels, lubricants or other chemicals. The construction of 29 turbine foundations and hardstanding areas, access tracks, a substation and LiDAR unit would cause permanent habitat loss. The construction of new temporary development areas (two site establishment areas, concrete batching plant(s) and eight borrow pits) and the laying of cables between turbines would cause temporary habitat degradation or loss in the short- to medium-term until habitats are reinstated following completion of the 29 Turbine Proposed Development. Two borrow pits and a site compound occur on areas previously used for the construction of Stronelairg Wind Farm. The significance of these effects per habitat type is considered below.

4.5.4 **Figure 4.1** shows the 29 Turbine Proposed Development overlaid on the habitats mapped using the Phase 1 habitat survey methodology.

4.5.5 **Table 4.8** and **Table 4.9** set out the percentage of direct and indirect habitat loss by habitat type within the Study Area, respectively.

- Direct impacts from tracks were based on a width of 6.5m. Although floating tracks are narrower, by 1m, the impacts from embankments and cuttings elsewhere are unlikely to be totally compensated for by the over estimation of the width of floating tracks;
- Indirect habitat modification is calculated as a 10m buffer around the areas of direct habitat loss as this is considered to represent the worst-case scenario of habitat that is likely to be indirectly modified by the 29 Turbine Proposed Development; and
- The area (3.536ha) assigned for the construction compound is on disturbed ground that has ephemeral and short perennial type vegetation with some affinity to acid grassland. The 10m buffer around this amounts to 0.731ha and has the same type of habitat and vegetation.

4.5.6 As well as direct habitat losses, areas have been identified where temporary habitat loss would be expected during construction, including the construction compound and borrow pits. These areas would be subject to restoration as detailed in the outline CEMP.

4.5.7 Habitat losses are broken down by Phase 1 habitat types in **Table 4.8** and **Table 4.9**; and by NVC communities in **Appendix 4.3: Habitat Loss Calculations**.

Table 4.8: Permanent Habitat Loss from Proposed Development During Construction

		Direct habitat loss		Indirect habitat modification	
Habitat	**Total habitat in Study Area**	**Area lost (Ha)**	**Percentage Loss (%)**	**Area Modified (Ha)**	**Percentage modified (%)**
Wet heath	523.1	13.38	2.56	21.47	4.1
Dry modified bog	745	8.21	1.1	14.72	1.98
Wet modified bog	153.5	3.99	2.6	7.03	4.58
Montane heath	62.7	0.33	0.53	0.29	0.46
Other habitats that were impacted –acid grassland, marshy grassland, ephemeral/short perennial; bare ground)	147.26	4.47	3.04	7.02	4.77
Total area (ha)	**1631.56**	**30.37**	**1.86%**	**50.53**	**3.1%**

Table 4.9: Temporary Habitat Loss from Proposed Development During Construction

		Direct impacts		Indirect habitat modification	
Habitat	**Total habitat in Study Area**	**Area lost (Ha)**	**Percentage Loss (%)**	**Area Modified (Ha)**	**Percentage modified (%)**
Wet heath	523.1	4.87	0.9	1.7	0.3
Dry modified bog	745	4.97	0.7	1.68	0.2
Wet modified bog	153.5	2.03	1.3	0.4	0.3
Montane heath	62.7	0.13	0.2	0.13	0.2
Other habitats that were impacted – acid grassland, marshy grassland, ephemeral/short perennial; bare ground)	147.26	5.865	3.98	1.34	0.9
Total area (ha)	**1631.56**	**17.87**	**1.1**	**5.25**	**0.32**

4.5.8 It is clear that the majority of the habitat predicted lost as a result of the development footprint would be from wet heath and 'bog' habitats (**Table 4.8** and **Table 4.9**), with much smaller amounts of other habitats, including acid grassland, montane heath, marshy grassland and flush.

4.5.9 A total of fifteen turbine locations are located on blanket bog habitat, NVC communities M17a, M17b or M19 (six of these turbine locations are located on the edge of these vegetation communities, which transition into with wet heath communities) with a further three on wet heath/blanket bog (M15/M17).

4.5.10 A Peatland Condition Assessment (**Technical Appendix 4.2**) provides an additional approach for helping to determine peatland condition and therefore helping to avoid or reduce impacts to the

best quality blanket bog habitat. This approach considers presence of all peatland habitats including blanket bog, as well as wet heath and dry heath.

4.5.11 The widespread occurrence and high density of erosion gullies and peat haggs across the survey area suggests that all of the blanket bog is modified. As the drying out effect of these features can be expected to extend up to 15 metres either side, as estimated by NatureScot (2019), over half of the blanket bog has been and continues to be dried out by the erosion. The Phase 1 habitat survey uses the cover of bog-mosses as a method for separating modified from unmodified bog. The results of this survey suggests that the cover of bog-mosses is for the most part between 1 and 5% for the areas of deep peat that were sampled (Table 16 - **Technical Appendix 4.2**). The Phase 1 habitat manual places the M17 community in the unmodified type of blanket bog in its correspondence table (Appendix 8 - **Technical Appendix 4.2**). In fact, much of the apparent M17 vegetation at the site is on thin peat and/or eroding blanket bog.

4.5.12 The likelihood that the bog was active, possibly active, potentially active, or inactive was assessed using the method of PAA (See Appendix 2 - **Technical Appendix 4.2**). This showed that at 48 (62%) of the 77 blanket bog plots were inactive and 27 (35%) of the remaining 29 blanket bog plots were only 'potentially active' (Table 20 - Technical Appendix 4.2). Only at one of the 77 plots was the blanket bog habitat assessed to be active and one to be 'possibly active', as they scored 4 and 3, respectively on the scale devised by PAA. At one of the 89 quadrats on shallow peat the wet heath habitat was assessed as 'possibly active' (See Table 20 -Technical Appendix 4.2).

- The results of the assessment of the condition of the blanket bog habitat using the CSM guidance (JNCC 2009) showed that the blanket bog habitat is in poor condition as it failed at least one of the 13 targets at all 77 plots that were located on deep peat (See Table 19 - **Technical Appendix 4.2**);
- The majority of the plots failed two targets or more (See Table 19 - **Technical Appendix 4.2**).
- All plots failed on the extent of erosion exceeding re-deposition and/or re-vegetation of bare peat, whilst the browsing of heather was above the trigger threshold at nearly two-thirds of the plots (See Table 19 - **Technical Appendix 4.2**);
- Other targets where the blanket bog failed include a lack of a sufficient cover of positive indicator species and number of positive indicator species (See Table 19 - **Technical Appendix 4.2**); and
- Despite some of the plots being in poor condition 44 (57%) of the 77 plots had some acrotelm present (See Table 21 - **Technical Appendix 4.2**). The acrotelm was not usually present across all of the 4m^2 plot and was typically restricted to where there was some Sphagnum. There is no obvious spatial distribution in the plots with or without an acrotelm (See Figure 11 - **Technical Appendix 4.2**).

4.5.13 Given the lack of surface water-logging features, and the conditions described, overall, it is considered that the blanket bog at the proposed turbine locations was likely to be largely inactive. Although, this does not preclude that limited peat formation may occur at some locations under some circumstances.

4.5.14 The blanket bog habitat within the Development Footprint did not meet the SSSI selection criteria and is not considered to be of the highest quality (**Technical Appendix 4.1**).

4.5.15 Micro-siting (50 m) could be used to relocate infrastructure to further avoid any sensitive habitats, such as bog pools. This would necessarily be carried out on the ground under supervision by the ECoW. The habitat surveys provided guidance in many areas of how to avoid the most sensitive,

blanket bog areas through design (which has already been done) and can be used to inform micro-siting (yet to be done). Embedded mitigation includes, where possible, preserving the topsoil/acrotelm from the habitat that is lost and laying it over the top of the areas to be reinstated (e.g. over the 'cut and fill'). This will provide a local seed source as well as viable root matter for the areas being reinstated. Therefore, the reinstated vegetation is likely to be similar, if not the same, habitat type as previously present.

4.5.16 **Table 4.10** provides the habitat loss (at construction, which is largest) as a proportion of the habitats within the Study Area scale, at the regional scale and at the Scottish scale for the key habitats in the Study Area. The Scottish metrics are from those reported by the JNCC (2015), the regional metrics used are those reported in the Caithness and Sutherland SAC Data Form (NatureScot, 2021). There is clearly much more blanket bog in the whole region, i.e. all the blanket bog that is not part of a designated site, but these metrics supply a known, authoritative, regional estimate in which to consider the impacts against.

Table 4.10: Summary of Predicted Blanket Bog Habitat Loss Parameters

Phase 1 Habitat	Proportional Study Area Loss and Magnitude	Proportional Regional Loss and Magnitude	Proportional National Loss and Magnitude
Dry modified bog	A total of 29.6 ha (22.9 ha + 6.7 ha) of dry modified bog, is predicted to be lost from the 29 Turbine Proposed Development out of the total 745 ha dry modified bog Study Area resource = 3.97 %. Magnitude = Low	A total of 29.6 ha of dry modified bog, is predicted to be lost from the 29 Turbine Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.03 %. Magnitude = Negligible	A total of 29.6 ha of dry modified bog is predicted to be lost from the 29 Turbine Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.002 %. Magnitude = Negligible
Wet modified bog	A total of 13.45 ha (11.02 ha + 2.43 ha) of wet modified bog, is predicted to be lost from the 29 TurbineProposed Development out of the total 153.5 ha wet modified bog Study Area resource = 8.76 %. Magnitude = Low	A total of 13.45 ha of wet modified bog, is predicted to be lost from the 29 Turbine Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.012 %. Magnitude = Negligible	A total of 13.34 ha of wet modified bog is predicted to be lost from the 29 Turbine Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.00076 %. Magnitude = Negligible
Combined blanket bog habitats	A total of 43.05 ha (29.6 ha + 13.45 ha) of wet modified bog, is predicted to be lost from the 29 Turbine Proposed Development out of the total 898.5 ha wet modified bog Study Area resource = 4.79 %. Magnitude = Low	A total of 42.94 ha of wet modified bog, is predicted to be lost from the 29 Turbine Proposed Development out of the available regional resource of blanket bog of 113,672 ha = 0.04 %. Magnitude = Negligible	A total of 42.94 ha of wet modified bog is predicted to be lost from the 29 Turbine Proposed Development out of the total blanket bog Scottish resource of 1,759,000 ha = 0.002 %. Magnitude = Negligible

4.5.17 The land-take assessment shown in **Table 4.10** is presented for the construction phase land-take. The construction loss includes a cut and fill buffer around all infrastructure including roads, turbine

bases, buildings and borrow pits to take account of additional habitat that may be lost/damaged during constructions. This is precautionary. The buffer around the infrastructure is unlikely to extend far for some/most of the infrastructure, but exactly how much and where is unclear. Buffers would avoid any areas considered more sensitive by an ECoW.

4.5.18 The habitat with the largest amount of predicted loss, the bog habitat (including dry modified blanket bog and wet modified bog) was assessed as being of regional importance and the magnitude of impact that would arise as a consequence of construction land-take was assessed as Low at the Study Area scale and negligible at the regional and national scale (**Table 4.10**).

4.5.19 The 36 Turbine Scheme also predicted bog habitats to have the largest land-take, with a predicted total loss/modification of ca. 87ha of 'bog' habitat. The revised design of the 29 Turbine Proposed Development predicts a much smaller predicted total loss/modification of bog habitat of 43.04ha, reducing the overall impact on bog habitats by over 50%.

4.5.20 The effects of the 29 Turbine Proposed Development could be further minimised through appropriate micro-siting of tracks etc, to avoid or minimise impacts upon specific locations with dwarf birch and Austin's bog-moss and the implementation of other good practice embedded mitigation (**Table 4.7**), including proposals for full habitat re-instatement of temporarily disturbed habitat and the re-use of excavated peat within the site (Details are provided in **Chapter 7** and **Technical Appendix 7.1 – Peat Management Plan**). This would be a Low magnitude of change affecting 4.79% of the blanket bog vegetation within the Study Area, which is assessed as being of Regional importance for this habitat. The impact caused by land-take of bog habitats is considered to be likely, one-off, irreversible and long-term and no likely significant effects are predicted (**Table 4.11**).

Indirect Impacts through Changes in Hydrology

4.5.21 The blanket bog habitat within the site boundary is in poor nature conservation condition due mainly to the levels of erosion. The drying effect has resulted in a lower than expected cover of bog-mosses that are required to maintain a good quality bog habitat that is self-sustaining. This extensive erosion means that the hydrological impact of the construction of the infrastructure is likely to be limited. This is because the hydrological units will be limited to the catchments of each erosion gully.

4.5.22 The assessment of local hydrology (**Chapter 6: Hydrology and Hydrogeology**) states that measures would be included to ensure that pre-development runoff rates are maintained and that rates of runoff to watercourses are not increased. Effects would be further minimised through the implementation of proposals (**Table 4.7**), including full habitat re-instatement or restoration of temporarily disturbed habitat and the re-use of excavated peat within the site (as detailed in **Chapter 14 – Schedule of Mitigation**). The 29 Turbine Proposed Development is therefore anticipated to cause temporary (short-term) change to the local hydrology regime (low magnitude), with likely short-term changes in the composition of blanket bog vegetation of Regional Importance up to ten metres from proposed infrastructure. Although the magnitude and duration of the impact would depend on the nature of the pollution event, based on a precautionary approach, it has been considered to result in an adverse effect at the local level but this effect is considered to be not significant, particularly as the effect would be localised to watercourse crossing areas, with most standing or running water habitat protected from construction activities by a 50m buffer.

Operational Effects

Habitats

4.5.23 Operation of the 29 Turbine Proposed Development is not anticipated to involve any works which will directly or indirectly impact blanket bog habitat. Habitat management works (See Section 4.6 and **Technical Appendix 4.5 - OHMP**) will take place on and off-site throughout the lifecycle of the 29 Turbine Proposed Development and will likely have a long-term positive impact on the blanket bog resource on site. In light of the above, no significant detrimental operational effects on blanket bog habitat are predicted. Although it is reasonable to anticipate that the successful implementation of the proposed measures would result in a positive operational effect. As the scale and success of these measures are yet to be determined, it is considered that the effects will, at a minimum, be neutral, and thus not significant.

Decommissioning Effects

Habitats

4.5.24 Decommissioning impacts would involve personnel and machinery accessing locations across the study area to dismantle and remove infrastructure, including turbines, hardstanding and site buildings, as detailed in Chapter 3: Description of Development of the EIA Report (April 2020). The wind turbines and substation would be removed to ground level, with the concrete turbine foundations left in-situ and broken down to approximately 1m below ground level. Substation foundations would also be removed. The access tracks and electrical cables would be left in-situ to minimise habitat disturbance. These impacts would be short-term, intermittent and temporary and last weeks or months at any given location. Existing access tracks would be used to access the infrastructure to be decommissioned. As a result, effects on habitats are predicted to be short term and temporary, with habitats allowed to recover and regenerate following the removal of infrastructure.

4.6 Enhancement and Biodiversity Net Gain

4.6.1 Given the unfavourable nature conservation condition of the blanket bog within the Study Area, and the importance of blanket bog and peatland habitats in regard to carbon storage and carbon sequestration and the current climate emergency, peatland restoration has been included in the OHMP (**Technical Appendix 4.5**). Peatland restoration will provide benefit to the habitat, the assemblage of species that depend upon it and for the associated ecosystem services benefits e.g. the carbon storage and downstream water quantity and quality. The OHMP sets out criteria for identifying and delivering ecological benefits to the blanket bog habitats within and outwith the Study Area. A core aim of the Cloiche Wind Farm habitat management proposals in respect to Ecological features considered in this chapter will be to help conserve, enhance and restore degraded or modified blanket bog habitats. The purpose of the plan is:

- At the earliest opportunity following commissioning of the windfarm, to restore and enhance c.150 ha of blanket bog habitat within on and off-site Habitat Management Units (HMUs), which include habitats within the Monadhliath SAC. Proposals will help encourage vegetation cover of the peatland and limit peat erosion and carbon loss. The peatland restoration may also allow areas of the peatland to become actively peat forming. Proposals will improve the quality and extent of blanket bog and offset habitat loss incurred as a result of the 29 Turbine

Proposed Development, as well as well as providing additional enhancement through improvements to the condition of blanket bog habitat within the SAC; and

- Work in conjunction with the Deer Management Plan (**Technical Appendix 4.6 - DMP**) to manage grazing/trampling pressures to ensure that blanket bog vegetation can re-establish on areas of bare peat through reduction of deer grazing pressure and improve the quality of blanket bog within the candidate HMUs and the wider area.

4.6.2 Informed by evidence outlined within **Technical Appendix 4.5 - OHMP**, three candidate HMUs have been identified as suitable for peatland restoration as illustrated in Figure 4.5.3 (**Technical Appendix 4.5 - OHMP**).

4.6.3 A total of 150ha of peatland restoration would be delivered, comprising:

- c. 65ha of peatland restoration within the HMU A (Glendoe Estate);
- c. 45ha of peatland restoration within HMU B (Garrogie Estate); and
- c. 40ha of peatland restoration within HMU C (Garrogie Estate).

4.6.4 The location of these areas would be subject to refinement prior to completion of a detailed HMP, but restoration would aim to restore the peatland/blanket bog habitat within the following HMUs.

Potential Effects of Enhancement Measures

4.6.5 Habitat restoration measures would focus on halting or reducing peatland erosion and re-wetting modified or degraded blanket bog, which would be likely to include: gully and lochan wall-blocking, reprofiling gully edges and peat haggs, peat pan restoration, peat-cored contour bunds, spot turfing and bare peat mulching with bog moss. These measures are considered highly suitable and appropriate for the site. The benefits of peatland restoration are widely recognised through landscape scale peatland restoration projects in the Monadhliath, which are being delivered across thirteen estates associated with the Monadhliath Deer Management Group (MDMG).

4.6.6 The areas intended for peatland restoration far exceed the area of predicted habitat loss - 43.04ha loss compared to c. 150ha peatland restoration within the proposed HMUs.

- Enhancement measures are considered beneficial;
- HMUs include on site and offsite areas, including parts of the internationally important peatlands of Monadhliath SAC/SSSI;
- The benefits to peatland habitats from peatland restoration and where necessary, reduced grazing, are likely to be very long-term, beyond the life-time of the Proposed Development;
- The benefits from these peatland restoration actions would be reversed if significant deer grazing pressure was likely to continue or increase;
- Peatland restoration such as gulley blocking, hagg reprofiling and peat pan restoration would be one off events. Reduction in grazing pressure will be ongoing/long-term; and
- The benefits from peatland restoration actions are certain. Many large-scale habitat restoration projects have been implemented (as discussed above) and the recovery of bogs documented. The effectiveness of best practice restoration techniques are developing rapidly are likely to increase in the future.

4.6.7 Consideration of the benefits to peatland restoration follow CIEEM EcIA guidelines and demonstrate that these enhancement measures would likely provide a moderate beneficial impact on the regionally blanket bog resource within the Study Area and beyond, within the nationally and

internationally important Monadhliath SAC/SSSI, which far outweigh the predicted minor predicted losses from land-take.

4.7 Cumulative Effects

4.7.1 The above sections have considered the effects of the 29 Turbine Proposed Development in isolation from other developments. There is no published NatureScot guidance for cumulative impact assessment on most ecological receptors (including blanket bog habitats). NatureScot's guidance on cumulative impact assessment of onshore wind farms is confined to landscape and birds. The key principle of NatureScot's cumulative impact assessment guidance for birds is to focus on any significant effects and in particular those that are likely to influence the outcome of the consenting process.

4.7.2 There are no likely significant effects for blanket bog habitats at the 29 Turbine Proposed Development. Therefore, no effect is likely to influence the outcome on the consenting process, alone or in combination with other developments. Consequently, no likely significant cumulative effects are predicted.

4.8 Residual Effects

4.8.1 This chapter has considered the potential effects on blanket bog habitats present at the site associated with the construction, operation and decommissioning of the 29 Turbine Proposed Development. With the implementation of proposed mitigation and enhancement measures, there are no likely significant residual adverse effects predicted for blanket bog habitats and so compensation is not necessary for the 29 Turbine Proposed Development.

4.9 Conclusion

4.9.1 This chapter has:

- Established the baseline ecological conditions of the site using a desk-study and targeted ecological surveys (Habitat and vegetation survey and condition assessment of blanket bog and montane heath habitats);
- Identified the extent of blanket bog habitats likely to be affected by the 29 Turbine Proposed Development;
- Assessed the ecological importance and sensitivity of blanket bog habitats;
- Evaluated the likely magnitude of predicted impact on blanket bog habitats from the construction and operation of the 29 Turbine Proposed Development; and
- Identified mitigation, including avoidance and minimisation of impacts on blanket bog habitats and has provided enhancement opportunities.

4.9.1 **Table 4.11** below summarises the significance of effect for blanket bog habitats and the residual significance.

Table 4.11: Summary of Effects

IEF	Description of Predicted Effect	Significance of Potential Effect		Mitigation or enhancement measures	Significance of Residual Effect	
		Likely Significance	Beneficial/ Adverse		Likely signficance?	Beneficial/ Adverse
Blanket bog habitats	Direct loss and temporary damage to terrestrial habitats	Not Significant	Adverse	E.g. avoidance and minimising impacts on the better quality blanket bog habitat within the Study Area. Preserving the topsoil/acrotelm, where possible, from habitat that is lost and laying it over the top of the areas to be reinstated (e.g. cut and fill areas). Peatland restoration work as outlined in the OHMP. The planned restoration work would involve restoring blanket bog in an area ca. 150 ha, which includes peatland restoration within the Monadliath SAC/SSSI.	Not Significant	Adverse/ beneficial
	Indirect disturbance and changes to composition of plant communities resulting from hydrological change	Not Significant	Adverse		Not Significant	Adverse/ beneficial

4.9.2 This assessment does not predict any likely significant ecological residual effects on blanket bog habitats associated with the 29 Turbine Proposed Development.

4.10 References

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5. Ornithology

5.1 Introduction

5.1.1 This Chapter provides an assessment of the potential effects of the 29 Turbine Proposed Development on bird species of conservation concern and their supporting habitats. This assessment is focused on reporting the implications of the changes to the 36 Turbine Scheme on the conclusions of the assessment described in the EIA Report (April 2020), with updates to that assessment highlighted where applicable. This Chapter does not reiterate, in any detail, the baseline information provided in the EIA Report (April 2020). No additional baseline survey data has been collected to inform this assessment. Relevant sections of Chapter 9 of the EIA Report (April 2020) and the supporting Technical Appendices are referenced as appropriate throughout. This Chapter should therefore be read in conjunction with Chapter 9 of the EIA Report (April 2020).

5.1.2 The figures presented with Chapter 9 of the EIA Report (April 2020) have been updated to show the 29 Turbine Proposed Development, and they accompany this Chapter and are listed in the table of contents page.

5.1.3 The potential for significant effects on sensitive ornithological receptors arising from the 29 Turbine Proposed Development in combination with other wind farm developments (existing and proposed) located within the Central Highlands Natural Heritage Zone (NHZ 10) has been reviewed and updated in this Chapter. This updates the cumulative impact assessment reported in the EIA Report (April 2020). The review has considered changes to proposed wind farm developments since information for the original assessment was collated in late 2019.

5.2 Site Context

5.2.1 The locations of the western and eastern clusters support a range of upland habitats including blanket bog, modified bog, acid grassland, acid flush, dry dwarf-shrub heath and various nutrient-poor lochs and lochans, including the artificial reservoir for Glendoe Hydroelectric Scheme. Allowing for a 500m buffer zone around the outermost proposed wind turbines the western cluster would occupy an area of approximately 1100ha, which ranges in elevation from 600m to 730m Above Ordnance Datum (AOD). The eastern cluster would occupy an area of approximately 419ha, ranging in elevation from 680m to 750m AOD.

5.2.2 There are no statutory or non-statutory natural heritage designations within the boundary of the 29 Turbine Proposed Development (e.g. Sites of Special Scientific Interest (SSSIs) or Special Protection Areas (SPAs), see **Figure 5.1**). Approximately 100m to the east of the eastern cluster is the boundary of the Monadhliath SSSI and Special Area of Conservation (SAC). This area designated at a European level for blanket bog habitats and at a national level for the aggregations of upland breeding birds that the site supports, including dotterel, golden plover and dunlin. All other designated sites with ornithological interest present in the surrounding area (i.e. within c. 20km), such as Loch Knockie and Nearby Lochs SPA, were scoped out of the original assessment as no adverse effects on their associated populations were predicted. This remains the case for the 29 Turbine Proposed Development.

5.3 Methods Summary

5.3.1 The assessment follows the methods as set out in the EIA Report (April 2020) (see Section 9.5 of Chapter 9). It focuses on reviewing the potentially significant effects of the 29 Turbine Proposed Development on key bird receptors (i.e. bird populations of conservation concern and sensitivity to

wind farm development and their supporting habitats). What is considered a 'significant' impact, in terms of the EIA Regulations, is determined following a standardised process, informed by professional judgement.

5.3.2 In summary, the 29 Turbine Proposed Development has the potential to adversely affect birds through the following impacts:

- Noise and visual disturbance during construction, operation and site decommissioning;
- Collision with turbine rotor blades;
- Loss, degradation or fragmentation of supporting habitats; and
- Behavioural displacement from important habitats or flight paths due to the presence of the wind turbines.

5.3.3 The impact assessment process involves several steps. Initially, there is an evaluation of the importance (i.e. 'sensitivity') of the area of the 29 Turbine Proposed Development area for the species under consideration. The sensitivity evaluation is informed by data derived from several sources including the results of surveys completed between August 2018 and August 2019. Also considered is information from various other sources including, data from a number of previous surveys of the area (i.e. from 2002 to 2019 related to the EIA, pre- and post-construction monitoring of Glendoe Hydroelectric Scheme and Stronelairg Wind Farm) and records of key species provided by the Royal Society for the Protection of Birds (RSPB) and Highland Raptor Study Group (HRSG).

5.3.4 The baseline surveys followed standard methods for the assessment of onshore wind farms and were agreed in consultation with NatureScot (formerly Scottish Natural Heritage) as part of the EIA Scoping process (see Section 9.6 of the EIA Report April 2020). Also agreed during scoping were the key species that should be the focus of the assessment and the range of potential effects that would need to be considered.

5.3.5 Surveys for breeding birds, with a particular focus on relatively scarce breeding raptors and upland waders (e.g. golden eagle, peregrine, hen harrier, merlin, golden plover, dunlin and greenshank) were completed during spring and summer 2019. Surveys for wild geese and swans, and use of the site by waders and moorland raptors outside of the breeding season, were completed during autumn 2018 to spring 2019, incorporating the peak migration periods.

5.3.6 A core survey area was established which included the western and eastern clusters and a 500m wide strip around the potential wind turbine development areas (see **Figure 5.2a-b**). For key raptor species, the potential development area and a wider buffer zone, up to 2km wide, was also included in the survey.

5.3.7 The legislation, policies and guidance that informed the EIA assessment (as set out in Section 9.4 of Chapter 9 to the EIA Report, April 2020) remain unchanged for this assessment review.

5.4 Baseline Summary

5.4.1 Baseline data to inform the assessment of the 36 Turbine Scheme was collected between August 2018 and August 2019. This data, along with records available from other sources (including pre and post construction monitoring for the Stronelairg wind farm which is adjacent to the 29 Turbine Proposed Development) is considered sufficient, in this case[3], to inform this revised assessment.

[3] The survey data is less than 5-years old (which is the typical cut-off point for the validity of baseline bird survey data used in EIA) and the changes to the Proposed Development are a reduction in scale of the wind farm to what was proposed and assessed originally.

5.4.2 The results of the baseline surveys and collated information from the desk study are summarised in Section 9.6 of Chapter 9 of the EIA Report (April 2020). In summary, bird flight activity surveys were completed between August 2018 and August 2019. Suitable vantage points were established, overlooking the proposed wind farm, and watches were completed through the year and at different times of day to record flight activity by key species within the airspace that the wind turbines would occupy (see **Figure 5.3a-b**). Key species recorded during the flight activity surveys included golden eagle (*Aquila chrysaetos*), white-tailed eagle (*Haliaeetus albicilla*), osprey (*Pandion haliaetus*), peregrine (*Falco peregrinus*) and red kite (*Milvus milvus*), see **Figures 5.4** to **5.8**. Activity was much lower for all species during the winter months when the area was covered in snow for extended periods. Golden eagle activity was largely confined on the slopes and ridges around the periphery of the 29 Turbine Proposed Development, this was consistent with the findings of the modelling studies. Flight activity by other key species was sporadic showing no clear spatial concentrations, with the exception of red kite where there was more activity by hunting birds recorded within and near to the eastern survey area.

5.4.3 The use of waterbodies within the survey area was also monitored regularly through the whole survey period. Red-throated diver (*Gavia stellata*), which breed in the surrounding area, i.e. >2km from the 29 Turbine Proposed Development, were recorded occasionally using Glendoe Reservoir as were whooper swan (*Cygnus cygnus*) and common scoter (*Melanitta nigra*), which also breed in the surrounding area. There was no evidence of any areas within or near to the 29 Turbine Proposed Development (i.e. within 500m of the site boundary) being used regularly by appreciable numbers of wild geese or swans during the survey period. There was some migratory movement of geese, primarily greylag geese (*Anser anser*), through the survey area during September 2018, however most of this activity was above the collision risk zone.

5.4.4 The 2019 breeding bird surveys confirmed the presence of populations of breeding golden plover (*Pluvialis apricaria*) and dunlin (*Calidris alpina schinzii*) within the western and eastern clusters (see Figure 5.9a-b). Breeding golden plover are not currently of national conservation concern but are a species that is considered vulnerable to the effects of wind farm construction and operation and at risk from cumulative effects at a regional-national level (i.e. the combined effects on the population from wind farm development generally). Dunlin is a breeding wader that appears to be less vulnerable to operational wind farm effects than golden plover but is of national conservation concern (UK Amber list, due to recent population declines). Both species are of conservation importance at the European level (i.e. listed on Annex I of the EC Birds Directive). The estimated number of territories within the survey area were confirmed to be of local-scale importance for golden plover and regional-scale importance for dunlin.

5.4.5 The western survey area was also used by breeding greenshank (*Tringa nebularia*) in 2019 and there are previous records of breeding activity in the vicinity of the eastern and western survey areas. Based on the survey findings and information collated from other sources, the western survey area supports up to two breeding pairs and the eastern area one pair, which is a population of regional importance. Greenshank is listed on Schedule 1 to the Wildlife & Countryside Act (1981, as amended) and is on the UK Amber List of Birds of Conservation Concern.

5.4.6 There was no evidence of any breeding attempts by any scarce birds of prey (e.g. peregrine, merlin, hen harrier, short-eared owl) within the raptor survey area during 2019 and no evidence of previous breeding activity from the data collated from other sources. In the surrounding area (i.e. >2km from the 29 Turbine Proposed Development) there are up to five golden eagle territories, most of which were occupied by breeding pairs during 2018-2019. This is a population of regional importance. The

extent to which the 29 Turbine Proposed Development is used by golden eagle (hunting, display, territorial interactions etc.) was a key focus of the baseline surveys, informed by data provided by HRSG and mathematical modelling of breeding and non-breeding golden eagle habitat use (see Technical Appendices 9.2 of the EIA Report and the Confidential Ornithological Annex to Chapter 9 of the EIA Report (April 2020)). Golden eagle is on Schedule 1 to the Wildlife & Countryside Act, Annex I of the EC Birds Directive and currently on the UK Green List. The golden eagle population with the region (i.e. the Central Highlands NHZ 10) has increased in recent years and is currently considered to be in 'favourable' conservation status.

5.4.7 The surveys provided data to allow a systematic evaluation of the use of all habitats within the area of the 29 Turbine Proposed Development. The importance (or sensitivity) of the bird populations that use the area was determined with reference to the survey results and reliable information, where available, on current regional and national population sizes. This enabled the assessment of effects at various geographical scales (i.e. local, regional and national population levels) depending on what was appropriate for the species being considered.

5.4.8 Taking into consideration the conservation status, size and sensitivity of the populations affected and information available from the scientific literature about the vulnerability of the species to the range of potential impacts from onshore wind farm development. Where there was uncertainty about the potential importance of the area for any species then this was accounted for in the assessment. For example, if there was suitable habitat present but no, or limited, presence of the species during the survey period and the realistic potential for use to increase in the future, then conservative assumptions were made in the sensitivity evaluation process. This provided the basis for a systematic, evidence-based assessment to be made of the potential impacts on each sensitive receptor.

5.4.9 No change to the assessment of ornithological receptor sensitivity included in the EIA Report (April 2020) (as summarised in **Table 5.1**) is proposed.

5.4.10 The sensitivity of the populations of key bird species supported by study area has been systematically evaluated based on information drawn from desk study and field surveys. The sensitivity values for the various receptors ranges from 'Medium' (i.e. population / feature important Regional-scale) to 'Low' (i.e. population / feature important at a Local-scale). **Table 5.1** provides a summary of the sensitivity assessment for all ornithological receptors. The features / species highlighted in bold are considered as key sensitive receptors for the assessment.

Table 5.1: Sensitivity of the Evaluated Ornithological Receptors

Receptor	Western Area*	Eastern Area*	Whole Area*
Monadhliath SSSI	**n/a**	**High**	**High**
Whooper swan	Low (LH)	Low (LH)	Low (LH)
Common scoter	**Medium**	**Low (LH)**	**Medium**
Black grouse	Low (LM)	Negligible	Low (LM)
Red-throated diver	**Medium**	**Negligible**	**Medium**
Slavonian grebe	Negligible	Negligible	Negligible
Osprey	**Low (LH)**	**Low (LH)**	**Low (LH)**
Golden eagle	**Medium**	**Medium**	**Medium**
Hen harrier	Negligible	Negligible	Negligible
Red kite	**Negligible**	**Low (LH)**	**Low (LH)**
White-tailed eagle	**Low (LH)**	**Low (LH)**	**Low (LH)**
Golden plover	**Low (LH)**	**Low (LH)**	**Low (LH)**
Dotterel	Negligible	Negligible	Negligible
Dunlin	**Medium**	**Medium**	**Medium**
Greenshank	**Medium**	**Medium**	**Medium**
Merlin	**Low (LH)**	**Negligible**	**Low (LH)**
Peregrine	**Low (LH)**	**Low (LH)**	**Low (LH)**

** LH = Local High, LM = Local Medium, LL = Local Low.*

5.4.11 Some of the species listed in **Table 5.1**, which were scoped out of detailed consideration for the EIA Report (April 2020) assessment, would be covered by best practice measures to avoid or reduce potential impacts during the breeding season. For example, black grouse that lek near to the main access track (i.e. well outside of the area of the 29 Turbine Proposed Development) are at risk of significant disturbance and vehicle collision from construction traffic during the spring. Measures are outlined in Technical Appendix 9.4 of the EIA Report (April 2020) to address this and would remain applicable for the 29 Turbine Proposed Development.

5.5 Assessment Review & Update

Introduction

5.5.1 This section of the Chapter focuses on the changes to the 36 Turbine Scheme and the extent to which the reduction in the number of wind turbines for the 29 Turbine Proposed Development would result in a material change to the conclusions of the assessment in the EIA Report (April 2020). The type and scale of the potential impacts of the proposed wind farm development on each ornithological receptor was determined and presented in detail in section 9.8 of Chapter 9 of the EIA Report (April 2020).

Mitigation & Monitoring Summary

5.5.2 This assessment review considers the mitigated effects (i.e. the residual effects as stated in the EIA Report (April 2020)) of the 29 Turbine Proposed Development. The suite of mitigation and

monitoring measures that were committed to in the EIA Report (April 2020) remain in place for the 29 Turbine Proposed Development and this has been considered in the assessment review. In summary, the range of proposed mitigation and monitoring measures are as follows:

- Design - the layout of the 36 Turbine Scheme was informed by a constraints assessment related to certain key receptors including breeding golden eagle and greenshank. Regularly used breeding locations and other areas of importance were avoided where possible (NB this constraints information remains relevant to the design of the 29 Turbine Proposed Development and the 29 Turbine Proposed Development further avoids areas used by these species);
- Construction Disturbance – best-practice measures are proposed to further reduce potential effects on breeding birds during construction and help ensure that the proposed works proceed lawfully with respect to the legal protections. An outline BPP, which further details the proposed approach to minimising effects on breeding birds during the wind farm construction works, was provided in Technical Appendix 9.4 to the EIA Report (April 2020);
- Breeding Bird Monitoring – a detailed breeding bird monitoring plan would be developed, in consultation with NatureScot, at least 12 months prior to the start of construction works. The monitoring plan would detail survey methods, and the reporting mechanism, for each species listed in **Table 5.1** and would start (as a minimum) in the breeding season prior to works commencing and for at least the first ten years of wind farm operation (i.e. annually for the first three years, then fifth and tenth years). At which point the need for further monitoring would be reviewed. Annual surveys for golden eagle would continue for the life-time of the wind farm and would include continuing to gathering data on golden eagle breeding success and productivity;
- Bird Carcase Monitoring – Systematic bird carcass searches would be completed annually for three years after the wind farm becomes operational and then in the fifth and tenth years. The searches would be within a 50m radius area of each turbine and would be completed on a monthly basis. The monitoring would be preceded by trials to determine values for site-specific biases that affect estimates of bird mortality, such as scavenger removal rates and search accuracy;
- Breeding Eagle Protection & Conservation - the potential effects of the 29 Turbine Proposed Development on golden eagle and white-tailed eagle, in particular, would be monitored as part of the pre- and post-construction breeding bird surveys (see above). It is also proposed that the measures undertaken for Stronelairg Wind Farm to reduce the risk to golden eagle from that development (i.e. removal of deer carcases / gralloch from within the wind farm area and provision of winter larders in suitable locations) would also apply to the 29 Turbine Proposed Development. Support for continued eagle monitoring and conservation management measures within NHZ 10, as part of the existing Regional Eagle Conservation Management Plan, is also proposed; and
- Habitat Management Plan (HMP) - A HMP is proposed to address the effects of the construction of the 29 Turbine Proposed Development on blanket bog vegetation communities (see **Chapter 4: Ecology**). Suitable areas for peatland restoration would be identified through the HMP. A total of approximately 150ha of blanket bog would be subject to enhancement measures to offset the effects of the Proposed Development (see **Chapter 4**, section 4.6). This includes an area within the Monadhliath SAC/SSSI (see **Technical Appendix 4.5**). The detailed HMP will be subject to agreement with NatureScot and the relevant landowners prior to being implemented.

Construction Disturbance and Displacement

5.5.3 There is the potential for construction works to have localised effects on bird breeding success for up to three breeding seasons. Under the 29 Turbine Proposed Development, although the duration of the construction period would be marginally reduced due to the smaller size of the wind farm, the potential duration of such effects would be unchanged. Measures are proposed to help ensure that impacts on all breeding birds are minimised and that rarer species which are specially protected from disturbance while nesting are properly safeguarded (see Technical Appendix 9.4 of the EIA Report (April 2020)).

5.5.4 A summary of the residual assessment of construction disturbance and displacement effects from the 29 Turbine Proposed Development on each receptor is provided in **Table 5.2**. This is unchanged from the conclusions of the assessment for the 36 Turbine Scheme.

Table 5.2: Construction phase – residual assessment of construction disturbance / displacement (potentially significant effects highlighted in bold)

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Monadhliath SSSI	High	Negligible	Minor	Short-term	Near-certain
Common scoter	Medium	Negligible-Low	Minor	Short-term	Near-certain
Red-throated diver	Medium	Negligible-Low	Minor	Short-term	Near-certain
Osprey	Low (Local High)	Negligible	Negligible	Short-term	Near-certain
Golden eagle	Medium	Negligible-Low	Minor	Short-term	Near-certain
Red kite	Low (Local High)	Negligible	Negligible	Short-term	Near-certain
White-tailed eagle	Low (Local High)	Negligible	Negligible	Short-term	Near-certain
Golden plover	Low (Local High)	Negligible-Low	Minor	Short-term	Near-certain
Dunlin	Medium	Negligible-Low	Minor	Short-term	Near-certain
Greenshank	Medium	Negligible-Low	Minor	Short-term	Near-certain
Merlin	Low (Local High)	Negligible	Negligible	Short-term	Near-certain
Peregrine	Low (Local High)	Negligible	Negligible	Short-term	Near-certain

Direct Habitat Loss / Degradation

5.5.5 The assessment of the 36 Turbine Scheme concluded that there would be no significant direct habitat loss for any receptor. This remains the case for the 29 Turbine Proposed Development. There is the potential for some degradation of surface waters (of importance to species such as greenshank for example) as a result of siltation and potential chemical pollution during the construction process. However, it is considered reasonable to assume that good practice pollution avoidance and control measures, as set out in the outline Construction Environmental Management Plan, would be effectively designed and implemented. This would help to ensure that potential impacts are avoided / minimised and that significant effects from habitat degradation would be avoided for all species.

5.5.6 A summary of the residual assessment of construction disturbance and displacement effects for the 29 Turbine Proposed Development on each receptor is provided in **Table 5.3**. This is unchanged from the conclusions of the assessment of the 36 Turbine Scheme.

Table 5.3: Construction phase – residual assessment of direct habitat loss / degradation (potentially significant effects highlighted in bold)

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Monadhliath SSSI	High	None	n/a	n/a	Certain
Common scoter	Medium	Negligible	Negligible	Long-term	Near-certain
Red-throated diver	Medium	Negligible	Negligible	Long-term	Near-certain

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Osprey	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Golden eagle	Medium	Negligible	Negligible	Long-term	Certain
Red kite	Low (Local High)	Negligible	Negligible	Long-term	Certain
White-tailed eagle	Low (Local High)	Negligible	Negligible	Long-term	Certain
Golden plover	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Dunlin	Medium	Negligible	Negligible	Long-term	Near-certain
Greenshank	Medium	Negligible	Negligible	Long-term	Near-certain
Merlin	Low (Local High)	Negligible	Negligible	Long-term	Certain
Peregrine	Low (Local High)	Negligible	Negligible	Long-term	Certain

Operational Displacement / Barrier Effects

5.5.7 No significant effects on any receptors are predicted to arise as a result of operational displacement or barrier effects. No specific mitigation is proposed to address these effects. However, the proposed HMP will also help to address habitat displacement effects on breeding waders (particularly golden plover and dunlin) in the long-term.

5.5.8 The 29 Turbine Proposed Development would result in a reduction in this effect for some species due to the removal of 7 turbines from the 36 Turbine Scheme layout. **Table 5.4** provides a summary of the change in number of breeding territories affected by the 29 Turbine Proposed Development in comparison to the 36 Turbine Scheme. This shows a marginal reduction in the number of golden plover (decreasing from 19 to 16) and dunlin (decreasing from 13 to 10) breeding territories potentially affected by the 29 Turbine Proposed Development.

Table 5.4: Apparent breeding territories of species of conservation concern from the 2019 surveys (estimates for the 36 Turbine Scheme in parentheses where they differ)

Common Name	Western Core Survey Area	Western Cluster (500m buffer)	Eastern Core Survey Area	Eastern Cluster (500m buffer)	Total (Core Survey Areas)	Total (500m turbine buffer)
Golden Plover	20	11 (14)	12	5	**32**	**16 (19)**
Ringed Plover	1	1	0	0	**1**	**1**
Dunlin	16	9 (11)	6	1 (2)	**22**	**10 (13)**
Common Sandpiper	2	2	3	1	**5**	**3**
Common Snipe	1	1	0	0	**1**	**1**
Greenshank	1	0 (1)	0	0	**1**	**0 (1)**
Teal	3	2	0	0	**3**	**2**
Mallard	2	2	0	0	**2**	**2**
Red Grouse	22	14 (17)	18	8 (9)	**40**	**22 (26)**

5.5.1 In relation to golden eagle, a species considered to be particularly vulnerable to the effects of wind farm displacement, there would also be a marginal reduction in potential effect of the 29 Turbine Proposed Development in comparison to the 36 Turbine Scheme. Resident breeding golden eagles in Scotland show a strong displacement response in relation to operational wind farms (Walker *et*

al. 2005[4], Fielding &Haworth 2010[5], 2015[6]). Also, data from satellite tracking of young golden eagles in Scotland, including data collected from Stronelairg wind farm, has shown relatively consistent displacement response with golden eagles rarely approaching closer than 80m from turbine blades and a significant reduction in activity within a wind farm as a whole (i.e. displaying strong 'macro-avoidance'). However, the displacement distance from individual wind turbines varies in relation to wind speed, habitat quality (at the turbine location and in the wider area), the number of turbines, whether the blades are turning and the position of the turbine relative to the wider wind farm layout (Whitfield & Fielding 2017[7], Fielding *et al*. 2021[8]).

5.5.2 The displacement zone affecting both territory-holding and non-territory holding golden eagles for the assessment of the 36 Turbine Scheme was assumed to be 500m from the outermost proposed wind turbines. Based on the most recent published research this is possibly an overly precautionary assumption. However, for the ease of comparison to the 36 Turbine Scheme the 500m wide buffer zone for displacement has been assumed in the assessment of the 29 Turbine Proposed Development. The potential consequences of displacement for territory holding and non-territory holding golden eagles was discussed in Section 9.8 of Chapter 9 of the EIA Report (April 2020) and is not repeated here.

5.5.3 The operation of the 29 Turbine Proposed Development would not have any appreciable direct effect on known breeding sites for golden eagle (i.e. there is no direct line of sight to any eyrie sites used in the past five years and the proposed wind turbines are located more than 2km from all of the eyries / territory centres).

5.5.4 There is the potential for displacement of hunting birds that use the site and breed in the wider area (up to four breeding territories) as well as non-breeding birds that range over a larger area and occasionally use the site. The potential magnitude of this effect will be marginally reduced with the removal of 7 turbines from the 36 Turbine Scheme.

5.5.5 This effect was reduced though the original wind farm design process (i.e. design mitigation). The initial wind turbine layout, informed by flight activity results and territory modelling, had been altered to minimise encroachment into areas of better-quality habitat closest to nearby golden eagle territory centres. The overall objective was to ensure that the predicted loss (i.e. range use overlap) to any of the territories affected would not exceed 5% (i.e. predicted range use overlap by the wind farm a +500m wide buffer around the outermost turbines). A predicted loss of >5% of breeding range use is considered a potentially significant impact. The actual impact on individual breeding pairs is dependent on a range of factors. For example, the productivity of the pair is an indicator of territory habitat quality, with more productive pairs assumed to be more resilient to small habitat losses. Also, the amount of suitable habitat that the pair have potential access to, which can be used to compensate for losses. Access to such habitat can be constrained by the presence of adjacent breeding pairs. This is particularly important given that one of the main territories that could be affected is believed to be constrained in terms of the potential for the pair to exploit alternative

[4] Walker, D., McGrady, M., McCluskie, A., Madders, M., McLeod, D. (2005). Resident Golden Eagle Ranging Behaviour Before and After Construction of a Windfarm in Argyll. Scottish Birds, 25, 24-40.

[5] Fielding, A.H. & Haworth, P.F. (2010). Golden Eagles and Wind Farms. Haworth Conservation, Mull, Scotland.

[6] Fielding, A.H. & Haworth, P.F. (2015). Edinbane Windfarm: Ornithological Monitoring 2007–2014. A Review of the Spatial Use of the Area by Birds of Prey. Haworth Conservation, Mull, Scotland.

[7] Whitfield, D.P. & Fielding, A.H. (2017). Analyses of the Fates of Satellite Tracked Golden Eagles in Scotland. Scottish Natural Heritage Commissioned Report No. 982.

[8] Fielding, A.H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E., Whitfield, D.P. (2021). Non-territorial GPS-tagged golden eagles Aquila chrysaetos at two Scottish wind farms: Avoidance influenced by preferred habitat distribution, wind speed and blade motion status. PLoS ONE 16(8): e0254159. https://doi.org/10.1371/journal.pone.0254159

hunting grounds due to the proximity of adjacent occupied golden eagle territories and the extent of existing unsuitable habitats within their home range.

5.5.6 PAT (McLeod *et al*. 2002[9]) and GET modelling (Fielding *et al*. 2019[10]) was used to inform the assessment of the 36 Turbine Scheme (see Appendix 9.2 and the Confidential Annex to Chapter 9 of the EIA Report (April 2020) for further details). The PAT model is used to predict range use probability for breeding golden eagles (i.e. time spent in different parts of the territory based on habitat quality and distance from the nest site). It also determines the likely range boundaries based on the proximity of the territory centre to other occupied territories in the surrounding area. The GET model is used to predict habitat use by eagles generally, based on the presence of suitable habitat, slope, aspect and distance to a ridge. The preference index that underlies the GET model is based on an extensive dataset of GPS positions of young satellite tagged golden eagles in Scotland.

5.5.7 Considering the 36 Turbine Scheme in isolation, the PAT model estimated that range use overlap for the scheme could vary from 0.8 to 2.7% of the affected territories. For the closest territory centre to the 36 Turbine Scheme the PAT model predicted a 2.7% overlap. Using a different method of predicting golden eagle habitat use or preference, the GET model predicted a 2.4% overlap of areas likely to be used, or used more than expected according to their availability in the landscape (i.e. predicted use rating of six and above in the preference scale used in the GET model) within that pair's assumed territory boundary (as defined by the PAT model). Whilst this is clearly a reduction in the extent of available suitable habitat it was considered unlikely that, at this relatively small scale of assumed loss, this pair (or any of the other territories potentially affected) would suffer significant reduction in breeding productivity as a result. Given the locational and topographical context of the 36 Turbine Scheme, relative to the existing Stronelairg Wind Farm and that the proposed wind turbines would be located at territory edges (i.e. there would be no appreciable 'fragmentation / barrier effect' within any territory), this was not considered to be a significant effect for any golden eagle territory.

5.5.8 The PAT model has not been re-run for the assessment of the 29 Turbine Proposed Development but the removal of seven turbines will clearly result in a marginal reduction in the potential loss of supporting habitat. The turbines that have been removed from the 36 Turbine Scheme are not located in areas that were predicted by the PAT model to be particularly important in supporting any of the breeding territories considered in the assessment of the 36 Turbine Scheme. The conclusions of the assessment of the 36 Turbine Scheme are therefore considered to be unchanged for the 29 Turbine Proposed Development in this regard.

5.5.9 There is also the potential for habitat loss effects on non-breeding, young golden eagles due to wind farm displacement. Using the GET model, the 36 Turbine Scheme was predicted to result in the potential loss (or reduction in use), through displacement, of 3.6km^2 of suitable golden eagle habitat. In the context of the extent of suitable habitats within the wider NHZ and, given that young eagles can range much more widely than the Central Highlands NHZ area, this was not considered to be significant for that population. For the 29 Turbine Proposed Development the estimate of potential habitat loss arising from wind farm displacement (based on the GET model and assuming a precautionary 500m buffer around the outermost wind turbines) has decreased from 3.6km^2 to 2.14km^2. This is a c. 40% reduction in potential habitat loss in comparison to the 36 Turbine Scheme.

[9] McLeod, D.R.A., Whitfield, D.P., Fielding, A.H., Haworth, P.F. & McGrady, M.J. (2002). Predicting home range use by golden eagles Aquila chrysaetos in western Scotland. Avian Science. 2: 183-198.

[10] Fielding, A.H., Haworth, P.F., Anderson, D., Benn, S., Dennis, R., Weston, E. & Whitfield, D.P. (2019). A simple topographical model to predict Golden Eagle Aquila chrysaetos space use during dispersal. Ibis.

5.5.10 A summary of the residual assessment of operational displacement effects for the 29 Turbine Proposed Development on each receptor is provided in **Table 5.5**. Although the 29 Turbine Proposed Development results in an appreciable reduction in total area potentially subject to displacement effects this is not considered to be a large enough difference to warrant a change to the overall conclusions of the assessment of the 36 Turbine Scheme for any receptor.

Table 5.5: Operational phase – residual assessment of displacement and barrier effects (potentially significant effects highlighted in bold)

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Monadhliath SSSI	High	Negligible	Minor	Long-term	Near-certain
Common scoter	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red-throated diver	Medium	Negligible-Low	Minor	Long-term	Near-certain
Osprey	Low (Local High)	Negligible-Low	Minor	Long-term	Near-certain
Golden eagle	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red kite	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
White-tailed eagle	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Golden plover	Low (Local High)	Low	Minor	Long-term	Probable
Dunlin	Medium	Negligible-Low	Minor	Long-term	Probable
Greenshank	Medium	Negligible-Low	Minor	Long-term	Probable
Merlin	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Peregrine	Low (Local High)	Negligible	Negligible	Long-term	Near-certain

5.5.11 A summary of the residual assessment of operational displacement and barrier effects for the 29 Turbine Proposed Development on each receptor is provided in **Table 5.6**. This is unchanged from the conclusions of the assessment of the 36 Turbine Scheme.

Table 5.6: Operational phase – assessment of displacement and barrier effects (potentially significant effects highlighted in bold)

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Monadhliath SSSI	High	Negligible	Minor	Long-term	Near-certain
Common scoter	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red-throated diver	Medium	Negligible-Low	Minor	Long-term	Near-certain
Osprey	Low (Local High)	Negligible-Low	Minor	Long-term	Near-certain
Golden eagle	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red kite	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
White-tailed eagle	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Golden plover	Low (Local High)	Low	Minor	Long-term	Probable
Dunlin	Medium	Negligible-Low	Minor	Long-term	Probable
Greenshank	Medium	Negligible-Low	Minor	Long-term	Probable
Merlin	Low (Local High)	Negligible	Negligible	Long-term	Near-certain
Peregrine	Low (Local High)	Negligible	Negligible	Long-term	Near-certain

Operational Collision Risk

5.5.12 The risk of bird mortality from collision with the 29 Turbine Proposed Development has been assessed using data gathered during systematic flight activity surveys and using a standard wind farm EIA collision risk model. As with the assessment of the 36 Turbine Scheme, whilst collisions are predicted, the levels are not considered to be of concern at a population level beyond a local scale for all species. There is some recognised additional uncertainty with respect to collision risk for greenshank and so a conservative approach has been taken in the assessment of potential effects for this species.

5.5.13 The 29 Turbine Proposed Development would result in a reduction in estimated annual collision mortality for most species due to the removal of seven turbines from the 36 Turbine Scheme. This includes the removal of some turbines where relatively high levels of flight activity had been recorded during the baseline surveys. For example, the turbine removed from Carn Fraoich (eastern turbine cluster) in relation to golden eagle flight activity (see Figure 5.4b). This reduction in effect has been quantified by re-calculating collision rates following the standard 'Band model' as recommended by NatureScot. The results of this re-calculation are provided in **Table 5.7**.

Table 5.7: Summary of the revised collision risk model results – peak annual collisions estimated for target species at the assumed avoidance rates (36 Turbine Scheme estimates in parentheses).

Species	Avoidance Rate (%)	West Collisions / year	East Collisions / year	Totals	
				Collisions over 50 years	Years between collisions
Osprey	98	0.03 (0.04)	0.00 (0.01)	1.78 (2.36)	29.04 (21.19)
Golden Eagle (All)	99	0.07 (0.10)	0.07 (0.08)	6.82 (8.95)	7.33 (5.59)
Golden Eagle (Juv.)	99	0.05 (0.07)	0.01 (0.01)	2.79 (3.97)	17.94 (12.59)
Golden Eagle (Sub-ad/ Ad.)	99	0.02 (0.03)	0.06 (0.07)	4.04 (4.98)	12.38 (10.04)
Red Kite	99	0.01 (0.01)	0.06 (0.07)	3.43 (3.83)	14.57 (13.05)
White-tailed Eagle	95	0.11 (0.14)	0.03 (0.03)	6.89 (8.35)	7.25 (5.99)
Golden Plover*	98	0.02 (0.01)	~	0.85 (0.55)	59.16 (91.68)
Merlin	98	0.02 (0.02)	~	0.85 (1.04)	58.85 (48.24)
Peregrine	98	0.03 (0.03)	0.01 (0.02)	2.15 (2.18)	23.27 (22.94)

** The golden plover collision risk estimates have increased, in comparison to the 36 Turbine Scheme, as all the recorded flightlines were within the 29 Turbine Proposed Development flight risk area (western cluster), there are no flights in the vicinity of the turbines that have been removed. The calculation of collision risk for the 29 Turbine Proposed Development therefore involves the same flight activity at risk height as the 36 Turbine Scheme but within a smaller volume. Consequently, the estimated number of annual transits through the rotors has increased but remains at a non-significant level of predicted mortality.*

5.5.14 In relation to greenshank, the seven turbines removed from the 36 Turbine Scheme are likely to result in a material reduction in the risk of collision (and displacement) effects on this species for the 29 Turbine Proposed Development. This species is likely to be under-recorded during the flight activity surveys and standard modelling methods are therefore likely to result in an under-estimate of collision risk. A confirmed breeding territory, associated with the western survey area, was considered in the design of the 36 Turbine Scheme. The 36 Turbine Scheme was altered to avoid the more sensitive parts of this area. The six turbines removed from the western cluster will increase separation of the 29 Turbine Proposed Development from known breeding sites of this species. The operational collision mortality effects on greenshank have been conservatively re-assessed, taking into consideration the uncertainties about estimating collision rates for this species, to be Negligible-Low (from Low originally), resulting in a significance level of Minor in the long-term, which is not significant and unchanged from the assessment of the 36 Turbine Scheme.

5.5.15 Measures undertaken for Stronelairg Wind Farm to reduce the risk to golden eagle (i.e. removal of deer carcases / gralloch from within the wind arm area and provision of winter larders in suitable locations) would also apply to the 29 Turbine Proposed Development. Financial support for

continued monitoring of golden eagle, as part of the Regional Eagle Conservation Management Plan, is also proposed.

5.5.16 **Table 5.8** provides the residual assessment of collision risk for each receptor for the 29 Turbine Proposed Development.

Table 5.8: Operation phase – residual assessment of collision risk from wind turbines (potentially significant effects highlighted in bold)

Receptor	Sensitivity	Effect	Significance level	Duration	Confidence
Monadhliath SSSI	High	Negligible	Minor	Long-term	Near-certain
Common scoter	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red-throated diver	Medium	Negligible-Low	Minor	Long-term	Near-certain
Osprey	Low (Local High)	Low	Minor	Long-term	Near-certain
Golden eagle	Medium	Negligible-Low	Minor	Long-term	Near-certain
Red kite	Low (Local High)	Low	Minor	Long-term	Near-certain
White-tailed eagle	Low (Local High)	Low	Minor	Long-term	Near-certain
Golden plover	Low (Local High)	Negligible-Low	Minor	Long-term	Near-certain
Dunlin	Medium	Negligible-Low	Minor	Long-term	Near-certain
Greenshank	Medium	Negligible-Low	Minor	Long-term	Probable
Merlin	Low (Local High)	Low	Minor	Long-term	Near-certain
Peregrine	Low (Local High)	Negligible-Low	Minor	Long-term	Near-certain

Decommissioning

5.5.17 As was the case for the 36 Turbine Scheme, the residual effects of decommissioning of the 29 Turbine Proposed Development are considered to be broadly similar to those during construction and are therefore not more than minor for all species and not significant. Prior to decommissioning, a thorough pre-works survey will be completed to determine the species present, their distribution and abundance and to inform the measures required to reduce any potentially significant impacts and help ensure that the works proceed lawfully with respect to the legislation protecting breeding birds.

Cumulative Effects

5.5.18 Careful consideration was given in the 36 Turbine Scheme assessment to the potential for significant cumulative effects to occur from the combined effects of the turbines with existing and proposed wind farms in the wider region. The assessment considered information from published impact assessments that were available at that time and considered wind farms that were operational or in the planning process at the time the assessment was made (i.e. February 2020). Species that were a focus for this aspect of the assessment included golden eagle, golden plover, dunlin and greenshank. Effects on golden eagle were considered initially in a local context and in terms of the wider regional breeding population (Central Highlands NHZ).

5.5.19 In relation to potential cumulative wind farm displacement effects on golden eagle, taking into account Stronelairg and other proposed wind farms that could affect the same territories as the 36 Turbine Scheme and 29 Turbine Proposed Development (i.e. Dell[11, 12]), the combined predicted

[11] The layout of the proposed Dell wind farm has changed since the original cumulative assessment was completed, being reduced from 14 to 9 turbines (due to LVIA constraints), however the area that the proposed wind farm would occupy is broadly similar to what was considered in the original assessment.

[12] The Glenshero wind farm development has recently been refused planning consent and has been excluded from the assessment of potential cumulative effects for the 29 Turbine Proposed Development.

habitat loss was assessed as not significant for all territories affected and for the NHZ population as a whole.

5.5.20 Consideration was also given to potential cumulative operational displacement and collision mortality effects on the NHZ breeding populations of golden plover, dunlin and greenshank. The 36 Turbine Scheme assessment concluded, on a precautionary basis, that significant cumulative operational effects (at the NHZ level) are possible for breeding golden plover and greenshank. In relation to golden plover, this conclusion would have applied whether the 36 Turbine Scheme had been consented and built or not, on the assumption that all the other proposed wind farms that could affect the golden plover NHZ population, considered in the assessment (excluding Glenshero with respect to the assessment of the 29 Turbine Proposed Development), were consented and built. However, it was recognised that there is uncertainty about the long-term effects of wind farm development on these species, as well as uncertainty about current NHZ population sizes, and that non-significant cumulative effects are also realistically possible in the long-term.

Summary of Available Information

5.5.21 The order in which developments have been factored into the assessment when considering cumulative impacts is set out below:

- Developments that are already operational, and those that are consented and likely to be built should be considered first as the impacts arising from these (once mitigation has been factored in) are unavoidable; and
- Applications that have been formally submitted to a planning authority or Scottish Government but have yet to be determined, consented and built should then be factored in. Confidential data (e.g. on Schedule 1 species) from such assessments will not necessarily be in the public domain.

5.5.22 A list of the wind farm projects for the NHZ was collated and cross-referenced from Environmental Statements and EIA Reports, where available. NatureScot onshore wind farm proposals dataset (March 2022) was used to assist in collating the latest status and locations of the wind farm projects, coupled with information gathered for the EIA Report (April 2020).

5.5.23 Wind farm projects at the feasibility / scoping stage have been excluded from the cumulative assessment, as they generally do not have sufficient information on potential impacts to be included. Projects which have been withdrawn or refused have also been scoped out of this assessment.

5.5.24 **Table 5.9** provides a summary of information relating to wind farm proposals which are currently operational, in the planning process or post-consent / pre-construction stage that have the potential to result in cumulative effects at the scale of the NHZ. This updates the information collated in 2019 for the assessment of the 36 Turbine Scheme.

Table 5.9: Wind farm projects considered in the assessment of cumulative effects on NHZ 10 populations

Project Status	Site Name	No. of turbines / site area	Distance / Direction	Summary of relevant assessment information available (no. wader territories within wind farm)
Operational	Stronelairg	66 / 35km^2	<0.5km	Wind farm overlaps partially with three golden eagle territories, predicted to affect up to two pairs. Residual effects were reported as non-significant following implementation of a HMP and supplementary feeding plan. Estimated annual collision mortality for golden eagle of 0.14 (range of 0.08 – 0.21, assumed avoidance rate of 99%). 14-15 golden plover territories. 9-11 dunlin territories. No records of greenshank.
	Corriegarth (inc. extension)	23 / 6km^2	8.3km NE	Used by non-breeding golden eagle only, although re-occupation of territory is possible (this has occurred). Estimated annual collision mortality for golden eagle of 0.11 (99% avoidance). 7 golden plover territories. 4 dunlin territories. No records of greenshank.
	Dunmaglass	33 / 34km^2	10.3km N	Used by non-breeding golden eagle only, no nest within 2km. Loss of foraging habitat. Estimated annual collision mortality for golden eagle of 0.08 (adjusted for 99% avoidance). 4 golden plover territories. 3 dunlin territories. No records of greenshank.
	Farr	40/ 7km^2	28.6km NE	Low frequency of use by golden eagle. No CRM undertaken for golden eagle. 25 golden plover territories. 9-15 dunlin territories. No records of greenshank.
	Berry Burn	39 / 17km^2	64km NE	Infrequent activity by immatures golden eagles. No breeding territories affected. No CRM undertaken for golden eagle. 3 golden plover territories. No records of dunlin. No records of greenshank.

Project Status	Site Name	No. of turbines / site area	Distance / Direction	Summary of relevant assessment information available (no. wader territories within wind farm)
	Paul's Hill I	28 / 19km^2	64km NE	Site is not located within or near any known breeding territories and unlikely to be regularly used by golden eagle. No CRM undertaken for golden eagle. 1 golden plover territory.
	Rothes I	22 / 4km^2	75km NE	No records of golden eagle. No CRM undertaken for golden eagle. Unknown no. wader territories.
	Rothes II	18 / 4km^2	75km NE	No records of golden eagle. No CRM undertaken for golden eagle. 2 golden plover territories.
	Moy	20 / 12km^2	37.7km NE	Golden eagle recorded, but limited information provided. 2 golden plover territories. No records of dunlin. No records of greenshank.
	Glen Kyllachy	20 / 8km^2	27.6km NE	No evidence of breeding golden eagle within 15km of the site. Low levels of activity recorded. Estimated annual collision mortality for golden eagle of 0.043 (99% avoidance). 6-7 golden plover territories. 1-2 dunlin territories. No records of greenshank.
	Tom nan Clach	13 / 12km^2	40km NE	No breeding golden eagle territories within or near to the site. Low levels of activity by non-breeding birds. Estimated annual collision mortality for golden eagle of 0.016 (99% avoidance). 7 golden plover territories. No dunlin territories. No records of greenshank.
Consented	Aberarder	12 / 4km^2	17.6km NE	No effects on any golden eagle breeding territories reported. Area is primarily used by non-breeding young golden eagles. Estimated annual collision mortality for golden eagle of 0.114 (99% avoidance). 4 golden plover territories. No dunlin records. No records of greenshank.

Project Status	Site Name	No. of turbines / site area	Distance / Direction	Summary of relevant assessment information available (no. wader territories within wind farm)
	Cairn Duhie	20 / 6km^2	54.4km NE	No records of golden eagle. 6 golden plover territories. No dunlin records. No records of greenshank.
	Kellas	8 / area unknown	75km NE	No records.
	Meikle Hill	6 / 11km^2	73km NE	No records of golden eagle. 1 golden plover territory. No dunlin records. No records of greenshank.
	Paul's Hill II	6 / 19km^2	64km NE	No records of golden eagle. No golden plover records. No dunlin records. No records of greenshank.
	Dell (now in Scoping with a revised layout, information in this table refers to the original scheme)	14 / 15km^2	0.5km NE	Two golden eagle territories affected. Range use loss of 0.2% and 0.5% predicted. No significant effects reported. Estimated annual collision mortality for golden eagle of 0.022 (99% avoidance). 10 golden plover territories. No dunlin records. No records of greenshank.
In Planning	Cloiche (29 Turbine Proposed Development)	29 / 15km^2	n/a	Up to 4 golden eagle territories potentially affected. PAT model predicts range use overlap from 0.8 to 2.7% of the affected territories. For the closest territory centre the PAT model predicts a 2.7% overlap and the GET model a 2.4% overlap (NB these figures are based on the larger 36 Turbine Scheme). Estimated total annual collision mortality for golden eagle of 0.14 at 99% avoidance (0.06 for juvenile golden eagles, 0.08 for adults and sub-adults). 16 golden plover territories. 10 dunlin territories. 0-1 greenshank territories.
	Rothes III	29 / 14km^2	75km NE	No records of golden eagle. Golden plover flights recorded, no breeding records. No dunlin records. No greenshank records.

Golden Eagle – Cumulative Construction Effects

5.5.25 There is the potential for the construction phase of 29 Turbine Proposed Development to coincide with the construction of Dell Wind Farm. However, the locations of the construction sites should avoid any direct disturbance to known golden eagle breeding locations. The Applicants of Dell and the 29 Turbine Proposed Development have committed to ensure that potential impacts on breeding golden eagle from construction disturbance is minimised through pre-works surveys and careful management of the works sites. There is also a legal requirement to ensure that breeding golden eagle are not disturbed. The effectiveness of well-managed construction works avoiding significant long-term disturbance effects on breeding golden eagle is evident from the previous works completed for Glendoe Hydroelectric Scheme and Stronelairg Wind Farm and that this has not prevented the re-occupation and successful breeding of golden eagle during and following construction works.

5.5.26 In conclusion, it is considered unlikely that cumulative effects from overlapping construction phases could raise impacts to a significant level for the NHZ 10 breeding golden eagle population. The cumulative effect is considered to be no greater than Minor significance. The conclusions of the 36 Turbine Scheme assessment are unchanged in this regard.

Golden Eagle – Cumulative Operational Effects

5.5.27 In Scotland, golden eagles are considered to be at relatively greater risk of impact from range loss, resulting from wind farm displacement, than from collision mortality (e.g. Fielding *et al.* 2021[8]). Therefore, this assessment focuses on the potential for cumulative effects on breeding golden eagle arising from wind farm displacement.

5.5.28 The summarised reported assessments from the other wind farm projects potentially affecting the NHZ 10 golden eagle population are shown in **Table 5.8**. This confirms that only Stronelairg and Dell wind farms are likely to have potential effects on the same breeding territories that could be affected by the 29 Turbine Proposed Development.

5.5.29 In previous assessments NatureScot has advised that a 5% range overlap impact (using the PAT model) is a useful nominal threshold for potentially 'significant' range loss to occur.

5.5.30 In the Stronelairg ES the PAT model predicted range overlap of 6.6% and this was partially addressed through the improvement of habitat quality for golden eagle prey species (primarily red grouse) within a 485ha habitat management area. Supplementary winter feeding of golden eagles was also proposed. For the purposes of the assessment of the 36 Turbine Scheme, it was assumed that the net effect of the Stronelairg Wind Farm proposals has not been significant for the affected pairs. The pair with the closest territory centre successfully fledged of one chick in 2019 (the wind farm became operational in 2018), which indicates that the breeding productivity of this pair has not been significantly affected, although longer-term monitoring would be necessary to confirm this.

5.5.31 The PAT model was used to carry out an assessment of potential cumulative range loss for each breeding territory potentially affected by the 36 Turbine Scheme. The details are provided in the Confidential Annex. In summary, considering the 36 Turbine Scheme in isolation the predicted range overlap would be a maximum of 2.7% for territory EA2. Predicted range overlap for the other three territories is EA1 1.6%, EA3 0.1% and EA4 0.8%. As previously discussed, these predicted overlap areas are all on the outer fringes of favourable habitats within the territories, based on an assumed 6km radius limit from the territory centre. With the reduction in the number of wind turbines for

the 29 Turbine Proposed Development there would be a marginal reduction in potential range loss for territories EA1 and EA4, with no change to the estimated losses for EA2 and EA3.

5.5.32 Treating the existing operational wind farms (Stronelairg and Corriergarth) as now part of the baseline (i.e. that any range loss effects that have occurred and have been 'absorbed' without suffering any significant effects on breeding success or productivity) the PAT model predicted that the 36 Turbine Scheme, in combination with the other wind farm proposals affecting the same territories (i.e. Dell), would result in the combined range overlap of 5.2% for the EA2 territory. This is an increase from 2.7% when considering the 36 Turbine Scheme in isolation. None of the other territories would experience more than 2% cumulative range overlap / potential loss.

5.5.33 The potential cumulative effect on the EA2 territory is at the potential threshold for significance. This is particularly relevant in the case of resident breeding pairs with low productivity and/or existing constraints on their territory due to the proximity of neighbouring breeding pairs or unsuitable areas (e.g. commercial forestry, operational wind farms). Although the EA2 territory is constrained due to the presence of other golden eagle territories either side, unsuitable habitat and the proposed wind farm, in this case, the impact would affect a relatively successful pair (five-year mean for this pair is 0.8 chicks fledged). It is certainly possible that this pair would be able to adjust to this constraint by exploiting existing prey sources elsewhere within their territory. The location of the 29 Turbine Proposed Development, essentially within and around the fringes of the large plateau area that Stronelairg Wind Farm sits within, should help reduce the potential effect on this territory as developments are clustered within a large area of primarily lower quality habitat, in relation to important topographic features, for golden eagle. However, without undertaking a more detailed study of habitat quality, prey availability and range use it is not possible to be more categorical about the potential magnitude of effect with respect to breeding productivity.

5.5.34 Monitoring of this pair, and the other affected breeding territories, is proposed in order to determine if this has any material effect in the long-term. Any notable adverse effects, should they occur, could potentially be addressed through the RECMP, which the Applicant has committed to contribute funding towards.

5.5.35 In conclusion, in combination with other proposals (i.e. Dell Wind Farm in the case of EA2) a potentially significant reduction in habitat availability within one golden eagle territory could occur during the operation of the 29 Turbine Proposed Development. However, significant effects on this territory are considered to be uncertain given the recent history of breeding productivity for this pair and that the cumulative effect is very close to the nominal 5% threshold of potential significance.

5.5.36 The reported results of assessments of operational displacement for other existing and proposed wind farms located in the wider NHZ indicate that there are currently no other developments that could impact on breeding golden eagle population.

5.5.37 In conclusion, with respect to the wider NHZ 10 golden eagle population, 2 out of 21 breeding territories could suffer a reduction in breeding productivity as a result of cumulative wind farm displacement and loss of suitable habitat. In the context of the currently favourable conservation status of the NHZ population this is considered to be no greater than a Minor effect and not significant. The conclusions of the 36 Turbine Scheme assessment are unchanged in this regard.

5.5.38 In relation to cumulative collision risk for the golden eagle population within NHZ 10, the total estimated annual mortality from operational wind farms is 0.389. Taking into consideration proposed wind farm schemes (i.e. developments that have been approved but are yet to be

constructed and those in the planning process) this increases to 0.665 or one collision every c. 1.5 years (see Table 5.9). Approximately 45% of that precited mortality is assumed to affect the breeding population and 55% the non-breeding population. It is also important to note that in relation to non-breeding birds they have the potential to range well outside of the NHZ and, as a consequence, the collision risk will not apply exclusively to non-breeding birds that might be considered part of a nominal 'NHZ 10 population'.

5.5.39 Taking into consideration the findings from the recent golden eagle satellite tracking studies (as discussed above in relation to the assessment of displacement effects), which have confirmed that golden eagles display a strong avoidance behaviour of wind farms in Scotland (including avoidance by increasing flight height above the blade swept airspace), these are likely to be precautionary estimates of the true risk to the species. These studies cast some doubt on the continued applicability of the assumed avoidance rate used in the CRM (i.e. 99%, as recommended in current guidance[13]). The assumed avoidance rate is based on a study published in 2009[14], which recommended a precautionary rate of 99% (accounting for micro and macro-avoidance of turbines and wind farms) following an analysis of the results of monitoring studies at four wind farms in the USA. However, in the years since this avoidance rate was adopted, data from satellite tracking studies in Scotland has shown that golden eagle behaviour at wind farm sites in the USA does not appear to exhibit the same high degree of macro-avoidance apparent in the Scottish population.

5.5.40 For the Glenshero wind farm EIA (Simec Wind One Ltd and RES Ltd 2018, refused at Public Inquiry in 2022) a golden eagle population model (GEPM) was used to inform the assessment of the potential effects of collision mortality on the breeding population within NHZ 10. The level of annual collision risk from the Glenshero scheme assumed in the GEPM was 0.513. The results of the GEPM indicated that whilst there could be an adverse effect on the population growth rate, the favourable conservation status of the NHZ 10 breeding population would not be affected in the long-term. It is understood that NatureScot agreed with these conclusions at that time.

5.5.41 Given that the predicted cumulative mortality acting on the breeding golden eagle population is below the additional mortality assumed in the GEPM used to inform the assessment of the Glenshero scheme, and the caveats that should be applied to the accuracy of the CRM in the context of an over-precautionary 99% avoidance rate, it is considered reasonable to conclude the effect of the 29 Turbine Proposed Development, in combination with existing and proposed wind farms, would also not be significant in relation to the maintenance of favourable conservation status of the breeding golden eagle population within NHZ 10.

Waders - Monadhliath SSSI

5.5.42 The 29 Turbine Proposed Development and Stronelairg Wind Farm are located within 2km of the Monadhliath SSSI which is designated in part for the populations of golden plover, dunlin and dotterel that the area supports.

5.5.43 No potential effect on dotterel was reported from any of the published assessments for these projects, therefore cumulative effects on this species are assumed to be Negligible and not significant.

5.5.44 A small number of golden plover (c. 2) and dunlin (c. 1) territories were recorded within the SSSI boundary and within c. 500m of the 29 Turbine Proposed Development. This is a lower number than

[13] Scottish Natural Heritage (2018). Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model. September 2018 v2.

[14] Whitfield, D.P. (2009) Collision avoidance of golden eagles at wind farms under the 'Band' collision risk model. Report to SNH.

was the case for the 36 Turbine Scheme due to the removal of one of the turbines in the eastern cluster. Cumulative displacement effects acting on this number of breeding territories is considered unlikely to exceed the effect levels reported for the 36 Turbine Scheme. On a precautionary basis, a long-term effect of Minor, and not significant, is concluded for this receptor. The conclusions of the 36 Turbine Scheme assessment are unchanged in this regard.

Waders – Cumulative Operational Collision / Displacement Effects

5.5.45 There is uncertainty about the extent to which collision mortality is a potentially significant issue at the regional population level for waders. This is due to limitations in standard pre-construction survey methods and collision risk modelling and the lack of systematic and effective monitoring of collision fatalities at operational wind farms. However, the available evidence indicates that collision rates, at other than local scales, are unlikely to reach a level where biological relevant demographic effects are detectable for golden plover or dunlin.

5.5.46 Based on the available information for wind farm developments within NHZ 10, it is estimated that a maximum of 110 golden plover territories could be affected by operational displacement. Applying a highly conservative 80% effect this equates to a potential loss of 88 territories to an estimated breeding population of 2,702 pairs (Wilson *et al.* 2015[15]), which is 3.3% of the NHZ population. A more realistic worst case of a 50% reduction, which is still considered to be precautionary in view of the low apparent levels of operational displacement reported by some wind farm monitoring studies within the same NHZ (e.g. Farr Wind Farm, Fielding & Howarth 2013), would result in 55 territories being affected, which is 2.0% of the estimated NHZ breeding population. As discussed within the section of the assessment considering golden plover displacement, this outcome is likely to be an over-estimate of the actual level of effect but cannot be discounted based on the available scientific evidence. As the NHZ population is considered to be in unfavourable condition a precautionary assessment is that a potentially significant (Moderate) long-term cumulative operational displacement effect is possible as a result of the 29 Turbine Proposed Development at the NHZ 10 population scale. It should also be noted that, on the assumption that all of the other proposals in planning, considered in this assessment, were consented and built, potentially significant cumulative effects could occur irrespective of whether the 29 Turbine Proposed Development were to be consented and built. The conclusions of the 36 Turbine Scheme assessment are unchanged in this regard.

5.5.47 Based on the available information for wind farm developments within NHZ 10, it is estimated that a maximum of 45 dunlin territories could be affected by operational displacement. This represents 42.9% of the estimated NHZ 10 population (105 pairs, Wilson *et al.* 2015). Clearly, this is likely to be a significant over-estimate of the potential impact. Given that the wind farms considered in the cumulative assessment occupy only c. 10% of the NHZ 10 area it seems highly unlikely that half of the population would be located within these sites. Accepting that not all of the NHZ provides suitable breeding habitat for this species, there is still likely to be a large discrepancy between the available population estimate and the actual population size. Additionally, the evidence from wind farm monitoring studies is that this species is not particularly vulnerable to operational wind farm displacement. In one long-term study (at Farr Wind Farm) there was no evidence of any appreciable effect on the dunlin population from eight years of wind farm operation (Fielding & Howarth 2015b). On the assumption that at all sites best practice will be followed to minimise potentially significant short-term disturbance impacts on this species during construction an assessment of a Low (not

[15] Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504. pp72.

significant) long-term cumulative operational displacement effect at the NHZ 10 population scale is concluded for the 29 Turbine Proposed Development. The conclusions of the 36 Turbine Scheme assessment are unchanged in this regard.

5.5.48 Based on the available information for wind farm developments within NHZ 10, it is estimated that one greenshank territory could be affected by operational displacement. This represents about 10% of the estimated NHZ 10 population (10 pairs, Wilson *et al*. 2015). As is the case with dunlin, it is considered highly unlikely that the area of the 29 Turbine Proposed Development is the only site within the NHZ reporting the presence of breeding greenshank and occupying c. 0.56% of the NHZ area as a whole, support half of the NHZ population. Nonetheless, it is certainly possible that the one territory exceeds a nominal 1% threshold for regional (NHZ) importance. The available evidence from monitoring studies in Scotland is that this species is not particularly vulnerable to operational wind farm displacement or, with respect to flight activity away from breeding display locations, to collision mortality. The 36 Turbine Scheme avoided through the layout design process the main loci of breeding territory registrations (from 2019 and from other recent surveys). The 29 Turbine Proposed Development would further increase the distance from the proposed wind turbines to one of the key areas of greenshank breeding activity. A 'negligible' cumulative effect is considered to be a reasonable assessment at the national level, given the recognised ongoing uncertainties about potential displacement and collision mortality effects on greenshank, a Minor-Negligible long-term cumulative operational effect is concluded at the NHZ 10 population scale, for the 29 Turbine Proposed Development which is not significant. The 36 Turbine Scheme assessment reported a potential Minor long-term cumulative effect, which was not significant.

5.6 Conclusion

5.6.1 A review of the assessment of the 36 Turbine Scheme has been completed on the basis of the 29 Turbine Proposed Development (with seven turbines removed from the originally assessed layout). The assessment has considered the various potential adverse effects arising from the construction, operation and decommissioning of the 29 Turbine Proposed Development (in isolation and in combination with other wind farms) and evaluated the significance of these effects on key bird species (populations and their supporting habitats) in the context of the sensitivity of their populations, vulnerability to wind farm development and the scale of the potential effects.

5.6.2 A suite of measures were proposed in the EIA Report (April 2020) to avoid, reduce and offset potential effects on sensitive bird populations. These measures would apply to the 29 Turbine Proposed Development and have not been reduced in scope or extent due to the reduction in the size of the proposed wind farm.

5.6.3 Following consideration of a range of best practice and mitigation measures for the construction, operational and decommissioning phases of the 29 Turbine Proposed Development the residual effects for all receptors would be not greater than minor in the long-term and would not be significant in terms of the EIA Regulations. Although there would be some reduction in the potential magnitude of construction and operational related effects for some receptors the assessment has not concluded that there should be any change in significance level in comparison to the assessment of the 36 Turbine Scheme. In conclusion, the results of the assessment of the 36 Turbine Scheme are essentially unchanged for the 29 Turbine Proposed Development.

6. Hydrology and Hydrogeology

6.1 Introduction

6.1.1 Chapter 10 of the EIA Report (April 2020) evaluated the effects to Hydrology and Hydrogeology for the 36 Turbine Scheme, and was supported by the following Technical Appendices:

- 10.1: Groundwater Dependent Terrestrial Ecosystems Assessment;
- 10.2: Private Water Supplies Assessment; and
- 10.3: Watercourse Crossing Assessment.

6.1.2 The potential construction and operational effects identified were assessed and it was determined that, taking to account the application of standard mitigation measures as would be set out in the Construction Environmental Management Plan (CEMP) and anticipated requirements for the submission of an application for a Construction Site Licence to the Scottish Environmental Protection Agency (SEPA), residual effects on hydrology and hydrogeology would range from negligible to minor significance. These are not considered to be significant in the context of the EIA Regulations.

6.1.3 This Chapter considers the potential effects on the hydrological and hydrogeological environment associated with the construction, operation and decommissioning of the 29 Turbine Proposed Development, incorporating the removal of seven turbines and associated track infrastructure, when compared with the 36 Turbine Scheme layout, as assessed in Volume 2, Chapter 10: Hydrology and Hydrogeology of the EIA Report (April 2020). Such effects could include:

- Potential impacts on water quality (including both surface water and groundwater bodies) and assessment of risks from chemical pollution or sedimentation;
- Assessment of flood risk and the potential direct and indirect impacts of the 29 Turbine Proposed Development on flood risk at the site and potentially affecting land downstream;
- Impacts on flow regimes, water quality or the geomorphological characteristics of watercourses as a result of proposed watercourse crossings;
- The potential for the 29 Turbine Proposed Development to impact Groundwater Dependent Terrestrial Ecosystems; and
- Any alterations to regimes of water suppling Private Water Supplies in the locale of the 29 Turbine Proposed Development or within potential hydrological connection to the site.

6.2 Baseline Conditions

6.2.1 Site reconnaissance and surveying of watercourses was carried out in May 2019. There have not be any significant alterations to the hydrology of the Site, and subsequent ecological surveying of the site (as set out in **Technical Appendix 4.4**, 'Habitat Restoration Opportunities – Site Visit Report') indicates that reconnaissance of surface water features carried out in 2019 remains up to date. Additionally, review of desktop sources indicates that there are no alterations in the condition of surface water or groundwater resources. Therefore, there are no significant alterations baseline conditions at the site and assessment of the sensitivity of receptors at the site remains unchanged from the EIA.

6.3 Residual Effects

6.3.1 The 29 Turbine Proposed Development comprises the removal of Turbines 20, 21, 22, 23, 27 and 28 from the western cluster, Turbine 29 from the eastern cluster of the 36 Turbine Scheme and the

removal of associated track spurs that served these locations. In relation to the hydrology of the site, this includes the removal of two proposed crossings of Allt Creag Chornaich such that the 29 Turbine Proposed Development would include no new crossings of this watercourse (a revised schedule of watercourse crossings is provided in **Technical Appendix 6.1, Watercourse Crossing Schedule**). A crossing of Min Choire would also no longer be required for the 29 Turbine Proposed Development.

6.3.2 The 29 Turbine Proposed Development represents a reduction in the overall surface area of hardstand and track and therefore a reduction in the potential for alteration to existing hydrological conditions. The reduction in turbine numbers and track length shall have no effect on, or minor reduction in the potential for chemical pollution to the water environment, sedimentation and erosion, alteration to surface water flows or changes in flood risk to arise from the 29 Turbine Proposed Development. Therefore, in line with the EIA assessment, residual effects on hydrology and hydrogeology would range from negligible to minor significance. These are not considered to be significant in the context of the EIA Regulations.

6.3.3 The proposed approach that surface water runoff shall be accommodated by a Sustainable Urban Drainage System (SuDS), to be designed and implemented by the appointed contractor, remains suitable for the revised layout. SuDS measures shall be designed in line with the reduced impermeable surface area as a result of the reduction in the extent of site infrastructure.

6.3.4 The assessment of the potential effects on GWDTEs and PWS remains unchanged from the EIA.

6.4 Comparison of effects

6.4.1 The assessment of effects to Hydrology and Hydrogeology reported for the 36 Turbine Scheme remains the same for the 29 Turbine Proposed Development, i.e. the significance of all residual effects remains negligible to minor.

6.4.2 A reduction in the number of watercourse crossings is required for the updated layout. A summary of crossings required under the revised scheme is provided in **Appendix 6.1: Watercourse Crossing Schedule.**

7. Geology and Carbon Balance

7.1 Introduction

7.1.1 The EIA Report (April 2020) evaluated the effect to Geology and Carbon Balance for the 36 Turbine Scheme, based on assessments of effects to peat, soil and underlying geology. The potential construction and operational effects identified were assessed, and it was determined that specific mitigation measures would not be required as the significance of effect for all potential effects would be Minor or Negligible, i.e. not significant in terms of the EIA Regulations. As no specific mitigation measures were required, no residual effects on geology or soils would be associated with the 36 Turbine Scheme.

7.2 Assessment of Residual Effects

7.2.1 The change from the 36 Turbine Scheme to the 29 Turbine Proposed Development, with the removal of seven turbines and associated infrastructure, does not alter the overall conclusions of Chapter 11: Geology and Carbon Balance of the EIA Report (April 2020). The reduction in civil infrastructure will alter the peat and carbon balances predicted; however, as the result will be beneficial there is no requirement for further detailed assessment.

7.2.2 With regards to peat balance, the calculations set out in the Peat Management Plan (PMP; **Technical Appendix 7.1**) noted that there would be a surplus of peat, i.e. the maximum volume of peat that would be excavated for construction would be greater than the volume of peat required for restoration. However, it was determined that the surplus could be dealt with by locally increasing the thickness of deposited peat layer in borrow pits, as well as use within the proposed Habitat Management Area as described in the Outline Habitat Management Plan (**Technical Appendix 4.5**).

7.2.3 The volume of peat excavated for the 29 Turbine Proposed Development would be approximately 483,322m3 (a reduction of 78,756m3 from that reported in the PMP (**Technical Appendix 7.1**). The maximum volume of peat to be reinstated would be revised to 474,723m3, leaving a 'surplus' of 8,599m3. Similar to the 36 Turbine Scheme, this 'surplus' can be dealt with by locally increasing the thickness of deposited peat layer in borrow pits, as well as use within the proposed Habitat Management Area.

7.2.4 The total excavated volume of 483,322m^3 peat is estimated to comprise 120,831m^3 acrotelm and 362,492m^3 catotelm. After restoration is completed at all areas except for the borrow pits, the remaining peat comprises approximately 89,440m^3 acrotelm and 268,320m^3 catotelm.

7.2.5 The restoration of borrow pits can have a maximum restoration depth of 0.5m acrotelm peat overlying catotelm peat. Taking this into consideration with the remaining peat left over from the above, utilising maximum 0.5m acrotelm depth and adjusted catotelm depth of 1.65m, this would require 81,200m^3 acrotelm and 267,960m^3 catotelm.

7.2.6 The resulting difference would be a surplus of acrotelm 8,240m^3 (89,440m3 – 81,200m3) – this surplus can be accounted for by slightly increasing the depth of acrotelm used in other areas (see 7.2.7). For catotelm, the resulting difference would be a surplus of 360m^3 (268,320m^3 – 267,960m^3) which can easily be utilised by slightly increasing the depth of catotelm restoration in one borrow pit.

7.2.7 The acrotelm surplus of 8,240m^3 could also easily be utilised elsewhere during restoration works across the development. Such as, reuse within the proposed Habitat Management Areas.

7.2.8 Note that the above recalculations do not change the outcomes of the PMP as it currently stands, that all peat excavated will be utilised on site, and therefore does not affect the impacts assessed in the EIA Report (April 2020).

7.2.9 An updated version of the PMP included as an appendix to this Chapter, to reflect the changes in peat volumes as a result of the change in scope (see **Technical Appendix 7.1**).

7.2.10 With regards to carbon balance, the assessment carried out using the SEPA Carbon Calculator Tool, showed that the net emissions of carbon dioxide from the 29 Turbine Proposed Development are expected to reduce to 311,635 tonnes of CO2e. Also, the increase in peat restoration area increased the corresponding carbon gains. However, due to the reduced capacity, payback time of the project increased to 4.2 years. Full details on the results are available in **Technical Appendix 7.2**.

7.3 Comparison of Effects

7.3.1 While some of the underlying detail in terms of the amount of peat to be excavated and reinstated alter slightly, the assessment of effects reported for the 36 Turbine Scheme remains the same for the 29 Turbine Proposed Development, i.e. the significance of all residual effects remains negligible.

8. Cultural Heritage

8.1 Introduction

8.1.1 Chapter 12: Cultural Heritage of the EIA Report (April 2020) established the historic environment baseline for the site and assessed the potential for direct and setting effects on cultural heritage receptors which might result from the construction, operation, and decommissioning of the 36 Turbine Scheme. This assessment considers changes to the significance of effects as a result of the proposed changes to the Proposed Development set out in **Chapter 2: Revision to Proposed Development**.

8.1.2 Since the production of the EIA Report (April 2020), there have been no material changes to national and/or local legislation, planning policy or guidance in relation to cultural heritage which would affect the conclusions of the EIA Report (April 2020) or this assessment.

8.2 Assessment of Residual Effects

8.2.1 Following the proposed removal of Turbines 20, 21, 22, 23, 27, 28 and 29, and ancillary infrastructure, a re-assessment of the residual effects resulting from the 29 Turbine Proposed Development has been undertaken. This re-assessment assumes that the additional mitigation and enhancement measures outlined in Section 12.8 Mitigation and Technical Appendix 3.1, Section 11 of the EIA Report (April 2020) will be undertaken.

Construction

8.2.2 There have been no changes to the historic environment baseline within the site boundary since the production of the EIA Report (April 2020) and no significant residual construction effects were predicted therein (**Figure 8.1**).

8.2.3 Chapter 12: Cultural Heritage of the EIA Report (April 2020), noted that there was some potential for hitherto unknown buried archaeological remains and paleoenvironmental deposits to survive on site. The 29 Turbine Proposed Development would result in the amount of ground breaking within the site being reduced from that identified for the 36 Turbine Scheme, and thus the potential for impacting upon any surviving buried archaeological remains would also be somewhat reduced. The addition of nine turning points would constitute an additional requirement for ground breaking, however the 29 Turbine Proposed Development would to lead to a net reduction in the amount of proposed ground breaking overall when compared to the 36 Turbine Scheme. Mitigation measures set out in Section 12.8 and Technical Appendix 3.1 of the EIA Report (April 2020) would allow for the protection and preservation of known remains and allow for the recording of any archaeological remains encountered during construction. As such no significant residual direct effects are anticipated during construction. Therefore, there is no material change to the conclusion of the EIA Report (April 2020) where construction effects are concerned.

Operation

8.2.4 Direct effects upon any previously unknown archaeological remains which may be present on the site would cease with the completion of the groundworks stage of construction and there would be no direct effects during the operational phase of the 29 Turbine Proposed Development, this is unchanged from the EIA Report (April 2020).

8.2.5 Operational effects include the potential for impacts upon the setting of designated heritage assets within the 1km, 5km and 10km study areas set out in Chapter 12: Cultural Heritage of the EIA Report (April 2020). All designated heritage asset within the study areas and within the ZTV were subject to detailed assessment for the EIA Report (April 2020) (Technical Appendix 12.4 - Settings Assessment). All have been re-assessed in light of the proposal to remove Turbines 20, 21, 22, 23, 27, 28 and 29.

8.2.6 Examination of the revised ZTV (**Figure 8.2**) for this assessment has found that the Category A Listed Garvamore, Garva Bridge Over River Spey (St George's Bridge) (Site 17) will now lie outwith the ZTV and no turbines will be visible from the asset. The EIA Report (April 2020) predicted a negligible, and not significant, level of effect upon the setting this asset. Based on the 29 Turbine Proposed Development there would be no effect on the setting of the asset (Site 17).

8.2.7 For the other three designated heritage assets brought forward for assessment (see Table 12.4.1 in Technical Appendix 12.4, in the EIA Report (April 2020) there would be a reduction in the number of turbines visible from the assets. In the case of the Scheduled Dun-da-lamh, fort (Site 18); and the Category A Listed Garvamore "Barracks" (Site 16) the 29 Turbine Proposed Development also means that these assets are located at greater distances from the nearest proposed turbine.

8.2.8 The relative sensitivity of the Listed Barracks (Site 16) is judged to be Medium, the 29 Turbine Proposed Development considered to be a Marginal magnitude of impact resulting in a Neutral level of effect. The relative sensitivity of the Scheduled Dun-da-lamh, fort (Site 18) is considered to be High, the magnitude of impact Marginal and the overall level of effect Minor. Neither level of effect is considered to be significant in EIA terms.

Additional Mitigation

8.2.9 Mitigation proposals as outlined in Chapter 12: Section 12.8 and Technical Appendix 3.1 of the EIA Report (April 2020) remain valid and no additional mitigation measures are proposed.

Assessment of Cumulative Effects

8.2.10 The cumulative effects identified in Chapter 12: Section 12.10 of the EIA Report (April 2020) remain valid when considering the 29 Turbine Proposed Development. There would be no change in the levels of cumulative effect predicted.

Comparison of Effects

8.2.11 The 29 Turbine Proposed Development in comparison with the 36 Turbine Scheme would result in a net reduction in proposed ground breaking within the site. One asset (Site 17) would no longer be intervisible with the 29 Turbine Proposed Development and as such there would be no impact upon its setting. Overall, there would be a reduction in the number of turbines visible from assets considered under operational and cumulative effects in the EIA Report (April 2020). However, that reduction is not such that there would be a material change to the magnitudes of impact and levels of effect as predicted in the EIA Report (April 2020).

9. Traffic and Transport

9.1 Introduction

9.1.1 This 29 Turbine Proposed Development incorporates the removal of seven turbines (Turbines 20, 21, 22, 23, 27, 28 and 29) in comparison with the 36 Turbine Scheme. This Chapter considers the effects of the change to the assessment of Traffic and Transport effects set out in Chapter 13 of the EIA Report (April 2020) for the 36 Turbine Scheme, which concluded that neither construction nor cumulative residual impacts would result in significant effects.

9.2 Assessment of Residual Effects

9.2.1 The removal of seven turbines will require the delivery of fewer component parts and construction materials and so it is self-evident that the level of traffic impact will be reduced, relative to that presented in the EIA Report (April 2020) Chapter 13 for the 36 Turbine Scheme.

9.2.2 Furthermore, it will reduce the number of abnormal deliveries which will reduce the potential delays to general background traffic on the road network that can be caused by the movement of these outsized loads.

9.2.3 As the previously stated mitigation still applies, the findings of the EIA Report (April 2020) Chapter 13 for the 36 Turbine Scheme, set out below, remain valid:

The Proposed Development will lead to increased traffic volumes on sections of the A82, A87 and the B862 subject to the movements of construction traffic.

Fort Augustus was identified as a location of medium sensitivity, being an intermediate sized rural settlement, which is a popular tourist area with several facilities and services. The implementation of the specified CTMP is likely to reduce the impact on this community by construction traffic.

No significant construction effects were identified for the A82 or A87 as neither total nor HGV traffic flows are anticipated to increase by more than the relevant threshold of 30%.

During construction of the Proposed Development, total traffic movements may increase by more than 10% on the B862 to the west of the site access, a receptor of medium sensitivity. However, no significant construction effects were identified upon further assessment. Notwithstanding, mitigation measures are proposed to minimise conflict between construction traffic and all road users.

9.3 Comparison of Effects

9.3.1 While the 29 Turbine Proposed Development would lead to a reduction in the level of traffic impact during construction in comparison with the 36 Turbine Scheme, the reduction would not be enough to change the assessment of residual effects set out in the EIA Report (April 2020) Chapter 13 for the 36 Turbine Scheme.

9.3.2 In the context of the Cumulative Assessment, the Glenshero proposal has been refused while the layout for Dell proposal has been revised to incorporate fewer turbines of a larger size. As the baseline for the Cumulative Assessment will therefore have reduced traffic flows, it is self-evident that the overall traffic impact will be reduced when compared to that assessed in the 36 Turbine Scheme.

10. Socio-economics and Tourism

10.1 Introduction

10.1.1 The economic impacts of the construction, operation and decommissioning of the 29 Turbine Proposed Development have been estimated and assessed, using the same methodology as outlined in the EIA Report (April 2020) Chapter 14: Socio-economics and Tourism. The socio-economics baseline has been re-evaluated to account for changes since the production of the EIA Report (April 2020), however the changes are marginal, therefore do not change the sensitivity of the receptors as assessed.

10.1.2 The starting point for estimating the likely economic activity supported by the 29 Turbine Proposed Development is to consider the level of expected expenditure during the construction and development, operation and maintenance, and decommissioning phases, broken down into their main components. This is based on recent experience of similar developments. On this basis, it is possible to make reasonable assumptions on the values of contracts that would be available.

10.1.3 Based on the experience of comparable developments and an analysis of the structure of the Highland and Scottish economies (that is, the presence of suppliers and employees in relevant sectors), it is possible to make estimates of the amount of each component contract that could be secured by companies in Highland and Scotland.

10.1.4 There are two sources of economic activity: the first arising from each of the component contracts and the jobs they support; the second is from anticipated spending in the relevant study areas of people employed in these contracts (the income effect).

10.1.5 The economic and jobs impacts, including the wider income effects were calculated from expected contract values based on published economic statistics that provide details on turnover, employment and multiplier effects for the sectors of the economy relevant to the component contracts.

10.1.6 This methodology is well established in estimating the expected economic impacts of onshore wind developments and is described in more detail in the EIA Report (April 2020) Chapter 14: Socio-economics and Tourism.

10.2 Assessment of Residual Effects

Construction

10.2.1 The capacity of the 29 Turbine Proposed Development will depend on the turbine model and what is available at the time of construction. For the purposes of this Chapter, the socio-economic analysis has been based on 29 turbines with a total installed capacity of 125 MW. This assumes the same turbine generator size as outlined and assessed in the EIA Report (April 2020) Chapter 14: Socio-economics and Tourism. A development of this capacity would be estimated to have a capital cost of £156.3 million.

10.2.2 It is estimated that the economic impact associated with this expenditure (including the direct impact and the impact of staff spending) would be £20.4 million GVA and 290 years of employment in Highland, and £46.1 million GVA and 669 years of employment in Scotland.

10.2.3 The economic impact is marginally lower for the 29 Turbine Proposed Development than the 36 Turbine Scheme. However, the magnitude of economic and employment effects in Highland and

Scotland are similar and therefore the effects have been assessed as the same as the 36 Turbine Scheme, namely minor (beneficial) to the Highland economy and negligible (beneficial) to the Scottish economy.

Operation

10.2.4 It is estimated that the annual economic impact associated with operation and maintenance of the 29 Turbine Proposed Development (including the direct impact and the impact of staff spending) would be £1.1 million GVA and 12 jobs annually in Highland, and £2.0 million GVA and 20 jobs in Scotland.

10.2.5 The economic impact is marginally lower for the 29 Turbine Proposed Development than the 36 Turbine Scheme. However, the magnitude of economic and employment effects in Highland and Scotland are similar and therefore the effects have been assessed as the same as the 36 Turbine Scheme, namely negligible (beneficial) to the Highland and Scottish economies.

Decommissioning

10.2.6 The 29 Turbine Proposed Development would also have an economic impact during the decommissioning phase. Very few onshore wind projects to date have been fully decommissioned in the UK and, as a result, there is minimal data regarding the economic costs and impacts associated with this phase. Given that decommissioning activity would take place in future decades, it is difficult to predict what local economic conditions at that time would be. For these reasons, the decommissioning costs and impacts have not been quantified in this assessment.

10.2.7 The scale of the economic activity during the decommissioning phase would likely be less than that during the construction phase. The effects had been assessed as negligible (beneficial) for the 29 Turbine Proposed Development. The economic impact is likely to be only marginally lower than for the 36 Turbine Scheme and therefore the effects have been assessed as the same as the 36 Turbine Scheme.

10.3 Updated Community Benefit Fund Assessment

10.3.1 The potential community benefits and non-domestic rates associated with the 29 Turbine Proposed Development have been estimated using the same methodology and assumptions as for the 36 Turbine Scheme, but on the basis of an estimated 125MW capacity.

10.3.2 The scale of effect associated with a community benefit fund is dependent on the investment choices of the community. The effect of the community benefit fund was assessed as negligible (beneficial) for the 36 Turbine Scheme. The value of the fund associated with the 29 Turbine Proposed Development is unlikely to be greater and therefore the effects have been assessed as the same.

10.3.3 Based on consultations with those in the industry for recently commissioned wind farms, it was estimated that the annual payments are expected to be approximately £0.6 million annually, and £15.5 million over 25 years. This is lower than the estimated value in the EIA Report (April 2020) Chapter 14: Socio-economics and Tourism, and so the effect on the Highland economy has also been assessed as negligible (beneficial).

11. Land Use and Recreation

11.1 Introduction

11.1.1 The Land Use and Recreation Chapter (Chapter 15) of the EIA Report (April 2020) established a baseline for the site and assessed in detail the potential for likely significant effects on existing land uses and recreation receptors resulting from the construction and operation of the 36 Turbine Scheme. This chapter should be read in conjunction with the EIA Report (April 2020).

11.1.2 This assessment considers any changes to impacts assessed in Chapter 15 of the EIA Report (April 2020) as a result of the proposed changes associated with the 29 Turbine Proposed Development.

11.2 Assessment of Residual Effects

Land Use

11.2.1 Although there would still be both temporary and permanent loss of small areas of moorland for construction of the 29 Turbine Proposed Development, this would reduce as one less borrow pit, fewer hardstandings and turbine base excavations and less access tracks would be required overall.

11.2.2 These losses comprise relatively small areas within an expansive resource, and this land has already been influenced by structures for the operational Glendoe Hydroelectric scheme, Stronelairg Wind Farm and for estate management. As such, the conclusions of Chapter 15 of the EIA Report (April 2020) with respect to land use remain unchanged.

Recreation

11.2.3 Chapter 15 of the EIA Report (April 2020) concluded that the 36 Turbine Scheme would result in temporary, but significant effects to sections of three recreational routes (Scottish Hill Track 235, the Monadhliath Trail and the route to access the Corbett Carn a' Chuilinn) through conflict with construction of access tracks or their use by construction traffic. These effects were predicted to be temporary and short term, reducing to non-significant levels during operation of the 36 Turbine Scheme. However, the EIA Report (April 2020) confirmed that employment of mitigation measures, including a Draft Outdoor Access Management Plan, would ensure accesses to the existing walking routes are maintained while ensuring the safety of the public and construction staff.

11.2.4 The reduction in the number of turbines proposed as part of the 29 Turbine Proposed Development is unlikely to reduce the temporary or short term effects on Scottish Hill Track Route 235 (RoW HI109), the Monadhliath Trail or on the route to access the Corbett Carn a' Chuilinn in comparison to the 36 Turbine Scheme, albeit the reduction in turbine numbers could reduce the duration of short term effects. As such, the conclusions of Chapter 15 of the EIA Report (April 2020) would remain, in respect to effects on routes through the site (Scottish Hill Track Route 235 (RoW HI109) and the Monadhliath Trail), Moderate (and significant) during construction for the short sections of the routes that conflict with construction and their use by construction traffic, and Minor (not significant) during operation.

11.2.5 Other effects on recreational receptors, including the amenity effect on the South Loch Ness Trail and Loch Ness 360 Trail, would remain unchanged from the EIA Report (April 2020).

11.2.6 **Chapter 3: Landscape and Visual** of this Additional Information report details the anticipated changes to the visual effects associated with recreational routes and sites within the study area as a result of the 29 Turbine Proposed Development.

11.3 Cumulative Effects

11.3.1 Chapter 15 of the EIA Report (April 2020) concluded that the addition of the 36 Turbine Scheme to the cumulative baseline scenario is not anticipated to lead to any significant recreational cumulative effects. Minor (not significant) cumulative effects are anticipated for the Monadhliath Trail and Scottish Hill Track 235 (RoW HI109), both of which pass through the operational Stronelairg Wind Farm site, and close the revised Dell Wind Farm scoping layout. Both schemes would lead to an increased number of turbines which would be prominent in views from both walking routes and there is also potential for disruption to walkers, especially during the construction phase of each development. However, access management plans are proposed or listed as a condition of consent, for Dell, and an Outdoor Access Management Plan has been outlined for the 36 Turbine Scheme (see Technical Appendix 15.1 of the EIA (April 2020)) that remains applicable for the 29 Turbine Proposed Development. As such, there is no change to the conclusions of the EIA Report (April 2020) with respect to potential cumulative effects on land use or recreational receptors.

11.3.2 The landscape and visual amenity assessment provides an update to the assessment of potential cumulative effects on the landscape and visual receptors, including recreational routes (refer to Chapter 7: Landscape and Visual).

11.4 Conclusions

11.4.1 Despite the proposed reduction in turbine numbers, there would be no change to the conclusions of the levels of effect predicted in the EIA Report (April 2020) with respect to land use and recreation receptors.

12. Aviation

12.1.1 Chapter 16: Aviation, of the EIA Report (April 2020) concluded that the operation of the 36 Turbine Scheme would not result in any significant residual effects on military or civil aviation interests. The removal of 7 turbines is predicted to reduce the overall potential for effect, and as such the conclusions of Chapter 16 of the EIA Report (April 2020) remain unchanged.

13. Noise

13.1 Introduction

13.1.1 In order to consider the 29 Turbine Proposed Development (removal of T20, 21, 22, 23, 27 and 28 from the western cluster and Turbine 29 from the eastern cluster), the total cumulative noise predictions and the noise predictions from the 36 Turbine Scheme operating in isolation have been updated.

13.1.2 This Chapter should be read in conjunction with Chapter 17 of the EIA Report (April 2020) which remains valid. EIA Report (April 2020) Tables 6.4 and 6.6 have been updated to consider the 29 Turbine Proposed Development and a different candidate turbine (the GE 4.0-137 with standard blades and a hub height of 81.4 m) and the updated results are presented in **Tables 13.1** and **13.2**. The Total Noise Limits (which are noise limits which are applicable to all wind farms in the area) and the Site Specific Noise Limits (for the 29 Turbine Proposed Development only) are unchanged and are reproduced within **Tables 13.1** and **13.2**.

13.2 Consultation

13.2.1 An Environmental Health Officer (EHO) from The Highland Council provided a consultation response to the initial planning application (dated 12 February 2021) for the 36 Turbine Scheme. The Environmental Health Officer stated the following in relation to noise:

The turbine sites are a considerable distance to any noise sensitive properties however, with the increasing level of wind farm development in this area it is necessary for cumulative noise to be assessed. The applicant's EIA report has identified relevant site specific noise limits derived from the difference between overall limits and the predicted levels from other developments. The report demonstrates that that levels from this development will meet the proposed limits. I have no objection to the development subject to a condition restricting noise limits to no more than 2dB above predicted levels as per Table 17.6 of the EIA report.'

13.2.2 An updated set of predictions for the 29 Turbine Proposed Development operating in isolation are provided in **Table 13.2**.

13.3 Likely Effects

Updated Cumulative Noise Predictions

13.3.1 **Table 13.1** shows a comparison between the Total Noise Limit (TNL) and updated predicted cumulative wind turbine noise levels. **Table 13.1** shows the exceedance level which is the difference between the predicted wind turbine noise level and the TNL at a given wind speed. A negative exceedance level indicates satisfaction of the noise limit.

13.3.2 The results of the updated cumulative noise assessment show that the 29 Turbine Proposed Development can operate concurrently with the operational, consented and proposed (in planning) wind farm developments near to the Noise Assessment Locations (NALs), whilst still meeting the TNL established in accordance with ETSU-R-97 at the four NALs.

Table 13.1 - Compliance Table – Comparison of predicted cumulative noise levels (all schemes) against the TNLs at each receptor – All times of the day

Receptor		Wind Speed (ms^{-1}) as standardised to 10m height											
		1	2	3	4	5	6	7	8	9	10	11	12
NAL1 – Killin Lodge	Total ETSU-R-97 Noise Limit	38	38	38	38	38	38	38	38	38	38	38	38
	Predicted Cumulative Wind Turbine Noise L_{A90}	-	-	-	-	-	31.3	33.6	34	34	34	34	34
	Exceedance Level L_{A90}	-	-	-	-	-	-6.7	-4.4	-4	-4	-4	-4	-4
NAL2 – Crathie	Total ETSU-R-97 Noise Limit	35	35	35	35	35	35	35	35	35	35	35	35
	Predicted Cumulative Wind Turbine Noise L_{A90}	-	-	-	-	-	24.4	26.6	26.9	26.9	26.9	26.9	26.9
	Exceedance Level L_{A90}	-	-	-	-	-	-10.6	-8.4	-8.1	-8.1	-8.1	-8.1	-8.1
NAL3 - Garvabeg	Total ETSU-R-97 Noise Limit	35	35	35	35	35	35	35	35	35	35	35	35
	Predicted Cumulative Wind Turbine Noise L_{A90}	-	-	-	-	-	28.4	30.5	30.8	30.8	30.8	30.8	30.8
	Exceedance Level L_{A90}	-	-	-	-	-	-6.6	-4.5	-4.2	-4.2	-4.2	-4.2	-4.2
NAL4 - Melgarve	Total ETSU-R-97 Noise Limit	35	35	35	35	35	35	35	35	35	35	35	35
	Predicted Cumulative Wind Turbine Noise L_{A90}	-	-	-	-	-	27.9	30.1	30.5	30.5	30.5	30.5	30.5
	Exceedance Level L_{A90}	-	-	-	-	-	-7.1	-4.9	-4.5	-4.5	-4.5	-4.5	-4.5

13.3.3 The removal of T20, 21, 22, 23, 27, 28 and 29 has resulted in a maximum reduction in the predicted cumulative noise levels of 0.2 dB at NAL1, 0.5 dB at NAL2, 0.6 dB at NAL3 and 1 dB at NAL4.

Updated Site Specific Noise Predictions

13.3.4 The updated predictions from the 29 Turbine Proposed Development operating in isolation are presented in **Table 13.2**. The Site Specific Noise Limits (SSNL) were compared to the updated predictions from the 29 Turbine Proposed Development and the results are summarised in **Table 13.2**.

13.3.5 The assessment shows that the predicted wind turbine noise emission levels for the 29 Turbine Proposed Development meet the SSNL under all conditions and at all locations for both daytime and night-time periods at all receptors.

Table 13.2 - Compliance Table – Comparison of predicted noise levels from the 29 turbine Proposed Development against the SSNL at each receptor – At times of the day

Receptor		Wind Speed (ms^{-1}) as standardised to 10m height											
		1	2	3	4	5	6	7	8	9	10	11	12
NAL1 – Killin Lodge	Site Specific Noise Limit	35.0	35.0	35.0	35.0	35.0	35.0	33.5	32.7	32.7	32.7	32.7	32.7
	Predicted Wind Turbine Noise L_{A90}	-	-	7.8	9.8	14.6	18.6	21.4	21.8	21.8	21.8	21.8	21.8
	Exceedance Level L_{A90}	-	-	-27.2	-25.2	-20.4	-16.4	-12.1	-10.9	-10.9	-10.9	-10.9	-10.9
NAL2 – Crathie	Site Specific Noise Limit	35.0	35.0	35.0	35.0	35.0	34.4	33.9	33.8	33.8	33.8	33.8	33.8
	Predicted Wind Turbine Noise L_{A90}	-	-	3.6	5.6	10.4	14.4	17.2	17.6	17.6	17.6	17.6	17.6
	Exceedance Level L_{A90}	-	-	-31.4	-29.4	-24.6	-20	-16.7	-16.2	-16.2	-16.2	-16.2	-16.2
NAL3 - Garvabeg	Site Specific Noise Limit	33.8	33.8	33.8	33.8	33.8	32.9	31.0	30.5	30.5	30.5	30.5	30.5
	Predicted Wind Turbine Noise L_{A90}	-	-	5.9	8	12.8	16.8	19.5	19.9	19.9	19.9	19.9	19.9
	Exceedance Level L_{A90}	-	-	-27.9	-25.8	-21	-16.1	-11.5	-10.6	-10.6	-10.6	-10.6	-10.6
NAL4 - Melgarve	Site Specific Noise Limit	34.1	34.1	34.1	34.1	34.1	33.4	32.2	31.9	31.9	31.9	31.9	31.9
	Predicted Wind Turbine Noise L_{A90}	-	-	9.3	11.3	16.1	20.1	22.9	23.3	23.3	23.3	23.3	23.3
	Exceedance Level L_{A90}	-	-	-24.8	-22.8	-18	-13.3	-9.3	-8.6	-8.6	-8.6	-8.6	-8.6

13.3.6 The removal of T20, 21, 22, 23, 27, 28 and 29 has resulted in a maximum reduction in the predicted noise levels from the 29 Turbine Proposed Development only against the SSNL of 4.1 dB at NAL1, 4.6 dB at NAL2, 5.9 dB at NAL3 and 4.9 dB at NAL4.

Operational Effects

13.3.7 The effects of operational noise from the 29 Turbine Proposed Development against its own SSNL as reported in Chapter 17 of the EIA Report (April 2020) remain unchanged and are deemed not significant.

Cumulative Effects

13.3.8 The total predicted cumulative noise levels (from the 29 Turbine Proposed Development and other schemes (Stronelairg, Corriegarth, Dell and Glenshero) were found to meet the TNL at all receptors, therefore the effects of cumulative operational noise as reported in Chapter 17 of the EIA Report (April 2020) remain unchanged and as such no significant cumulative operational noise effects are predicted.

14. Schedule of Mitigation

14.1.1 The Schedule of Mitigation remains unchanged from Chapter 18: Schedule of Mitigation of the EIA Report (April 2020). For the avoidance of doubt, where Chapter 18: Schedule of Mitigation refers to the Deer Management Plan under items E3 and E4, this should be read as the updated Deer Management Plan included with this Additional Information (**Technical Appendix 4.6**). Furthermore, where Chapter 18: Schedule of Mitigation refers to the Outline Habitat Management Plan under item E19, this should be read as the updated Outline Habitat Management Plan included with this Additional Information (**Technical Appendix 4.5**).

15. Summary Changes to Residual Effects

15.1.1 The purpose of this chapter is to provide a summary of changes to the residual effects assessed in the EIA Report (April 2020), as a result of the reduced 29 Turbine Proposed Development after mitigation measures (described in **Chapter 14: Schedule of Mitigation**).

Table 15.1 Caption

Topic Area	Summary of Changes	Change
Landscape and Visual Amenity	Reduction in effects ratings for four Landscape Character Types, one Designated or Protected Landscape and seven Visual Receptors. Of these, one would also represent a reduction from a significant effect to a not significant effect from one visual receptor. In addition to this there would be widespread improvements to views from across the study area, (although these are not anticipated to lead to any changed effects ratings for other visual receptors).	Reduction
Ecology	The assessment does not predict any likely significant ecological residual effects on blanket bog habitats associated with the 29 Turbine Proposed Development. Therefore, the effects remain unchanged from the 36 Turbine Scheme.	No Change
Ornithology	Although there would be some reduction in the potential magnitude of construction and operational related effects for some receptors, the assessment has not concluded that there should be any change in significance level in comparison to the assessment of the 36 Turbine Scheme The results of the assessment of the 36 Turbine Scheme are essentially unchanged for the 29 Turbine Proposed Development, i.e. not greater than minor for all receptors in the long-term and not be significant in terms of the EIA Regulations.	No Change
Hydrology and Hydrogeology	The assessment of effects for Hydrology and Hydrogeology reported for the 36 Turbine Scheme remains the same for the 29 Turbine Proposed Development, i.e. the significance of all residual effects remains negligible to minor.	No Change
Geology and Carbon Balance	While some of the underlying detail in terms of the amount of peat to be excavated and reinstated alter slightly, the assessment of effects reported for the 36 Turbine Scheme remains the same for the 29 Turbine Proposed Development, i.e. the significance of all residual effects remains negligible	No Change
Cultural Heritage	Overall, there would be a reduction in the number of turbines visible from assets considered under operational and cumulative effects in the EIA Report (April 2020). However, that reduction is not such that there would be a material change to the magnitudes of impact and levels of effect as predicted in the EIA Report (April 2020).	No Change
Traffic and Transport	While the 29 Turbine Proposed Development would lead to a reduction in the level of traffic impact during construction in comparison with the 36 Turbine Scheme, the reduction would not be enough to change the assessment of residual effects set out in the EIA Report (April 2020) Chapter 13 for the 36 Turbine Scheme.	No Change
Socio-	The economic impact is marginally lower for the 29 Turbine	No Change

Topic Area	Summary of Changes	Change
Economics and Tourism	Proposed Development than the 36 Turbine Scheme. However, the magnitude of economic and employment effects in Highland and Scotland are similar and therefore the effects have been assessed as the same as the 36 Turbine Scheme.	
Land Use and Recreation	Despite the proposed reduction in turbine numbers, there would be no change to the conclusions of the levels of effect predicted in the EIA Report (April 2020) with respect to land use and recreation receptors, i.e temporary but significant effects from three routes during construction.	No Change
Aviation	The conclusions of Chapter 16 of the EIA Report (April 2020) remain unchanged. The operation of the 29 Turbine Proposed Development would not result in any significant residual effects on military or civil aviation interests.	No Change
Noise	The effects of operational noise from the 29 Turbine Proposed Development against those reported in Chapter 17 of the EIA Report (April 2020) remain unchanged and are deemed not significant.	No Change