Environmental Impact Assessment Report

Volume 1, Chapter 23: Terrestrial Ecology and Ornithology

MarramWind Offshore Wind Farm

December 2025

MarramWind

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Contents

23. Terrestrial Ecology and Ornithology

23.1 Introduction

23.1.1.1 This terrestrial ecology and ornithology Chapter of the Environmental Impact Assessment (EIA) Report presents the results of the assessment of the likely significant effects on 'Important Ecological Features' (IEFs) that may arise from the construction, operation and maintenance (O&M) and decommissioning of the onshore Project landward of Mean Low Water Springs (MLWS). It should be read in conjunction with the project description provided in **Chapter 4: Project Description** and the relevant parts of the following chapters and Appendices:

- **Chapter 9: Electromagnetic Fields:** Electromagnetic fields are considered in this chapter in respect to the potential impact pathways to salmonids including Atlantic salmon.
- **Chapter 12: Offshore and Intertidal Ornithology**: The offshore and intertidal ornithology assessment interlinks with terrestrial ecology and ornithology due to the presence of bird species that use both intertidal and offshore habitats.
- **Chapter 13: Fish Ecology**: This Chapter includes fish species that spend some of their life cycle within both inland waters and the marine environment. Therefore, there is potential for species to overlap between the onshore and offshore environment. Information from this Chapter has been used to inform the assessment on freshwater fish.
- **Chapter 20: Water Resources and Flood Risk**: The terrestrial ecology and ornithology assessment addresses potential impacts on designated sites. This Chapter has been informed by the conclusions of the assessment on the water environment which is a component of these designated sites. It is also informed by any specific water quality and / or quantity assessment of water-dependent habitats and species.

23.1.1.2 This Chapter describes:

- the legislation, planning policy, guidance and other documentation that has informed the assessment (**Section 23.2: Relevant legislative and policy context**);
- the outcome of consultation and engagement that has been undertaken to date, including how matters relating to terrestrial ecology and ornithology have been addressed (**Section 23.3: Consultation and engagement)**;
- the scope of the assessment for terrestrial ecology and ornithology (**Section 23.4: Scope of the assessment**);
- the data sources and methods used for gathering baseline data, including surveys where appropriate (**Section 23.5: Methodology for baseline data gathering**);
- the overall environmental baseline (**Section 23.6: Baseline conditions**);
- the basis for the EIA Report (**Section 23.7: Basis for the EIA Report**);
- methodology for the EIA Report (**Section 23.8: Methodology for the EIA Report**);
- the assessment of terrestrial ecology and ornithology effects (**Section 23.9: Assessment of effects: Construction stage; Section 23.10: Assessment of effects: Operation and Maintenance stage; Section 23.11: Assessment of effects: Decommissioning stage**);

- a summary of effects (**Section 23.12**: **Summary of effects**);
- consideration of transboundary effects (**Section 23.12: Transboundary effects**);
- consideration of inter-related effects and cumulative effects (**Section 23.14: Inter-related effects** and **Section 23.15: cumulative effects assessment**);
- a summary of residual effects for terrestrial ecology and ornithology (**Section 23.16: Summary of residual effects**);
- a reference list is provided (**Section 23.17: References**)**;** and
- a glossary of terms and abbreviations is provided (**Section 23.18**: **Glossary of terms and abbreviations**).

23.1.1.3 This Chapter is supported by the following Appendices in **Volume 3**:

- **Appendix 23.1: Ecological Desk Study**;
- **Appendix 23.2: Habitats and Vegetation Survey Report**;
- **Appendix 23.3: Protected Species Survey Report**;
- **Appendix 23.4: Breeding Birds Report 2023**;
- **Appendix 23.5: Breeding Birds Report 2024**;
- **Appendix 23.6: Winter Birds Report 2022/2023**;
- **Appendix 23.7: Winter Birds Report 2024/2024**;
- **Appendix 23.8: Screening rationale for assessment of important ecological and ornithological features**;
- **Appendix 23.9: Habitat Loss Calculations**; and
- **Appendix 23:10 Arboricultural Impact Assessment**.

23.1.1.4 This Chapter is supported by the following offshore consent application document:

- **Report to Inform Appropriate Assessment**: The terrestrial ecology and ornithology assessment addresses potential impacts on designated sites including the Loch of Strathbeg Special Protection Area (SPA) / Ramsar and qualifying features.

23.2 Relevant legislative and policy context and technical guidance

23.2.1 Legislative and policy context

23.2.1.1 This Section identifies the relevant legislation and policy context that has informed the scope of the terrestrial ecology and ornithology assessment. Further information on policies relevant to the EIA and their status is set out in **Chapter 2: Legislative and Policy Context**, which provides an overview of the relevant legislative and policy context for the Project. **Chapter 2: Legislative and Policy Context** is supported by **Volume 3, Appendix 2.1: Planning Policy Framework**, which provides a detailed summary of international, national, marine and local planning policies of relevance to the EIA.

23.2.1.2 Individual policies of specific relevance to this assessment and associated appendices have been taken into account. This summary provides a foundation for understanding the specific requirements that this Chapter must address in terms of assessing and mitigating impacts on features and relevant environmental issues.

23.2.1.3 The legislation policy and international agreements relevant to terrestrial ecology and ornithology include:

- The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) as transposed into Scottish law by:
  - The Conservation of Habitats and Species Regulations 2017 which apply in Scotland in relation to certain specific activities (reserved matters), including consents granted under section 36 or section 37 of the Electricity Act 1989. and
  - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) ("Habitat Regulations");

  Together known as the 'Habitats Regulations'.
- UK Post-2010 Biodiversity Framework (2012);
- Wildlife and Natural Environment (Scotland) Act 2011 (as amended);
- EC Directive (2009/147/EC) on the Conservation of Wild Birds (the 'Birds Directive');
- Nature Conservation (Scotland) Act 2004 (as amended);
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- Wild Mammals (Protection) Act 1996;
- The Protection of Badgers Act 1992 (as amended by the Nature Conservation (Scotland) Act 2004);
- The Convention on the Conservation of Migratory Species of Wild Animals (the 'Bonn Convention') 1983;
- Wildlife and Countryside Act 1981 (as amended);
- The Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention') 1979; and
- Convention on Wetland of International Importance especially as Waterfowl Habitat 1971 (the 'Ramsar Convention');

23.2.1.4 The policies relevant to terrestrial ecology and ornithology include:

- Biodiversity strategy to 2045: Tackling the Nature Emergency in Scotland;
- National Planning Framework 4 (NPF4) 2023;
- Aberdeenshire Council Natural Heritage Strategy 2019-2022;
- Scottish Biodiversity List (SBL) 2020; and
- North East Local Biodiversity Action Plan (NELBAP), 2012.

23.2.2 Relevant technical guidance

23.2.2.1 Other information and technical guidance relevant to the assessment undertaken for terrestrial ecology and ornithology include:

- NatureScot Developing with Nature Guidance (NatureScot, 2025);
- Scottish Environmental Protection Agency (SEPA) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems (SEPA, 2024);
- NatureScot standing advice for planning consultations - birds (NatureScot, 2022b) and protected species - otters (NatureScot, 2024);
- Scottish Government's Biodiversity: Draft Policy Guidance (Scottish Government, 2023a);
- Baseline Ecological Survey Planning advice (Aberdeenshire Council, 2023b);
- Securing Positive Effects For Biodiversity in new development (Aberdeenshire Council, 2023c);
- Chartered Institute of Ecology and Environmental Management (CIEEM) advice note on the lifespan of ecological reports and surveys (CIEEM, 2019);
- CIEEM Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland (CIEEM, 2018);
- Environmental Impact Assessment Handbook (Scottish Natural Heritage (SNH), 2018);
- Assessing connectivity with SPAs (SNH, 2016); and
- North East Local Biodiversity Action Plan (NELBAP) (Aberdeen City Council, 2012).

23.3 Consultation and engagement

23.3.1 Overview

23.3.1.1 This Section describes the consultation and stakeholder engagement undertaken on the Project in relation to terrestrial ecology and ornithology. This includes early engagement with stakeholders such as NatureScot, the outcome of and response to the Scoping Opinions Onshore Scoping Opinion (Aberdeenshire Council, 2023a) and Offshore Scoping Opinion (Scottish Government, 2023b) in relation to the terrestrial ecology and ornithology assessment, non-statutory consultation, and the findings of the Project's Statutory Consultation. An overview of engagement undertaken for the Project as a whole can be found in Section 5.5 of **Chapter 5: Approach to the EIA**.

23.3.2 Key issues

23.3.2.1 A summary of the key issues raised during statutory and non-statutory consultation, specific to terrestrial ecology and ornithology, is outlined below in **Table 23.1**, together with how these issues have been considered in the assessment.

Table 23.1 Stakeholder issues responses – terrestrial ecology and ornithology

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
NatureScot	14	9 August 2022 Response to meeting.	*"European sites including Loch of Strathbeg SPA/Ramsar and their qualifying interest features will require consideration as part of the EcIA and Habitats Regulations Appraisal (HRA) Screening assessments.* *Background and rationale behind the survey work in the EIA scoping report should be provided, particularly if there is any deviation from published guidance."*	Consideration of National Site Network (formerly referred to as European sites) within a potential Zone of Influence (ZOI) is presented in **Volume 3, Appendix 23.8**, this Chapter and separately within the Habitats Regulation Appraisal (HRA) Screening Report (MarramWind Limited, 2024) and **Report to Inform Appropriate Assessment**.
	15	16 September 2022 Response to survey updates.	*"Advise providing the background and rationale behind the ornithology survey methodology within the EIA Scoping Report, particularly if there is any deviation from published guidance."*	Rationale and methodology for over-wintering geese baseline surveys is presented within **Volume 3, Appendix 23.6** and **Volume 3, Appendix 23.7**.
	212	29 September 2022 Meeting.	*"NatureScot remarked that there may be some concern over the landfall envelope being too narrow and said that it would potentially be difficult to avoid the SPA due to geological and natural constraints."*	The landfall(s) location south of Peterhead, which is referred to at the NatureScot meeting in 2022 was designed out of the Project, favouring landfall options at Scotstown and Lunderton, avoiding proximity to the Buchan Ness to Collieston Coast SPA.
	516	12 May 2023 Scoping Opinion (Scottish Government, 2023b).	*"Sea trout support a number of fisheries in Scotland and many of these fisheries have undergone declines in the last 25 years. Note that juvenile Atlantic salmon and trout (including those that will become sea trout) can also be a host species for freshwater pearl mussel (FWPM)."*	Potential impacts to Atlantic salmon and sea trout are presented in **Volume 3, Appendix 23.8**; and assessed in **Sections 23.9** and **23.10.**

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	122, 123a, 123b	22 March 2023 Aberdeenshire Council's Scoping Opinion (Aberdeenshire Council, 2023a).	"***Protected areas*** • *Buchan Ness to Collieston Coast SPA – breeding seabirds* • *Bullers of Buchan Coast Site of Special Scientific Interest (SSSI) – coastal geomorphology, maritime cliff vegetation and breeding seabirds.* *These sites lie to the south of Peterhead with the SPA extending into Sandford Bay. There are inconsistencies in the scoping report regarding the assessment of impacts to breeding seabirds which are interests of these protected areas and it is not clear how they will be addressed within the EIAR. Chapter 6.5 (Terrestrial Ecology and Ornithology) scopes out impacts to qualifying interests of these sites as the features are considered within the assessment of offshore and intertidal ornithology. Chapter 5.7 (Offshore and Intertidal Ornithology) scopes in construction impacts for the landfall and offshore connection cables with relation to intertidal and nearshore ornithological receptors. However, this does not include the breeding colonies as this Chapter only covers land between mean high water and mean low water springs, or seawards. The cliffs used by breeding seabirds are above this tidal limit and so not included within the intertidal zone."* *"As there is the potential for significant disturbance to seabirds if construction works take place close to the cliffs/colonies during the breeding season we advise that the effects of increased human presence, noise and vibration and increased light levels are scoped in for the qualifying features of the Buchan Ness to Collieston SPA and the Bullers of Buchan SSSI.*	Potential impacts to breeding seabirds (including the breeding colonies), which are interests of Buchan Ness to Collieston Coast SPA and Bullers of Buchan Coast SSSI are considered within **Volume 3, Appendix 23.8**, and separately within the HRA Screening Report (MarramWind Limited, 2024).

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	124		*We note that further ornithological survey work may be required once the final cable connection corridor is selected.*"	Breeding bird surveys in 2023 and 2024 are presented in **Volume 3, Appendix 23.4** and **Volume 3, Appendix 23.5** respectively. Wintering bird surveys in 2023 / 2023 and 2023 / 2024 are presented in **Volume 3, Appendix 23.6** and **Volume 3, Appendix 23.7** respectively.
	127		"***Protected species and biodiversity*** *Other than the seabirds (comments given above), we generally agree with the scoping report's proposals in Chapter 6.5 Terrestrial Ecology and Ornithology namely target habitats, species, survey methodologies and embedded mitigation*."	Noted
	128		"*In carrying out survey work, any presence of invasive non-native species (INNS) should be noted and any necessary mitigation described in the EIAR*."	Habitat surveys are presented in **Volume 3, Appendix 23.2** and embedded environmental measures pertinent to INNS is presented in **Table 23.8**.
	131		"*We recommend the consideration of Positive Effects for Biodiversity / Biodiversity Gain and nature inclusive design aspects are identified at an early stage and recommend that the applicant and Aberdeenshire Council work together to explore such opportunities.*"	The Project acknowledges the importance of contributing positively to biodiversity and supports the principle of nature enhancement where feasible. Opportunities for biodiversity enhancement have been considered, and initial measures are outlined in the **Nature Positive Plan**. These measures will be further refined in consultation with stakeholders as the Project progresses.
	695a	19 July 2023 Response to meeting.	*"NatureScot guidance was being updated with respect to the use of habitat mapping and use of UKHABs in Scotland. Where National Vegetation Classification (NVC) is proposed, communities should correspond with*	Survey methodology, and baseline habitats and vegetation communities based on Phase 1 habitat and NVC surveys are presented alongside

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			terrestrial EUNIS classification (as used in the Habitat Map of Scotland). *NatureScot acknowledged that there would be limited locations of NVC as it will only be necessary in limited localised pockets and confirmed that guidance should be considered and interpreted accordingly per site."*	equivalent EUNIS codes in **Volume 3, Appendix 23.2**.
	913	21 January 2025 Response to update letter on 29 October.	"***Ecological enhancement / landscape enhancement opportunities*** *We generally will only provide advice on biodiversity enhancement in cases where impacts of the proposal raise or potentially raise issues of national interest. We appreciate the number cumulative developments in the area and encourage a wider strategy for enhancement as suggested. We recommend you explore opportunities with Aberdeenshire Council and consult the Local Biodiversity Action Plan for further information on potential enhancement opportunities*."	A **Nature Positive Plan** is provided as part of the Application, which outlines scope for positive effects for Biodiversity.
Aberdeenshire Council	673a	14 March 2023 Project meeting.	"*Aberdeenshire Council noted that in recent years increased pink-footed geese distribution has been found to the north of the study area.*"	Noted. Reference to historical data is considered within Wintering Bird Reports for 2022 / 2023 and 2023 / 2024 (**Volume 3, Appendix 23.6** and **Volume 3, Appendix 23.7** respectively).
	674		"*Aberdeenshire Council noted that freshwater pearl mussel has been recorded on stretches of the River Ugie.*"	Consideration of freshwater pearl mussel is presented in **Volume 3, Appendix 23.8**.
	675		"***Onshore Ecology and Ornithology Surveys*** *Aberdeenshire Council was in broad agreement with everything presented and had no concerns with any of the survey proposals outlined.*"	Noted.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	194	16 March 2023 Environment response to development management consultation.	"***Terrestrial Ecology and Ornithology*** *The proposed range of ecological surveys is comprehensive and covers the features that are potentially present within the study area. The project impacts for terrestrial ecology and ornithology that have been scoped into the EIA and the proposed approach to the assessments is acceptable.*"	Noted.
	65	22 March 2023 Aberdeenshire Council's Scoping Opinion (Aberdeenshire Council, 2023a).	*"A Habitat Management Plan should also be provided."*	**Volume 4, Outline Construction Environmental Management Plan** sets out details of the Outline Habitat Protection Plan and the Outline Species Protection Plan.
	69		"*The study area should be reviewed following refinement of the onshore aspects of development.*"	The study areas have been reviewed and refined over the development of the Project, as presented in **Section 23.4.2**.
	70		"*The Council's Environment Team (Natural Heritage) have reviewed the scoping report and are content that the proposed range of onshore ecological surveys are comprehensive, covering relevant features present within the study area. Those impacts scoped into the EIA and the proposed approach to the assessments are agreed to be acceptable.*"	Noted.
	71		*"NatureScot comments on the protected areas and protected species noted within the scoping report. In terms of protected areas, inconsistencies are noted regarding assessment of impacts of breeding seabirds (that are interests of the Buchan Ness to Collieston Coast SPA Bullers of Buchan Coast SSSI) and how they are to be addressed in the EIA Report. Chapter 6.5 (Terrestrial Ecology and Ornithology) scopes out impacts to qualifying interests, however Chapter 5.7*	Potential impacts to breeding seabirds (including the breeding colonies), which are interests of Buchan Ness to Collieston Coast SPA and Bullers of Buchan Coast SSSI are considered within **Volume 3, Appendix 23.8**, and separately within the HRA Screening Report (MarramWind Limited, 2024).

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			(Offshore and Intertidal Ornithology) scopes in construction impacts for the landfall. The cliffs used by breeding seabirds are not considered to be within the intertidal zone and should be considered a terrestrial feature. It is advised that effects of human presence, noise and vibration and increased light levels be scoped in for the qualifying features of the above named SPA and SSSI."	
	73		*"In terms of protected species and biodiversity, NatureScot are in general agreement with the proposals in Chapter 6.5 of the scoping report."*	Noted.
	74		*"It is recommended that any INNS be recorded and any mitigation required be described in the EIA Report."*	Habitat surveys are presented in **Volume 3, Appendix 23.2** and embedded environmental measures pertinent to INNS is presented in **Table 23.8.**
	75		*"Biodiversity Net Gain is a new feature within the LDP 2023 and forms part of NPF4. Consideration should be given to positive effects for biodiversity and nature inclusive design aspects should be identified early to include as part of the proposed development."*	A **Nature Positive Plan** is provided as part of the Application, which outlines scope for Positive Effects for Biodiversity.
	76		"*The Council agrees with the approaches indicated and does not suggest any other topics to those mentioned above in the NatureScot summary be altered.*"	Noted.
	687	27 June 2023 Project meeting.	"*The Project stated it has obtained remote sense aerial phase 1 data which has been useful for constraints mapping. The Project team have targeted more sensitive areas across the study area. Some areas would require further ground truthing. UK Habitat Classification (UKHABS) surveys are proposed to clarify*	Noted. Survey methodology, and baseline habitats and vegetation communities based on Phase 1 habitat and NVC surveys are presented alongside equivalent EUNIS codes in **Volume 3, Appendix 23.2**.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			what is there, what the assemblage is and what communities are there. The Project acknowledged NVC surveys may be appropriate for some small discrete areas. However, it was noted that there is limited potential in the study area for NVC surveys to be required and equality for Groundwater Dependent Terrestrial Ecosystems (GWDTE). Aberdeenshire Council agreed that they are not expecting extensive areas of NVC across the study area and confirmed that sounds acceptable."	
	795	16 September 2024, HRA Screening Request.	*"Dear Sir / Madam* *HRA Screening Request at MarramWind Offshore Wind Farm Development, Scotston, Lunderton Or Sanford Bay To Netherton Hub, Longside I refer to your request for a screening opinion for the above proposal received on the 20th August 2024.* *I am now in receipt of the necessary consultation responses and can offer a screening opinion under the Conservation (Natural Habitats, &c.) Regulations 1994. The 'HRA Screening Report MarramWind Offshore Wind Farm' (Doc. No. MAR-GEN-PMG-REP-WSP-000022, dated August 2024) provides information to inform the appropriate assessment and determine the need for further assessment. A review of this document, the accompanying appendices and consultation with relevant consultees informs the following response."*	Noted.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	796, 797, 798, 799	16 September 2024, HRA Screening Request.	"***HRA Screening Request*** *The submitted document is comprehensive and has considered whether the project is likely to have a potential Likely Significant Effect (LSE) on the qualifying interest of an extensive list of SPAs, Special Areas of Conservation and Ramsar Sites. It is agreed that further assessment is required, as set out in the screening document, to inform an appropriate assessment of effects, to accompany the planning application.* *Environment and Infrastructure Services – Natural heritage consider that the submitted HRA screening document is comprehensive and has considered whether the project is likely to have a potential Likely Significant Effect (LSE) on the qualifying interests* *As a result of the screening it is concluded that there is potential for likely significant effect (LSE) from the project on two sites in relation to intertidal ornithology and four sites in relation to onshore ornithology. It is proposed that these will be taken forward for further assessment and a report will be prepared to inform an appropriate assessment of the effects with the planning application. The conclusions appear to be acceptable however as these are sites of international importance then the views of Nature Scot should also be sought.* *NatureScot has commented that two sites have been taken forward for intertidal ornithological consideration and four sites have been taken forward for onshore ornithological consideration. We agree with the conclusions of the HRA screening report as summarised in table 8.1. Our advice is in relation solely to the onshore elements.*"	Noted. HRA Screening Report (MarramWind Limited, 2024) presents the screening of likely significant effects and the **Report to Inform Appropriate Assessment** takes likely significant effects through for further assessment.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			To summarise, further assessment is proposed and agreed by the Planning Service as set out in the submitted document 'HRA Screening Report MarramWind Offshore Wind Farm' (Doc. No. MAR-GEN-PMG-REP-WSP-000022, dated August 2024) as submitted with this screening request.	
	875	19 December 2024, Aberdeenshire Council Pre-Application Report (Aberdeenshire Council, 2024)	"Impact on habitats": *SEPA have identified nationally water courses with riparian planting opportunities and these may provide an opportunity for environmental enhancement within or associated with development sites. The Riparian Planting Opportunities data layer can be accessed from SEPAs web page - https://www.sepa.org.uk/environment/environmental-data/* *The following are highlighted within the redline boundary:* *- River Ugie - has been identified with medium to high potential for riparian planting* *- Burn of Faichfield - has been identified with medium to high potential for riparian planting.* *- Burn of Faichfield - has been identified with medium to high potential for riparian planting.*	Noted. A **Nature Positive Plan** is provided as part of the Application, which outlines scope for Positive Effects for Biodiversity.
	874		*Impact on trees:* *Planning Service* *Potential impact on trees is unknown at this stage due to the unknown, landfall site, cable route and substation site. More information would be required to assess impacts on trees/woodland. However, it should be noted that should compensatory planting be required, the*	An Arboricultural Impact Assessment is provided in **Volume 3, Appendix 23.10**.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			Planning Service would require details to be provided on submission of the PPP application.	
	876		*Impact of protected species and ornithology:* *Natural Environment Team* *"The ecological and ornithological surveys that have been carried out are comprehensive both in terms of the range of surveys and the number of years of survey work carried out. This will provide a solid baseline of data to inform the EIA and HRA and there are no further comments on this at this time."*	Noted.
	877		*Carbon and peat:* *Comments from SEPA* *"Where proposals are on peatland or carbon rich soils (CRS), the following should be submitted to address SEPA's requirements in relation to NPF4 Policy 5 to protect CRS and the ecosystem services they provide (including water and carbon storage)."*	An ecological desk study is presented in **Volume 3, Appendix 23.1** that illustrates no peatland or carbon rich soils within the Onshore Red Line Boundary. Baseline Phase 1 habitat and NVC surveys are presented in **Volume 3, Appendix 23.2**.
	878		*Biodiversity enhancement:* *Natural Environment Team* *"The need for nature-based solutions and biodiversity enhancement has been identified within the Nature Positive Strategy. It is noted that this has been intended as a project-wide document and therefore includes both the offshore and onshore elements of the development. In relation to the onshore elements, the approach outlined within document is acceptable. It is intended to submit a Nature Positive Plan with the application for permission and this would include details of implementation as well as monitoring. The approach and principles that have been outlined are acceptable in relation to the onshore part of the development."*	A **Nature Positive Plan** is provided as part of the Application, which outlines scope for Positive Effects for Biodiversity.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	883		*Waste Management:* *<u>SEPA</u>* *"If forestry is present on the site, the site layout should be designed to avoid large scale felling, as this can result in large amounts of waste material and a peak in release of nutrients which can affect local water quality. The submission must include drawings with the boundaries of where felling will take place and a description of what is proposed for this timber in accordance with Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance from SEPA, SNH and FCS"*	An Arboricultural Impact Assessment is provided in **Volume 3, Appendix 23.10.**
Royal Society for Protection of Birds (RSPB)	16	27 September 2022, Meeting	*"RSPB request to see the year 1 data following completion of over-wintering geese surveys. "*	Year 1 data was provided at the time.
	681	12 June 2023, Response to post scoping workshop.	"*RSPB were sent the ornithological method statement that sets out the approach to breeding and wintering bird surveys.* *RSPB responded that they would not be able to provide comment on method statements and that if they align with published NatureScot guidance, they are unlikely to hold an object."*	Noted. Surveys align with published NatureScot guidance and are presented within **Volume 3, Appendix 23.4**, **Appendix 23.5**, **Appendix 23.6** and **Appendix 23.7**.
Ugie District Salmon Fishery Board	854	5 November 2024, HRA Screening response.	*"The UDSFB would like to know what the Marram Wind Farm project is going to do to make sure that during the construction of the project and during its lifetime, that there will be no adverse effect to the resident juvenile salmon and sea trout in the River Ugie and when they are migrating to feeding ground in the sea. The Ugie District Salmon Fishery Board have a statutory duty to*	Potential impacts to Atlantic salmon and sea trout are presented in **Chapter 13: Fish Ecology, Chapter 23: Terrestrial Ecology and Ornithology** and **Volume 3, Appendix 23.8**.

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
			protect and enhance the populations of salmon and sea trout in the River Ugie."	
	914	16 July 2025. Email response to letter.	"*Ugie salmon fishery board members have concerns regarding the cumulative effect of the number of high voltage cables crossing burns and the River Ugie, and the negative effect they may have on the populations of salmon and seatrout in the river*."	
Marine Directorate – Licensing Operations Team (MD-LOT)	376	12 May 2023 MD LOT Scoping Opinion (Scottish Government, 2023b).	*"The Scottish Ministers advise in line with the NatureScot representation that the impact of climate change effects should be considered, both in futureproofing the project design and how certain climate stressors may work in combination with potential effects from the Proposed Development. The Scottish Ministers also highlight the comments from NatureScot concerning the consideration of Positive Effects for Biodiversity / Biodiversity gain as well as nature-inclusive design aspects at an early stage of the project's design."*	Future baseline consideration of effects of climate change is considered in **Section 23.6.2**. The Project acknowledges the importance of contributing positively to biodiversity and supports the principle of nature enhancement where feasible. Opportunities for biodiversity enhancement have been considered, and initial measures are outlined in the **Nature Positive Plan**. These measures will be further refined in consultation with stakeholders as the Project progresses.
	451	12 May 2023 MD LOT Scoping Opinion (Scottish Government, 2023b).	*"Positive Effects for Biodiversity/ Biodiversity Net Gain:* *We recommend both the consideration of Positive Effects for Biodiversity/ Biodiversity Gain as well as nature inclusive design aspects at an early stage and can provide further information if required, whilst not policy as part of our ability to address both the climate and biodiversity crises we encourage developers to consider this as part of their application."*	

Stakeholder	Stakeholder issue ID	Date, document, forum	Stakeholder comment	How is this addressed in the EIA Report
	802	5 November 2024 HRA Screening Response.	*Diadromous fish:* *"With regards to the qualifying features to be considered, MD-LOT acknowledges section 5.1 of the screening report and agrees that diadromous fish should be screened out from the HRA and instead must be considered through the Environmental Impact Assessment ("EIA") Report for the Proposed Development. Furthermore, MD-LOT advises that the impacts on diadromous fish, as outlined in the FMS and Ugie DSFB representations, should be considered further as part of the EIA Report."*	Potential impacts to Atlantic salmon and sea trout are presented in **Volume 3, Appendix 23.8**.

23.4 Scope of the assessment

23.4.1 Overview

23.4.1.1 This Section sets out the scope of the EIA for terrestrial ecology and ornithology. This scope has been developed as the Project's design has evolved and responds to stakeholder feedback received to-date, as set out in **Section 23.3**.

23.4.2 Spatial scope

23.4.2.1 The spatial scope of the terrestrial ecology and ornithology assessment is defined as a collection of study areas appropriate ZOIs, which have formed the basis of the study area described in this Section.

Study area

23.4.2.2 The study area for the terrestrial ecology and ornithology assessment encompasses the land above Mean High Water Springs (MHWS), which comprises the area over which all desk-based and field data has been gathered to inform the terrestrial ecology and ornithology assessment presented in this Chapter. It should be noted that **Chapter 12: Offshore and Intertidal Ornithology** and **Chapter 10: Benthic, Epibenthic and Intertidal Ecology** both provide coverage for the 'intertidal' zone of the study area between MLWS and MHWS for ecological and ornithological features utilising these habitats. Associated effects will be considered for these features within this zone in these respective chapters. Due to the presence of multiple ecological features[1] and many potential effects, the level and type of data collection varies across several different study areas detailed below.

23.4.2.3 These 'study areas' (as shown on **Volume 2, Figure 23.1**: **Ecological study areas**); comprise:

- all land within the Onshore Red Line Boundary:
  - the desk study areas for sites designated for their nature conservation interest at the international, European, national and local levels;
  - the study area for legally protected and notable ecological features;
  - the study area for any legally controlled species; and
  - the initial Scoping Boundary provided the study area within which initial wintering geese surveys were undertaken in 2022 / 2023.
- the Proposal of Application Notice Boundary was the study area within which breeding bird surveys were undertaken in 2023 / 2024; and wintering geese surveys were undertaken in 2023 / 2024.

23.4.2.4 The extent of the areas of search were determined based on best practice guidance (see **Table 23.5**) a high-level overview of the types of ecological features present, and the potential effects that could occur. The study areas were defined on a precautionary basis to ensure that the ZoI relevant to all ecological features (as detailed in **Table 23.5** and **Table 23.6**) were covered during baseline data collection activities.

[1] 'Ecological feature' is used within EcIA published by the CIEEM (2018) in place of the term 'terrestrial ecology receptor'. The term ecological feature is used throughout this Section.

23.4.2.5 The zones for considering the baseline condition within are shown on **Volume 2, Figure 5.1: Onshore Red Line Boundary (zones)**:

- Scotstown landfall and associated onshore export cable corridor;
- Lunderton North landfall and associated onshore export cable corridor;
- Lunderton South landfall and associated onshore export cable corridor;
- onshore export cable corridor zone A;
- onshore substation zone; and
- onshore export cable corridor zone B.

23.4.3 Temporal scope

23.4.3.1 The temporal scope of the terrestrial ecology and ornithology assessment is the entire lifetime of the Project, which therefore covers the construction, O&M, and decommissioning stages.

23.4.3.2 It is anticipated that the construction of the Project will commence in 2030, with the first phase becoming fully operational by 2037. It is anticipated that the second phase of the Project would become fully operational by 2040 and the third phase by 2043. The operational lifetime of the Project for each phase is expected to be 35 years.

23.4.4 Identified features

23.4.4.1 The spatial and temporal scope of the assessment assists in the identification of features that may experience a change as a result of the Project. The features identified as IEFs that may experience likely significant effects for terrestrial ecology and ornithology are outlined in **Table 23.2**.

Table 23.2 Identified IEFs requiring assessment for terrestrial ecology and ornithology

Feature group	IEF included within group
Designated sites	• Loch of Strathbeg SPA / Ramsar – Pink-footed goose and whooper swan (non-breeding); and • Rattray Head to Peterhead Local Nature Conservation Site (LNCR) – sand dune communities and wintering bird assemblage.
Protected species	• otter; • badger; • bats; and • freshwater fish (Atlantic salmon and sea trout).
Habitats	• Ancient woodland.

23.4.4.2 This is based on information summarised in **Table 23.3** which identifies the potential effects on terrestrial ecology and ornithology IEFs that have been scoped in for assessment.

23.4.5 Identified IEFs and potential effects

23.4.5.1 IEFs of sufficient importance occurring within a relevant ZoI are reported in **Table 23.3** along with a summary rationale behind their inclusion. For each IEF presented, the potential environmental changes and potential significant effects resulting from the Project are provided.

Table 23.3 Potential effects for terrestrial ecology and ornithology, ZOIs and justification for scoped-in features

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
Construction and decommissioning stages						
Loch of Strathbeg SPA / Ramsar: Pink-footed goose and whooper swan	International	County / Council area.	Land take / land cover change during construction at the landfall(s) and onshore export cables.	Loss of functionally linked[2] non-designated habitat supporting pink-footed geese, associated with Loch of Strathbeg SPA / Ramsar.	Within the Onshore Red Line Boundary.	During winter geese and swan surveys in 2022 / 2023 (**Volume 3, Appendix 23.6**) and 2023 / 2024 (**Volume 3, Appendix 23.7**), pink-footed geese were recorded throughout the winter in significant numbers (peak counts of >1% of the SPA population) utilising agricultural land to the south of St Fergus Gas Terminal and surrounding fields within a ZOI of the Onshore Red Line Boundary at Scotstown Landfall. Whooper swan were recorded on only two occasions during two years of winter survey, but on one occasion a peak count of ~12% of the SPA population in the at the Scotstown landfall. On this basis, there are potential impact pathways in terms of disturbance effects to pink-footed
			Increased human presence, noise and vibration, and increased light levels during construction at the landfall(s) and onshore export cables.	Potential for disturbance and displacement effects leading to loss of foraging habitat during winter months.	Within 500 metres (m) of the Onshore Red Line Boundary.	

[2] 'Functionally linked land' is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Areas of Conservation (SAC) / SPA / Ramsar site has been designated. These habitats are frequently used by SPA species and supports the functionality and integrity of the designated sites for these features.

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
						geese and whooper swan resulting in temporary displacement / loss of functionally linked habitat during the construction stage.
Rattray Head to Peterhead LNCS: Winter bird assemblage	County / Council area	County / Council area	Land take / land cover change during construction at the landfall(s) and laydown of onshore export cables.	Loss of habitat supporting wintering bird assemblage.	Within the Onshore Red Line Boundary.	The Rattray Head to Peterhead Local Nature Conservation Site (LNCS) and adjacent agricultural fields are important for roosting and feeding geese, waders and wildfowl. Winter geese and swan surveys undertaken in 2022 / 2023 (**Volume 3, Appendix 23.6**) and 2023 / 2024 (**Volume 3, Appendix 23.7**) confirmed the presence of the following species: curlew, lapwing, golden plover, snipe, redshank, oystercatcher and jack snipe. The St Fergus landfall within the vicinity of Annachie Burn / South Scotston overlaps a large area of LNCS supporting a wintering waders and wildfowl.
			Increased human presence, noise and vibration, and increased light levels during construction at the landfall(s) and onshore export cables.	Potential for disturbance and displacement effects leading to loss of foraging habitat during winter months.	Within 500m of the Onshore Red Line Boundary.	
Rattray Head to Peterhead LNCS: Sand dune communities	County / Council area	County / Council area	Temporary and permanent land take / land cover change during construction at the landfall(s) and onshore export cables.	Potential for direct habitat loss (including both permanent and temporary loss or damage of habitat).	Within the Onshore Red Line Boundary.	Sand dune communities, which are Annex I habitats (listed in the Habitats Directive) are situated along the coastline within the Onshore Red Line Boundary.

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
			Introduction of INNS.	Potential for accidental introduction of INNS leading to degraded vegetation communities.	Within the Onshore Red Line Boundary.	
			Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall, onshore export cables and onshore substations. This includes the potential for breakout and leakage of bentonite during trenchless crossing.	Potential for accidental contamination entering watercourses or groundwater, leading to degraded vegetation communities.	Within hydrological connectivity of the Onshore Red Line Boundary.	
Ancient woodland	National	Regional	Temporary and permanent land take / land cover change during construction at onshore export cables.	Potential for direct habitat loss (including both permanent and temporary loss or damage of habitat).	Within 15m of the Onshore Red Line Boundary.	No legislation specifically protects ancient woodland. However, NPF4 considers that ancient semi-natural woodland is an irreplaceable resource and, along with other woodlands, hedgerows and individual trees, especially veteran trees of high nature conservation and landscape importance, should be protected from adverse impacts resulting from development. Ancient woodland is present along the River Ugie, within the Onshore Red Line Boundary.
			Introduction of INNS.	Potential for accidental introduction of INNS leading to degraded vegetation communities.	Within the Onshore Red Line Boundary.	

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
Otter, badger	International Local	Local	Temporary and permanent land take / land cover change during construction at the landfall(s) and onshore export cables.	Potential for direct habitat loss (including both permanent and temporary loss or damage of habitat) or inadvertent damage to breeding sites, or resting places.	Within the Onshore Red Line Boundary.	Otter is a European Protected Species (EPS) and an SBL Priority species. No otter resting sites were recorded within the ZOI of the Onshore Red Line Boundary. However, the Project is within the home range of otters and therefore construction activity may disturb individuals and there may be impacts to their prey species – either from the placement of infrastructure or due to noise disturbance. Badgers and their setts are protected in Scotland under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. Six badger setts were recorded within the Onshore Red Line Boundary and habitat suitable for sett creation is available across this area.
				Fragmentation of habitats or temporary severance of habitat and commuting routes.		
			Increased human presence, noise and vibration, and increased light levels during construction stage.	Potential for disturbance and displacement effects.	Up to 30m beyond the Onshore Red Line Boundary.	
			Use of plant machinery / vehicles during construction at the landfall(s), laydown of onshore export cables and onshore substations.	Potential for injury or direct mortality (loss of life to habitats or species through direct contact.	Within the Onshore Red Line Boundary.	
Bats	International	Local	Artificial Light at Night (ALAN)	Potential for disturbance and displacement effects.	Up to 30m beyond the Onshore Red Line Boundary.	As EPS, all bat species found in Scotland are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as
			Works affecting roosts / roosting bats			

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
			Temporary and permanent land take / land cover change during construction at onshore export cables.	Loss of roost resources (i.e. Potential Roost Features (PRFs).	Within the Onshore Red Line Boundary.	amended); and are SBL priority species. Suitable foraging and commuting habitat was found across the Onshore Red Line Boundary, including watercourses, woodland edges and hedge lines. Most woodland recorded comprised conifer plantation, which generally present fewer opportunities for bat species, however smaller parcels of mature, broadleaved woodland provide opportunities for roosting bats. Nine trees that have Bat Roost Potential (BRP), in particular, the woodland along the River Ugie were subject to Preliminary Roost Assessment (PRA).
				Severance of suitable foraging habitat		
				Potential for injury or direct mortality (loss of life to habitats or species through direct contact.		
Freshwater fish	National	Local	Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall(s), onshore export cables and onshore substations. This includes the potential for breakout and leakage of bentonite during trenchless crossing.	Potential for injury or direct mortality (loss of life to habitats or species through pollution events).	Within hydrological connectivity of the Onshore Red Line Boundary.	Atlantic salmon is protected under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 and is an SBL priority species. The River Ugie is a known salmonid migration routes within the Onshore Red Line Boundary.

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
Operation and maintenance stage						
Loch of Strathbeg SPA / Ramsar: Pink-footed goose and whooper swan	International	County / Council area	Increased human presence, noise and vibration, and increased light levels during the operational stage at the landfall(s) and onshore export cables.	Potential for disturbance and displacement effects leading to loss of foraging habitat during winter months.	Within 500m of maintenance areas within Onshore Red Line Boundary.	As for construction stage; however, impact pathways will be much reduced given the lower levels of activity and only occasional human presence.
Rattray Head to Peterhead LNCS: Winter bird assemblage	County / Council area	County / Council area	Increased human presence, noise and vibration, and increased light levels during construction at the landfall(s) and onshore export cables.	Potential for disturbance and displacement effects leading to loss of foraging habitat during winter months.		
Rattray Head to Peterhead LNCS: Sand dune communities	County / Council area	County / Council area	Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall(s), onshore export cables and onshore substations. This includes the potential for breakout and leakage of bentonite during trenchless crossing.	Potential for accidental contamination entering watercourses or groundwater, leading to degraded vegetation communities.	Within hydrological connectivity of the Onshore Red Line Boundary.	
Ancient woodland	National	Local				

IEF	Importance – legislation and policy	Importance – Project	Activity or impact	Potential effect	ZOI	Relevant assessment criteria and scoped in justification
Otter, Badger, bats	International Local Local	Local Local Local	Operational activities such as vehicular traffic and maintenance works.	Potential for injury or direct mortality (loss of life to habitats or species through direct contact.	Up to 30m beyond maintenance areas (based on NatureScot protected species advice).	
Freshwater fish	National	Council area	Electromagnetic fields (EMF) on fish.	Potential for disturbance or changes to fish behaviour from EMF.	Watercourse crossings.	Watercourses supporting fish populations within connectivity of Project.

23.4.6 Effects scoped out of assessment

23.4.6.1 A single potential effect has been scoped out from further assessment, resulting from a conclusion of no likely significant effect. These conclusions have been made based on the knowledge of the baseline environment, the nature of planned works and professional judgement. The scoped-out activity or impact is summarised in **Table 23.4**.

Table 23.4 Activities or effects scoped out of assessment

Activity or impact	Rational for scoping out
Air quality effects to designated nature conservation sites during all stages, resulting from vehicle and plant emissions	Changes in concentrations and deposition rates of nitrogen resulting in habitat degradation have been scoped out for designated sites including SPAs / Ramsar sites / Special Area of Conservation (SACs) and SSSIs. All designated sites are >4km from the Onshore Red Line Boundary and outside a potential ZOI.

23.4.7 Ecological features scoped out of assessment

23.4.7.1 Features were scoped out of the assessment at this stage because they were considered not important enough to warrant further consideration or because they would not be significantly affected. This approach is consistent with that described in CIEEM (2018). Specific justification for exclusion of each of these ecological features is provided in **Volume 3, Appendix 23.8**.

23.4.7.2 Following the systematic scoping rationale presented in **Volume 3, Appendix 23.8**, the following ecological features have been scoped out of further assessment based on no or limited evidence of presence, their distance from the Onshore Red Line Boundary and / or no identified impact pathways:

- Designated sites: Loch of Strathbeg SPA / Ramsar / SSSI (all qualifying interest features with the exception of pink-footed goose and whooper swan); Buchan Ness to Collieston Coast SPA (all qualifying features); Buchan Ness to Collieston SAC (all qualifying features); Ythan Estuary, Sands of Forvie and Meikle Loch SPA / Ythan Estuary and Meikle Loch Ramsar (all qualifying features); and Rora Moss SSSI.
- Habitats: Broadleaved plantation woodland (not ancient woodland); mixed plantation woodland; conifer plantation; arable fields, marshy grassland, semi-improved grassland, poor semi-improved grassland, improved grassland, hedgerows and scrub.
- Protected and notable species: pine marten, brown hare, red squirrel, amphibians (great crested newt, common newt, palmate newt, common toad and common frog), reptiles (common lizard, slow worm and adder).

23.4.7.3 It is important to note, however, that whilst effects and features are scoped out because there is no potential for a significant effect in EIA terms, the need to ensure compliance with nature conservation legislation still applies. The presence and potential presence of all species within the Onshore Red Line Boundary will require consideration within the Construction Environmental Management Plan (CEMP), as well as the discharge of planning conditions, which will include appropriate measures that may be necessary to ensure legislative compliance.

23.5 Methodology for baseline data gathering

23.5.1 Overview

23.5.1.1 Baseline data collection has been undertaken to obtain information for the study area described in **Section 23.4**. The current and future baseline conditions are presented in **Section 23.6.**

23.5.2 Desk study

23.5.2.1 The data sources that have been used to inform this terrestrial ecology and ornithology assessment are summarised in **Table 23.5**. Further details are provided in **Volume 3, Appendix 23.1**.

Table 23.5 Data sources used to inform the terrestrial ecology and ornithology chapter

Source	Summary	Coverage of study area
NatureScot Sitelink	**Statutory sites designated under International conventions or European Directives**: Sites of Community Importance (SCI), SAC, Candidate Special Area of Conservation (cSAC), SPA, proposed Potential Special Protection Area (pSPA), Ramsar sites and proposed Ramsar sites.	SPAs, proposed SPAs, Ramsar sites and proposed Ramsar sites within a 20km buffer of the Onshore Red Line Boundary, reflecting the upper foraging distances of pink-footed geese[3] during the winter season (Assessing connectivity with special protection areas (SNH, 2016)).
		SACs and possible SACs were also searched for within a 10km buffer of the of the Onshore Red Line Boundary.
RSPB	Winter goose count data for the Loch of Strathbeg (**Volume 3**, **Appendix 23.6**).	Within the Scoping Boundary.
NatureScot Sitelink	**Statutory sites designated under national legislation:** SSSIs, National Nature Reserves (NNRs) and Local Nature Reserves (LNRs).	SSSIs and NNRs within 5km of the Onshore Red Line Boundary.
North East Scotland Biodiversity Record Centre (NESBReC)	**Non-statutory designated sites:** Local Nature Conservation Sites (LNCS) and Scottish Wildlife Trust Reserves.	A buffer of 2km from the Onshore Red Line Boundary was searched for LNCS, Scottish Wildlife Trust Reserves and Ancient Woodland.
Ancient Woodland Inventory (AWI) (Scotland)	**Ancient woodland**: Reference to inventories of Ancient, Long-established and Semi-natural woodlands.	

[3] Pink footed goose being identified as the species with the largest foraging distances of any of the SPA features.

Source	Summary	Coverage of study area
NESBReC	**SBL; Red listed species; and Legally protected species:** Flora, fauna and habitats of principal importance for the conservation of biodiversity in Scotland. Species recorded on the International Union for Conservation of Nature Red List of Threatened Species and / or local Red Lists for the UK (Stanbury *et al*. 2021) or relevant sub-units (for example, regions or counties) and legally protected habitats and non-avian species (bats are considered below). These include those listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended in Scotland) and those included on Schedules 2 and 5 of the Habitats Regulations. Badgers are protected under the Protection of Badgers Act 1992.	A buffer of 2km from the Onshore Red Line Boundary for records of notable or protected species.
	Legally controlled species: Legally controlled species include those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended in Scotland).	A buffer of 2km from the Onshore Red Line Boundary for records of legally controlled (INNS).
	Bat roosting locations: Bat roost locations are considered separately from other species records in accordance with guidance.	Bat records have been provided by NESBReC within 5km the Onshore Red Line Boundary.
British Trust for Ornithology (BTO)	Large waterfowl records were obtained from BTO for the following locations: Loch of Strathbeg, Fraserburgh Bay, Peterhead Bay and Sandford Bay in a five-year dataset covering 2016-2020 (**Volume 3, Appendix 23.6**).	Within the Scoping Boundary.
Scottish Ornithologists' Club / County / Local Bird Recorders	Goose and swan records were obtained for a five-year dataset covering 2016-2020 (**Volume 3, Appendix 23.6**).	

23.5.3 Site surveys

23.5.3.1 The surveys that have been conducted to inform this terrestrial ecology and ornithology assessment are summarised in **Table 23.6**.

Table 23.6 Site surveys undertaken

Survey type	Scope of survey	Coverage of study area
Aerial Phase 1 Habitat surveys	Aerial mapping was collected at an early stage of the Project. Specialist photogrammetric software was used to process the aerial imagery into a georeferenced ortho-mosaic, Digital Surface Model (DSM), and high-density point cloud. A remote sensed digital Phase 1 habitat survey was undertaken to map habitat types using Phase 1 habitat criteria.	2023: Digital mapping was undertaken within 250m of the Onshore Red Line Boundary.
Phase 1 Habitat surveys	Following refinement of the Project, a Phase 1 Habitat Survey walkover following Joint Nature Conservation Committee (JNCC) (2010) methodology was used to establish habitat types. Ground truthing was undertaken to establish correct species composition and subsequent habitat classification, focussing primarily on grassland, marsh, mire, and scrub habitats.	2023: Surveys were undertaken within 250m of the Onshore Red Line Boundary (access permitting).
NVC surveys	An NVC survey was undertaken following Rodwell (2006) to map the vegetation communities and identify those areas of greatest ecological interest (for instance, Annex I habitats; potential GWDTE, and SBL priority habitats).	2024: Surveys were undertaken where the presence of Annex 1 habitat types or potential GWDTEs were identified, following completion of desk study and Phase 1 habitat survey. Surveys were undertaken within 250m of the Onshore Red Line Boundary (access permitting).
Breeding Bird surveys	Generic breeding bird surveys were undertaken following an adapted method based on the BTO's Common Bird Census methodology (Marchant, 1983) and Gilbert *et al*. (1998), which aligns with NatureScot (2022b) Standing Advice. Breeding bird surveys were undertaken over two breeding seasons.	2023: Surveys were undertaken within transects of Proposal of Application Notice Boundary (**Volume 3, Figure 23.1**). 2024: Surveys were undertaken within transects of Proposal of Application Notice Boundary.
Winter Bird surveys.	Winter bird surveys were undertaken over two winter seasons, in 2022 / 2023 and 2023 / 2024 to understand the distribution of pink-footed geese, on land 'functionally linked' with the Loch of Strathbeg SPA. The distribution survey method was adapted from	2022 / 2023: Surveys were undertaken within the Scoping Boundary (**Volume 3, Figure 23.1**). 2023 / 2024: Surveys were undertaken within a smaller defined project boundary (identified as the

Survey type	Scope of survey	Coverage of study area
	that used by Littlewood and Sideris (2016), who surveyed the feeding distribution of geese around the Loch of Strathbeg in 2016.	Proposal of Application Notice Boundary).
Badger (*Meles meles*)	Suitable habitats were surveyed during a protected species walkover following methodology set out in Scottish Badgers (2018).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary.
Otter (*Lutra lutra*)	Suitable habitats were surveyed during a protected species walkover following methodology set out in Chanin (2003); and NatureScot (2020).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary and within a 250m buffer (access permitting).
Bats	Presence of suitable buildings, trees or structures for roosting. Recorded and classified as 'low', 'moderate' or 'high' suitability following Collins (2023).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary.
Water vole (*Arvicola amphibious*)	Suitable habitats were surveyed during a protected species walkover following methodology set out in Dean *et al*. (2016).	2023 / 2024: Surveys of suitable habitats up to 50m outwith the Onshore Red Line Boundary.
Red Squirrel (*Sciurus vulgaris*)	Suitable habitats were surveyed during a protected species walkover following methodology set out in Gurnell and Lurz (2012).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary.
Brown Hare (*Lepus europaeus*)	Suitable habitats were surveyed during a protected species walkover following methodology set out in Cresswell *et al*. (2012).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary.
Pine Marten (*Martes martes*)	The survey includes a systematic search for signs of pine marten presence and potential den sites were surveyed during a protected species walkover, following methodology set out in Cresswell *et al.* (2012).	2023 / 2024: Surveys of suitable habitats within the Onshore Red Line Boundary.

23.5.4 Data limitations

23.5.4.1 There are no known data limitations at the time of this study relating to terrestrial ecology and ornithology that affect the robustness of this EIA Report.

23.6 Baseline conditions

23.6.1 Current baseline

23.6.1.1 A summary of the terrestrial ecology and ornithology baseline is provided in the following Sections. Further information to support the terrestrial ecology baseline is provided in **Volume 3, Appendices 23.2** to **23.7**, which provide information on statutory and non-

statutory designated sites, habitat and vegetation communities present within or connected to the Project, and protected species.

23.6.1.2 Two incidental records or brown hare were observed and there was no field evidence of red squirrel or pine marten were recorded during walkover surveys. These species are therefore not considered in this Section. Further details are provided in **Volume 3, Appendix 23.1** and **Volume 3, Appendix 23.3.**

Scotstown landfall and associated onshore export cable corridor

Designated sites

23.6.1.3 No statutory designated sites are located south of St Fergus Gas Terminal within the Scotstown landfall, however non-designated agricultural land at the landfall has been identified as providing functional connectivity with Loch of Strathbeg SPA / Ramsar due to the fact that it supports concentrations of over-wintering pink-footed geese which forage in the fields (in addition to aggregations of non-designated wintering wildfowl and waders). Further details are presented in **Volume 3, Appendix 23.6** and **Volume 3, Appendix 23.7**.

23.6.1.4 During the 2022 / 2023 surveys, between 297 and 700 pink-footed geese were recorded in this area during each of November, January, February and March. The peak count of 700 equates to approximately 2.5% of the SPA population (NatureScot, 2018). During the 2023 / 2024 distribution surveys between October and March, goose flocks regularly used the area east of St Fergus, with a peak count of 1,150 in October 2023 (4.2% of the SPA Population). These areas of agricultural land are considered functionally linked with the SPA.

23.6.1.5 Additional qualifying feature birds related to Loch of Strathbeg / Ramsar including non-breeding barnacle goose, greylag goose, whooper swan, goldeneye and breeding sandwich tern were not recorded within the onshore environment of the landfall.

23.6.1.6 Herring gull (a qualifying feature of Buchan Ness to Collieston SPA) were only recorded in limited numbers, with individuals recorded overflying the landfall. No herring gull were recorded breeding within or around the Onshore Red Line Boundary. No other qualifying features, including breeding kittiwake, guillemot, fulmar and shag were recorded within the onshore environment of the landfall.

23.6.1.7 The Rattray Head to Peterhead LNCS, overlaps the Onshore Red Line Boundary along the Scotstown landfall. Adjacent fields are important for roosting and feeding geese, waders and wildfowl. Agricultural fields adjacent to the coastline are important for roosting and foraging geese, waders and wildfowl, confirmed by the presence of the following species: curlew, lapwing, golden plover, snipe, redshank, oystercatcher and jack snipe recorded during surveys undertaken in 2022 / 2023 (**Volume 3, Appendix 23.6**) and 2023 / 2024 (**Volume 3, Appendix 23.7**).

23.6.1.8 Rattray Head to Peterhead LNCS also supports sand dune / grassland communities, which comprise the following Annex 1 and SBL habitats: Fixed dunes; Dune grassland; Humid dune slacks; Shifting dunes; and Shifting dunes with marram. Sand dune system habitats are located at the three coastal landfall(s). Much of these sand dune habitats are characteristically mobile, such as, SD5b, SD6a and SD6e. SD5b consists of blue lyme grass (*Leymus arenarius*) and is a foredune community. SD6a and SD6e are communities of marram dune systems found between embryonic dunes to the seaward and fixed dunes to the landward. Occasional SD17 dune slack communities were recorded.

Habitats and vegetation

23.6.1.9 The following broad habitat types dominate the landfall. In the east, an intertidal area grades into open dune habitats, both mobile and vegetated, with occasional dune slack communities. Beyond the dunes, to the west, are improved and poor-semi-improved fields and mature commercial coniferous plantation. Smaller habitat parcels include a small area of broadleaved woodland on the periphery of the commercial conifer plantation and a series of small ditches / field drains. The Annochie Burn runs north to south through the landfall, through the conifer plantation parcels. Beyond the conifer plantations and to the west of the A90 are large arable or improved pasture fields, with occasional shelter belts.

Protected species

23.6.1.10 As noted above, the landfall is mainly comprised of open dune systems, improved / semi-improved grassland and arable pasture and dense commercial conifer plantation. Whilst habitat offers potential for water vole, otter and foraging badger, no records were found. While coniferous woodland does have the potential to support bat species, no potential roosting features were recorded and bat roosting potential was determined to be **Negligible**.

23.6.1.11 No Schedule 1 protected bird species were recorded within the landfall.

Lunderton North landfall and associated onshore export cable corridor

Designated sites

23.6.1.12 No statutory designated sites are located within the Lunderton North landfall and there are no statutory designated sites with structural or functional connectivity to the landfall.

23.6.1.13 No qualifying feature birds related to Loch of Strathbeg / Ramsar, including non-breeding pink-footed goose, barnacle goose, greylag goose, whooper swan, goldeneye and breeding sandwich tern were recorded within the onshore environment of the landfall.

23.6.1.14 Herring gull, which is a qualifying feature of the Buchan Ness to Collieston SPA, were only recorded in limited numbers overflying the landfall. No herring gull were recorded breeding within or around the Onshore Red Line Boundary. No other qualifying features related to, including breeding kittiwake, guillemot, fulmar and shag were recorded within the onshore environment of the landfall.

23.6.1.15 The Rattray Head to Peterhead LNCS, overlaps the Onshore Red Line Boundary along the Lunderton North landfall, which supports sand dune / grassland communities.

Habitats and vegetation

23.6.1.16 The following habitat types dominate the landfall. In the east, an intertidal area grades into open dune habitats, both mobile and vegetated. Beyond the dunes, to the west, is a large and mature commercial coniferous plantation with broadleaf riparian woodland either side of the Cuttie Burn watercourse. North and south of the conifer plantation are large arable fields. Minor habitats include a small pocket of semi-improved grassland and a series of small field drains / ditches around fields to east and west of the A90.

Protected species

23.6.1.17 As noted above, the landfall is mainly comprised of open dune systems, improved / semi-improved grassland and arable pasture and dense commercial conifer plantation. Whilst habitat offers potential for water vole, otter and foraging badger, no records were found.

While coniferous woodland does have the potential to support bat species, no potential roosting features were recorded and bat roosting potential was determined to be **Negligible**.

23.6.1.18 No Schedule 1 protected bird species were recorded within the landfall.

Lunderton South landfall and associated onshore export cable corridor.

Designated sites

23.6.1.19 No statutory designated sites are located within the Lunderton South landfall and there are no statutory designated sites with structural or functional connectivity to the landfall.

23.6.1.20 No qualifying feature birds related to Loch of Strathbeg / Ramsar including non-breeding pink-footed goose, barnacle goose, greylag goose, whooper swan, goldeneye and breeding sandwich tern were recorded within the onshore environment of the landfall.

23.6.1.21 Herring gull were only recorded in limited numbers and no other qualifying features related to Buchan Ness to Collieston SPA, including breeding kittiwake, guillemot, fulmar and shag were recorded within the onshore environment of the landfall.

23.6.1.22 The Rattray Head to Peterhead LNCS, overlaps the Onshore Red Line Boundary along the Lunderton South landfall, which supports sand dune / grassland communities comprising the habitats noted in **paragraph 23.6.1.2**.

Habitats and vegetation

23.6.1.23 The following broad habitat types dominate the landfall. In the east, an intertidal area grades into open dune habitats, both mobile and vegetated. Beyond the dunes, to the west are large improved or arable fields and a semi-improved field to the west of the A90, with occasional tree lined edges along roads or hedgerows. Minor habitats include a small pocket of broadleaved woodland and a series of small field drains / ditches to east and west of the A90. There is a large contiguous area of broadleaf and riparian woodland (including ancient woodland) and open areas of marshy grassland and semi-improved grassland (potentially groundwater dependent) along the River Ugie. Further details are presented in **Volume 3, Appendix 23.2** and **Volume 3, Appendix 20.1: Detailed Hydrological and Hydrological Baseline Report**.

Protected species

23.6.1.24 As noted above, the landfall is mainly comprised of open dune systems, improved / semi-improved grassland and arable pasture. Whilst habitat to the east of the A90 offers potential for water vole and otter, no field signs were recorded. Direct evidence of badger was recorded within the landfall. Owing to the persecution experienced by badger, further detail is not provided in this Chapter. **Volume 3, Appendix 23.3** (**Confidential Appendix A**) provides an account of badger activity with the study area. Brown hare was also recorded in fields to the south of Lunderton and Hall Moss on two occasions.

23.6.1.25 The River Ugie, which flows between landfall and onshore export cable corridor zone A, provides optimal habitat for otter. The river is approximately 15m to 20m wide, with moderate to fast flowing water. The river contains flow at all times of year which provides optimal commuting and foraging opportunities for the species. Recent spraints were recorded along the embankment of the watercourse, confirming that otter utilise the river. It is likely that otter use the watercourse as part of larger commuting and foraging routes, as the River Ugie flows through the wider landscape eventually discharging into the North Sea, north of Peterhead. While suitable resting and breeding habitat, in the form of broadleaved

woodland, was present along the length of the river, no breeding or resting evidence was discovered during the surveys.

23.6.1.26 Suitable bat roosting habitat was recorded along the embankments of the River Ugie. The woodland within this area was mature and offered many potential roosting features which can be utilised by bat species, such as crevices, limb wounds, knot holes and lifted bark. Foraging opportunities were plentiful, with bat species being able to utilise the river and adjacent habitats to feed on invertebrate populations.

23.6.1.27 The River Ugie is also a known salmonid migration route within the Onshore Red Line Boundary.

Onshore export cable corridor zone A

Designated sites

23.6.1.28 No statutory or non-statutory designated sites are located within onshore export cable corridor zone A and there are no statutory or non-statutory designated sites with structural or functional connectivity to the landfall.

Habitats and vegetation

23.6.1.29 The onshore export cable corridor is dominated by habitats associated with the intensive agricultural land management of the study area. Arable crop land dominated, with smaller areas of improved grassland also recorded. Field boundaries are largely comprised of species-poor hawthorn hedgerows in various states of intactness. Occasional shelter belts and tree lined fields were also recorded.

23.6.1.30 The main area of ecological diversity is the River Ugie and its associated riparian broadleaved wood and scrub, as discussed under the Lunderton South landfall.

Protected species

23.6.1.31 The onshore export cable corridor is largely comprised of improved grassland pasture or occasional arable fields. Suitable habitat for all protected species was limited, as the habitats within this area were intensively managed. The majority of the improved grassland pasture contained grazing livestock.

23.6.1.32 No badger activity was recorded within the onshore export cable corridor zone A.

Onshore substations

Designated sites

23.6.1.33 No statutory or non-statutory designated sites are located within the onshore substation zone and there are no statutory or non-statutory designated sites with structural or functional connectivity to the onshore substation zone.

Habitats and vegetation

23.6.1.34 The onshore substation zone is dominated by habitats associated with the intensive agricultural land management of the study area, comprising improved grassland. Small strips of semi-improved grassland, ruderal vegetation or marshy grassland are present along the boundary, in addition to species-poor hawthorn hedgerows in various states of intactness. As marshy grassland has potential for groundwater dependency, these areas

were classified to NVC level. Further details are presented in **Volume 3, Appendix 23.2** and **Volume 3, Appendix 20.1**.

Protected species

23.6.1.35 The onshore substation zone is largely comprised of improved grassland pasture or occasional arable fields. Suitable habitat for all target protected species was limited, as the habitats within this area were intensively managed. The majority of the improved grassland pasture contained grazing livestock at the time of survey.

23.6.1.36 Direct evidence of badger was recorded within the onshore substations. **Volume 3, Appendix 23.3** provides an account of badger activity with the study area.

Onshore export cable corridor zone B

Designated sites

23.6.1.37 No statutory or non-statutory designated sites are located within the onshore export cable corridor zone B and there are no statutory or non-statutory designated sites with structural or functional connectivity to the onshore substation zone.

Habitats and vegetation

23.6.1.38 The onshore export cable corridor is dominated by habitats associated with the intensive agricultural land management of the study area, comprising improved grassland or arable fields. Small strips of semi-improved grassland, ruderal vegetation or marshy grassland are present along the boundary, in addition to species-poor hawthorn hedgerows in various states of intactness, as well as occasional treelines along field boundaries. As marshy grassland has potential for groundwater dependency, these areas were classified to NVC level. Further details are presented in **Volume 3, Appendix 23.2** and **Volume 3, Appendix 20.1**. The Burn of Faichfield runs south to north.

Protected species

23.6.1.39 The onshore export cable corridor contained a small number of habitats which were suitable for target protected species.

23.6.1.40 The Burn of Faichfield provides suitable commuting habitat for otter. The watercourse is a tributary of the River Ugie and flows through part of the onshore export cable corridor. The watercourse is approximately 2m to 4m wide, with slow to moderate flowing water at the time of the survey. The embankments were predominately grassland, with some scattered broadleaved trees. While no otter evidence was recorded within the Onshore Red Line Boundary, fresh spraint was recorded along this watercourse approximately 800m downstream, confirming that otter use this watercourse.

23.6.1.41 A number of woodland stands and treelines within the onshore export cable corridor provide potential roosting features for bats, particularly along the embankments of the Burn of Faichfield. Potential roosting features, such as crevices, limb wounds, knot holes and lifted bark, can be utilised by bat species.

23.6.1.42 Badger activity was recorded within the onshore export cable corridor. **Volume 3, Appendix 23.3** (**Confidential Appendix A**) provides an account of badger activity with the study area.

23.6.2 Future baseline

23.6.2.1 According to SNH (2018), baseline studies should identify the existing processes of change in the environment, which are likely to influence the character of the site or its surrounds, so that any changes that are predicted to occur due to the Project can be distinguished from those which are expected to occur anyway. The predicted future environmental conditions which would exist if the Project did not materialise is known for EIA purposes as the 'do nothing scenario'.

23.6.2.2 Determining a future baseline draws upon information about the likely future use and management of the site in the absence of development, known population trends (for species), climate change and any ‘other developments’ (consented or otherwise) that may act cumulatively with the Project components to affect ecological features.

23.6.2.3 Much of the landscape within the Onshore Red Line Boundary is presently managed for livestock grazing, arable crops, and occasional commercial forestry plantation. The ‘do nothing scenario’ would therefore likely be for the area to remain primarily unchanged if the Project did not go ahead.

23.6.2.4 However, climate change may be influential on the future baseline, particularly in relation to coastal habitats, and this is considered further.

Implications of climate change on future baseline

23.6.2.5 The predicted effects of climate change are like to have a bearing on the future terrestrial ecology conditions within the Onshore Red Line Boundary. The Scottish Government's climate change projections for Scotland indicate that the country will experience increasingly warmer and wetter winters, along with drier summers and more intense rainfall events. These changes are already being felt and are projected to continue and intensify. The Scottish National Adaptation Plan (SNAP3) (Scottish Government, 2024b) aims to prepare for these impacts and build resilience. Based on Scottish Government predictions the following are considered likely:

- increased erosion: rising sea levels and more intense storms are likely to accelerate coastal erosion;
- loss of land and habitats: beaches, dunes, and coastal habitats will be lost or significantly altered, affecting biodiversity;
- flood risk: storm surges and high tides, exacerbated by sea level rise (projected to increase by 30 centimetres (cm) to 60 cm by 2100), will increase the frequency and severity of coastal flooding, impacting homes, infrastructure, and farmland;
- habitat shifts: salt marshes, mudflats, and coastal wetlands may diminish or shift inland, impacting bird populations and marine biodiversity; and
- ocean warming and acidification: local marine ecosystems may be affected, influencing fish stocks and altering species distributions.

23.6.2.6 The way climate change will affect global biodiversity cannot be accurately determined with current data sets; however it is likely that habitat fragmentation, extreme weather events (including extensive flooding and wind fall), and the spread of INNS would occur which could act to further reduce the ecological value of coastal habitats within and around the Onshore Red Line Boundary.

23.6.2.7 Aberdeenshire Council Local Climate Impact Profile 2019 to 2022 highlights the region’s vulnerability to severe weather events and the potential effects on its infrastructure, based on the UK Climate Projections 2018 (UKCP18) (Met Office, 2018). It notes that the most

frequently experienced severe weather in Aberdeenshire were storms and high winds, excessive rainfall, extreme low temperatures / snow and ice.

23.6.2.8 Qualitative predictions of how climate change may affect ecological receptors has been attempted for some species / groups, for example, avian population change (notably wildfowl) in the UK: the BTO in 2004 noted that "*the number of wintering …geese might be predicted to fall as (they) will have to move shorter distances south to avoid harsh winter conditions of the highest latitudes"* (Brides *et al*. 2021). The UK Icelandic-breeding pink-footed goose population has, however, risen substantially in the last 20 years to over 450,000 wintering birds (Brides *et al*. 2021), driven by factors in the breeding and winter grounds, including increased productivity and food availability associated with higher temperatures (Burton *et al*. 2023).

23.6.2.9 Thus, the predicted temperature and precipitation changes across the North East of Scotland may result in changes to wildfowl distribution and behaviour in the longer-term, however there is uncertainty as to the direction or extent of change. Nevertheless, the baseline bird community as described in this Chapter, including the wintering wildfowl population, is considered to provide a valid description of the ornithological assemblage over the lifespan of the Project, with wintering goose populations likely to remain stable or even increase with the predicted increase in winter temperatures.

23.6.2.10 Given the complexity and uncertainty in making predictions about how climate change may affect ecological receptors, coupled with the likelihood that current land management practices will continue in the absence of the Project, it has therefore been assumed that the baseline described in this Chapter remains a valid description of all ecological receptors likely to be present over the lifespan of the Project.

23.7 Basis for the EIA Report

23.7.1 Maximum design scenario

23.7.1.1 The process of assessing using a parameter-based design envelope approach means that the assessment considers a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the planning application, marine licences applications and section 36 consent.

23.7.1.2 The assessment of the maximum adverse scenario for each IEF establishes the maximum potential adverse effect and as a result effects of greater adverse significance would not arise should any other scenario (as described in **Chapter 4: Project Description**) to that assessed within this Chapter be taken forward in the final Project design.

23.7.1.3 The maximum design scenario parameters that have been identified to be relevant to terrestrial ecology and ornithology are outlined in **Table 23.7** and are in line with the project design envelope (**Chapter 4: Project Description**).

Table 23.7 Maximum design scenario for impacts on terrestrial ecology and ornithology

Activity / impact	Maximum design scenario parameter	Justification
Construction, operation and maintenance and decommissioning		
Impact 1: Land take / land cover change - Functionally-linked non-designated habitat supporting pink-footed geese, associated with Loch of Strathbeg SPA / Ramsar	**Construction:** <u>Landfall(s):</u> Assumes maximum footprint of construction activities for all landfall(s) (Scotstown and Lunderton North and South): • temporary access road/s up to 6m wide, location see **Volume 2, Figure 4.1: Onshore Red Line Boundary and indicative onshore infrastructure**; • temporary construction compound area 345m x 70m; • up to seven below ground transition joint bays, typically 12m long x 3.5m wide x 2.5m deep; • up to eight cable ducts; and • cable ducts installed using horizontal direction drilling (HDD) (or similar trenchless technique) between landfall(s) and onshore substations. In relation to trenchless crossings, HDD (or similar trenchless technique) has been presented in the EIA. Whilst other trenchless methods are available, HDD (or similar trenchless technique) is presented herein as it is likely to have the largest construction impact. Landfall construction works duration: • phase 1 – up to one year; • phase 2 – up to one year; and • phase 3 – up to one year. <u>Onshore export cable corridor:</u> • temporary access roads / haul roads up to 6m wide, location see **Volume 2, Figure 4.1**;	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. The total area affected would be 188ha.

Activity / impact	Maximum design scenario parameter	Justification
	• for the onshore export cable corridor from the landfall(s) to the onshore substations, the corridor is up to 89m wide and an approximate length of 11km; • up to six trenches, with typical trench depth of up to 1.5m; • onshore export cable corridor from the onshore substations to the SSEN Netherton Hub, the corridor is up to 99m wide and an approximate length of 2.35km; and • up to seven trenches, with typical trench depth of up to 1.5m between the onshore substations to the grid. Joint bays: • typically, joint bays are located every 600 to 1000m; • at each joint bay location, along the onshore export cable corridor from the landfall(s) to the onshore substations, there are up to six joint bays; • at each joint bay location, along the onshore export cable corridor from the onshore substations to SSEN Netherton Hub, there are up to seven joint bays; • each joint bay will be approximately 9m long by 3m wide, with a depth of up to 2m; • joint bay construction duration per location (does not include cable pulling duration) is six to ten weeks; • each joint bay will have an associated link box and fibre optic cable (FOC) junction box that will be accessible at surface level; and • each link box and FOC junction box will be approximately 3m long by 1m wide, with a depth of up to 1.5m. The temporary construction corridor may require widening beyond the standard width to allow enough space for access / equipment at crossing points with roads, rivers or utilities, and to avoid other obstacles to installation. Trenchless crossings: • the onshore export cable corridor widens to up to 300m at locations where trenchless crossings are required;	

Activity / impact	Maximum design scenario parameter	Justification
	• twenty-two trenchless crossing compounds; • trenchless crossing compound dimensions: up to 300m x 50m (width and length); and • six to twelve months construction duration per trenchless crossing location (does not include cable pulling duration). A crossings schedule is provided in **Volume 3, Appendix 4.1: Crossings Register**. Temporary construction compounds: • up to three temporary primary construction compound locations (each up to 125m x 125m in area); • up to six temporary secondary construction compound locations (each up to 100m x 100m in area); and • construction of each joint bay will require a temporary construction compound (each up to 30m x 85m in area). Onshore export cable corridor construction works duration: • Phase 1 – up to two and a half years; • Phase 2 – up to one year; and • Phase 3 – up to one year. <u>Onshore substations:</u> • up to 15 hectares (ha) permanent area for the onshore substations with associated permanent access roads up to 4.2ha, plus additional drainage / landscaping areas estimated at approximately 36ha, all of which will be located within the Onshore Red Line Boundary; and • up to 3.06ha additional temporary construction compound area. Onshore substations construction works duration: • Phase 1 – up to three years; • Phase 2 – up to three years; and • Phase 3 – up to three years.	

Activity / impact	Maximum design scenario parameter	Justification
	O&M: <u>Onshore export cable corridor:</u> • all permanent onshore export cable infrastructure including the landfall(s) will be below ground; and • minimal maintenance required (periodic testing at joint boxes every two to five years). <u>Onshore substations:</u> • up to 15ha permanent area for onshore substations with two associated permanent access roads up to 4.2ha plus drainage / landscaping areas estimated at approximately 36ha, all of which will be located within the Onshore Red Line Boundary; and • each onshore substation will be operational for up to 35 years. Maximum main building height: • up to 17.5m for High Voltage Alternating Current (HVAC) infrastructure; and • up to 30m for High Voltage Direct Current (HVDC) infrastructure. Maximum number of buildings (all infrastructure housed internally): 35. Maximum building length: • up to 78m for HVAC infrastructure; and • up to 104m for HVDC infrastructure. Maximum building width: • up to 40m for HVAC infrastructure; and • up to 88m for HVDC infrastructure. Maximum external infrastructure height: • up to 12m for HVAC infrastructure; and • up to 16.6m for HVDC infrastructure. Lightning mast height – up to 32m.	

Activity / impact	Maximum design scenario parameter	Justification
	The operational lifetime of each phase of the Project is up to 35 years from commissioning of wind turbine generators. **Decommissioning** <u>Onshore substations:</u> • the onshore substations and associated access roads will be removed and the site reinstated; and • the decommissioning works are likely to be undertaken in reverse to the sequence of construction works and involve similar types and levels of equipment and vehicles. Assessment assumptions as per construction stage. <u>Onshore export cable corridor:</u> Onshore export cables will be left in-situ with ends cut, sealed and buried to minimise environmental effects associated with removal. The underground structures of the joint bays, FOC junction boxes and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use.	
Impact 2: Increased human presence, noise and vibration - functionally linked non-designated habitat, supporting pink-footed geese, associated with Loch of Strathbeg SPA / Ramsar; and Rattray Head to Peterhead LNCS (winter bird assemblage)	Refer to Impact 1 within a 500m buffer.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Direct effects on qualifying features of the SPA / Ramsar within non-designated functionally linked land within a 500m disturbance buffer of the Onshore Red Line Boundary, based on Goodship and Furness (2022).

Activity / impact	Maximum design scenario parameter	Justification
Impact 3: Land take / land cover change – Rattray Head to Peterhead LNCS (sand dune communities and winter bird assemblage)	Refer to Impact 1.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Habitat loss calculations will be based on the parameters of the infrastructure components outlined in Impact 1 (total area 188ha).
Impact 4: Introduction of INNS – Rattray Head to Peterhead LNCS (sand dune communities)		
Impact 5: Changes in hydrology and pollution events – Rattray Head to Peterhead LNCS (sand dune communities)		A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Hydrological connectivity to Rattray Head to Peterhead LNCS will be considered based on the maximum footprint outlined in Impact 1.
Impact 6: Land take / land cover change - ancient woodland and veteran trees	Refer to Impact 1.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Habitat loss calculations will be based on the parameters of the infrastructure components outlined in Impact 1.
Impact 7: Introduction of INNS - ancient woodland and veteran trees		
Impact 8: Land take / land cover change - habitats within the Onshore Red Line Boundary with a level of importance of local or above	Refer to Impact 1.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary.

Activity / impact	Maximum design scenario parameter	Justification
Impact 9: Land take / land cover change - all protected and notable species within the Onshore Red Line Boundary	Refer to Impact 1 within a 30m buffer.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Direct effects on protected or notable species within a 30m buffer will be considered around the maximum footprint outlined in Impact 1.
Impact 10: Fragmentation of habitats - protected and notable species within the Onshore Red Line Boundary		
Impact 11: Increased human presence, noise and vibration - protected and notable species within the Onshore Red Line Boundary		
Impact 12: Increased light levels - protected and notable species within the Onshore Red Line Boundary		
Impact 13: Direct mortality - protected and notable species within the Onshore Red Line Boundary	Refer to Impact 1.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary.
Impact 14: Changes in hydrology and pollution events - protected and notable species within the Onshore Red Line Boundary	Refer to Impact 1.	A maximum design scenario assumes that development may take place anywhere within the Onshore Red Line Boundary. Hydrological connectivity to protected and notable species will be considered based on the maximum footprint outlined in Impact 1.

23.7.2 Embedded environmental measures

23.7.2.1 As part of the Project design process, embedded environmental measures have been adopted to reduce the potential for adverse impacts on terrestrial ecology and ornithology. These embedded environmental measures have evolved over the design process as the EIA has progressed and in response to consultation.

23.7.2.2 These measures also include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements. As there is a commitment to implementing these embedded environmental measures, and also to various standard sectoral practices and procedures, they are considered inherently part of the design of the Project and are set out in this EIA Report.

23.7.2.3 **Table 23.8** sets out the relevant embedded environmental measures within the design and how these affect the terrestrial ecology and ornithology assessment.

Table 23.8 Relevant terrestrial ecology and ornithology embedded environmental measures

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
M-001	Underground cables will be used to connect from the landfall(s) transition joint bays to the onshore substations. An additional section of the onshore export cable corridor will run from the onshore substations to the grid connection point at SSEN Netherton Hub. Cables are typically installed in ducts in a standard buried trench arrangement with appropriate insulation, providing protection from temperature extremes and changes in soil moisture.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP** and planning conditions.	Design optimisation to avoid / minimise impacts to sensitive habitats.
M-002	Sensitive sites will be avoided by the temporary and permanent onshore project footprint including SPAs, SACs, SSSIs, NNR, Local Nature Reserves, Local Wildlife Sites, Ancient woodland, areas of consented development, areas of historic landfill and other known areas of potential contamination, Scottish National Trust land, listed buildings and scheduled monuments, potable water supply abstractions, floodplains and geomorphic risk areas.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP** and planning conditions.	Design optimisation to avoid / minimise impacts to designated sites.
M-005	To reduce the environmental impact of the landfall(s), a trenchless solution is to be implemented to install ducts. Whilst other trenchless methods are available, HDD (or similar trenchless technique) is presented. Determination of the most suitable trenchless landfall crossing method will be undertaken during the detailed design stage of the Project, following geotechnical investigation of the onshore and nearshore areas.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	HDD (or similar trenchless technique) will help protect existing vegetation communities, reducing the impact on biodiversity.
M-006	<u>Vegetation (trees / woodland / hedgerows)</u> Vegetation will be retained where possible as detailed in **Volume 3, Appendix 23.10** and associated Figure 1 Tree Removal and Protection Plan. Otherwise, vegetation removal will be undertaken in line with British Standard (BS) 5837-2012 (Trees in relation to	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Design optimisation to avoid / minimise impacts to habitats.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
	design, demolition and construction) and scheduled to avoid bird breeding seasons. Ancient woodland will be retained with a stand-off of a minimum of 25m from any surface construction works using HDD (or similar trenchless technique), at a depth >6m. With regards to other woodland / forestry, the onshore export cable construction corridor will be reduced, where practical, to minimise tree loss and where the construction corridor passes close to woodland that is being retained, BS5837:2012 root protection to apply. Hedgerows with trees / tree lines which are crossed by the onshore export cable corridor will be notched to reduce landscape impacts. All hedgerows that are to be retained, coppiced, notched (vegetation removed only where trenching occurs) or lost are to be mapped. Vegetation may be coppiced / pruned to allow access and visibility splays at junctions.			
M-007	Best practice air quality management measures will be applied as described in IAQM (2024) guidance on the Assessment of Dust from Demolition and Construction to avoid adverse effects on sensitive features. Examples of pathway include windblown dust / fibres or tracking back of dust / fibres is a potential contamination migration and vehicle standards.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP** and planning conditions.	Best practice air quality management measures.
M-008	Pollution control strategy will be in line with good practice and in accordance with Controlled Activity Regulations (CAR) licence regulations, pollution prevention plans and emergency plans to be drawn up to detail how ground and surface waters and the ecological features they support, would be protected in construction and operation. These will include information on the storage of any fuels, oils and other chemicals and pollution incidence response planning, plus measures for the protection of licenced and private	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Pollution control measures help protect habitats and species within aquatic or wetland habitats.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
	abstractions. This could include a monitoring regime associated with critical or very proximate receptors.			
M-009	Areas of temporary habitat loss will be reinstated, wherever practicable, following the completion of construction in each area. Wherever possible, reinstatement will be back to the type of habitat crossed.	Scoping	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Reinstating habitats can ensure no net loss and avoid / minimise fragmentation of habitat features.
M-011	A lighting design of all temporary and permanent lighting will be developed once contractors are appointed. Joint guidance is provided by the Bat Conservation Trust and Institution of Lighting Professionals (2023). The lighting design will account of the potential effects on terrestrial ecology and people (residents) by taking measures to minimise lighting usage, minimise light spill, use most appropriate wave lengths of light and locate lighting in the most appropriate locations – this is to decrease the potential displacement effects on light sensitive fauna, such as bats.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / mitigate light pollution on protected species and birds.
M-012	Speed limits (of no greater than 15 miles per hour (mph)) will be imposed on all construction haul roads and access tracks to minimise the risk of road traffic collisions with fauna such as badgers, otters, bats and barn owls.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / mitigate risk of direct mortality of protected species by vehicles during construction stage.
M-027	At any sensitive features identified along the route, the working width of the temporary construction corridor will be reduced as far as practicable to avoid or minimise potential environmental effects. Where it is necessary to cross sensitive features, such as watercourses and woodland, trenchless construction methods will be used to install ducts under the crossed feature, which the onshore export cables are then pulled through via entry and exit pits.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP,** description of Project and planning conditions.	Design optimisation to avoid / minimise impacts to sensitive habitat features.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
M-063	A CEMP will be implemented by the contractor in accordance with **Volume 4: Outline CEMP**. The contractor will ensure that the relevant environmental measures within the CEMP and health and safety procedures are implemented. The CEMP identifies the project management structure roles and responsibilities with regard to managing and reporting on the environmental impact of the construction stage.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP,** Planning conditions.	A plan that outlines measures to minimise construction impacts on ecological features including habitats and protected species.
M-066	The permanent rights or servitude for the onshore export cable corridor will be kept to the minimum width needed for safe access for cable maintenance or replacement purposes during operation of the Project.	Scoping	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps minimise disturbance / displacement effects to habitats and species during operation stage.
M-077	Where possible micro-siting will be undertaken during detailed design to avoid ponds and wetlands.	Scoping	**Volume 4: Outline CEMP** and planning conditions.	Design optimisation to avoid / minimise disturbance / displacement effects to protected species such as water vole and otter.
M-080	Drainage design to manage and, if necessary, treat surface water run-off will be included in all elements of temporary construction sites and permanent operational infrastructure. A CAR license will be required for all sites that exceed five hectares in area. Drainage design will follow the sustainable drainage systems hierarchy principles including allowances for climate change and discharge at pre-development rates (as set out in **Volume 4: Outline Operational Drainage Management Strategy**). Where the development intersects overland flow pathways or areas of known surface water flooding appropriate measures will be embedded into the design. All subsurface infrastructure will be designed to facilitate subsurface flow pathways to avoid any localised increases in groundwater flooding.	Scoping	**Volume 4: Outline CEMP** and planning conditions.	Measure that helps avoid / minimise pollution pathways to habitats / species and designated sites during construction and operation.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
M-085	The Project will avoid causing fragmentation of woodland, semi-natural land or sensitive habitats where possible, through the use of existing breaks in land use or use of HDD (or similar trenchless technique) to avoid disturbance of / change to land cover.	Scoping Amended at EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / minimise fragmentation of habitats.
M-086	Compliance with the Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012) the use of tried and tested onshore invasive species control and biosecurity measures to avoid the spread of infested materials will be applied.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that ensures designated sites and habitat features avoid degradation or modification.
M-124	The Project will follow Scottish Water's 'Precautions to Protect Drinking Water and Scottish Water Assets During Windfarm Construction and Operational Activities' guidance. Where it is impractical for infrastructure and activities to be located outside of the River Ugie DWPA, then all infrastructure and activities should be located 100m from any watercourse wherever possible, and a minimum of 50m distance where 100m can be demonstrated to be undeliverable. This includes cable trenches, soil stockpiles, access tracks, trenchless crossing, temporary construction related activities such as plant, refuelling, storage of hazardous materials, cement batching, waste storage, concrete preparation, wheel washing / washout areas, and temporary construction compound areas.	EIA Report	**Volume 4: Outline CEMP** and planning conditions.	Measure that helps avoid / minimise pollution pathways and disturbance to aquatic and riparian species.
M-126	River Water Framework Directive (WFD) waterbodies (River Ugie and Burn of Faichfield) and their tributary watercourses (within the River Ugie DWPA) will be crossed via trenchless construction techniques to minimise potential impacts on water quality at these locations. The depth of the trenchless crossing will be such that the riverbed and watercourse is undisturbed by construction activities. Specific construction method statements will be prepared.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / minimise pollution pathways to Atlantic salmon / sea trout.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
M-132	Contractors will be made aware of their statutory responsibility not to "*cause or knowingly permit water pollution*." A Pollution Prevention Plan (PPP) and Pollution Incident Response Plan (PIRP) will be prepared for the Project, the latter in line with Pollution Prevention Guideline (PPG) 21 (Environment Agency for England and Wales, the Northern Ireland Environment Agency and the SEPA, 2009), and all contractors will be briefed on these plans, with copies made available on site.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / minimise pollution pathways to habitats / species and designated sites during construction.
M-133	An ECOW will oversee the construction stage works ensuring that works areas can be appropriately micro-sited where appropriate to avoid or minimise habitat loss, in accordance with the Outline CEMP and latest available species-specific guidance.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure will ensure avoidance / minimisation of habitat loss and disturbance impacts to protected species.
M-134	Pre-construction ecology surveys will be undertaken to inform the specification of relevant impact avoidance and mitigation measures, such as relevant stand-off distances etc, in accordance with the Outline CEMP and latest available species-specific guidance.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure will ensure avoidance / minimisation of disturbance impacts to protected species.
M-135	An onshore SPP outlining how the Project will address potential impacts on protected species, in accordance with the Outline CEMP and latest available species-specific guidance. This will include a Bird Protection Plan (BPP) to safeguard breeding and wintering bird species. Adherence to the BPP will be employed to ensure careful timing of construction activities within or near to sensitive locations will avoid or minimise effects on all breeding birds as well as foraging winter wildfowl (including geese and swans), including noise reduction measures, including the employment of 'soft-start' measures to all noisy activities to avoid sudden disturbance, minimising the working footprint avoidance or reduction of any working during hours of darkness. The SPP and BPP will be updated with data from the pre-construction surveys. Implementation of the BPP would be overseen	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure will ensure avoidance / minimisation of disturbance impacts to protected species, breeding and wintering birds

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
	by a suitably experienced ECoW or Project Ecologist in order to inform the construction stage process.			
M-136	Protection of breeding bird nests from damage and/or destruction during the breeding season, in accordance with the Wildlife and Countryside Act 1981 (as amended by the Nature Conservation (Scotland) Act 2004). Wherever reasonably practicable, all vegetation clearance will occur outside the bird breeding season (i.e. between September – mid-March, inclusive), to avoid damage to or destruction of active nests by the proposed works. If work is required after the mid (15th) March, the ECoW will search areas of clearance in advance of works and recommend a buffer around active nests as appropriate. This would include any areas of clearance and vegetation removal for access tracks, compounds or onshore substation areas due to the populations of ground nesting birds on and around the site.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure will ensure avoidance of damage or destruction to breeding bird nests
M-148	In areas where there are groundwater seepages / flush zones identified along the access tracks at the detailed design stage, the Contractor(s) will utilise geotextiles beneath the track material or bog-mat where necessary to prevent the track from settling into the ground to help maintain sub-surface flow.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / minimise pollution pathways to sensitive habitats during construction.
M-156	All permanent export cable crossings will pass beneath the bed of watercourses (there will be no 'within bank' crossings). Sufficient depth between the bed of the watercourse and the top of the cable (whether trenchless or open cut) will be provided to ensure no potential for exposure of cable due to scour.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure that helps avoid / minimise impacts to species utilising freshwater and riparian habitats.
M-213	Good practice measures to prevent harm to fauna will include the careful storage of potentially dangerous substances or materials within construction compounds. All excavations greater than 1m depth would either be temporarily	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure to helps avoid harm to protected species.

ID	Environmental measure proposed	Project stage measure introduced	How the environmental measures will be secured	Relevance to terrestrial ecology and ornithology assessment
	covered at night or designed to include a ramp to allow fauna (such as protected mammals) a means of escape should they fall in.			
M-214	Working during the hours of darkness will be avoided as far as practicable to reduce disturbance to protected species. Working during the hours of darkness will likely be unavoidable during winter, therefore lighting will avoid illuminating sensitive habitats including rivers, wetlands and sites where there is known activity of protected or notable species.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Measure to helps avoid harm to protected species
M-215	All tree felling where PRFs have been identified would be preceded by a survey for roosting bats, regardless of the known presence of a roost. This would ensure the baseline information remains valid (e.g., in case of any delays between additional baseline surveys described above and construction start) and reduce the risk of encountering bats during invasive works. For trees, this would comprise an inspection of PRFs (from ground-level or at-height) within 24-48 hours before felling, regardless of the time of year. If a new roost is identified, works would be postponed until a licence is in place.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	Avoidance of contravention of bat legislation.
M-216	A bat licensed surveyor would oversee tree felling of any PRFs, regardless of the known presence of a roost or time of year.	EIA Report	**Volume 4: Outline CEMP**, description of Project and planning conditions.	

23.7.2.4 Further detail on the embedded environmental measures in **Table 23.8** is provided in the **Volume 3, Appendix 5.2: Commitments Register**, which sets out how and where particular embedded environmental measures will be implemented and secured.

23.8 Methodology for the EIA Report

23.8.1 Introduction - scoping assessment

23.8.1.1 The project-wide approach to assessment is set out in **Chapter 5: Approach to the EIA**. Whilst this has informed the approach that has been used in this terrestrial ecology and ornithology assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the terrestrial ecology and ornithology assessment.

23.8.1.2 The starting point for defining the scope of the terrestrial ecology and ornithology assessment was to use the baseline data collected through the desk study and field surveys (see **Section 23.6**) to determine which of the identified ecological features are 'important'. Following CIEEM guidance (2018, updated 2024), the importance of each ecological feature was determined using a geographic scale[4] (see **Table 23.9**). The importance of the ecological features has been described in relation to UK legislation and policy and regarding the extent of habitat or size of population that may be significantly affected by the Project (as presented in **Volume 3, Appendix 23.8**).

23.8.2 Determining importance of features

23.8.2.1 As the importance of ecological features is determined regarding the extent of habitat or size of population that may be affected by the Project, 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 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.

23.8.2.2 Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the categorisation and determine importance at the project level. Where detailed criteria or contextual data were not available at this stage of the Project, professional judgement was used to determine the level of importance.

[4] Where this was not possible due to the level of baseline information currently available the highest relevant level of importance is assumed to ensure no ecological features are scoped out of future assessment when not appropriate.

Table 23.9 Defining importance of ecological features

Geographic context of importance	Example / description
International or European	i. The National Site Network including SACs, cSACs, SCIs and SPAs; pSPAs and potential Special Area of Conservations should also be considered in the same manner in accordance with National Planning Policy. ii. 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	i. Nationally designated sites including SSSIs and NNRs. ii. 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. iii. SBL habitats and species, and legally protected species that are not addressed directly in Part 2 of the "Guidelines for Selection of SSSIs" (JNCC, 2024), but can be determined to be of national importance using the principles described in Part 1 of the guidance. iv. 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. v. Areas of ancient woodland for example, woodland listed within the AWI.
Regional	i. Regionally occurring populations of SBL species will be considered of regional importance in the context of published information on population size and distribution. ii. Large areas of modified or degraded priority habitats, which are important in a regional context.
Council area / District	i. LNRs and Non-statutory designated sites (for instance, Local Nature Conservation Sites – LNCSs in Aberdeenshire). ii. 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	i. 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. ii. Common and widespread semi-natural habitats occurring in proportions greater than may be expected in the local context. iii. Common and widespread native species occurring in numbers greater than may be expected in the local context.
Negligible	i. Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area. ii. Areas of heavily modified or managed land uses (for example, hard standing used for car parking, as roads etc.).
Neutral	i. No identified impact pathways to any features.

23.8.2.3 Where protected species are present and there is the potential for a breach of the legislation, those species should always be considered as IEFs. An exception might be for such species receiving specific legal protection, or those subject to legal control (for example, invasive species), determined to be of negligible importance and scoped out of the assessment. This approach is consistent with that described in CIEEM (2018).

23.8.2.4 Legally protected species and ecological features that are of sufficient importance that effects upon them from the Project could be significant, were then taken through to the next stage of the scoping assessment. Through an understanding of the activities associated with the Project and the resulting environmental change, it is possible to identify ecological features that may be subject to potentially significant effects. To identify such ecological features, all the activities and consequent environmental changes associated with the construction, operation and decommissioning of the Project have been considered.

23.8.2.5 Given the ongoing design process, at this stage of the Project the environmental changes have been considered in broad categories only. Wherever there is uncertainty as to the potential level of effect or the occurrence of a particular ecological feature, a precautionary approach has been taken.

Determining Zones of Influence

23.8.2.6 Key to establishing a potentially significant effect is the determination of a ZOI for each ecological feature. ZOIs differ depending on the type of environmental change (in other words the change from the existing baseline) because of the Project, and the ecological feature being considered.

23.8.2.7 The construction, O&M, and decommissioning stages of the Project may result in the following broad environmental changes:

- permanent or temporary land take / land cover change (resulting in habitat loss or degradation and / or loss of fauna);
- fragmentation of habitats (resulting in a reduction in connectivity);
- increased noise and vibration (resulting in disturbance / displacement);
- increased light levels (resulting in disturbance / displacement);
- changes in hydrology (ground water levels and surface water run-off rates resulting in habitat change);
- pollution events to water sources, soil and groundwater contamination (including the liberation of dust, sediments and chemicals resulting in loss or degradation of fauna and flora); and
- introduction or spread of INNS (resulting in habitat degradation).

23.8.2.8 The most straightforward ZOI to define is the area affected by land-take and direct land-cover changes associated with the Project. This ZOI is the same for all affected ecological features. By contrast, for each environmental change that can extend beyond the area affected by land-take and land-cover change (for example noise created by construction and decommissioning), the ZOI may vary between ecological features, dependent upon their sensitivity to the change and the precise nature of the change. For example, an otter might be disturbed by noise generated near its resting site, whilst nesting lapwing might be disturbed by noise generated at a much greater distance; other species (for example, 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 is based upon professional judgement informed, as far as possible, by a review of published evidence (see **Table 23.5** and **Table 23.6**).

23.8.2.9 It should be noted that the avoidance of potential effects through design are implicitly taken into account through the consideration of each ZOI. Furthermore, when scoping in or out ecological features from further assessment, embedded environmental measures (see **Table 23.8**) associated with good practice have been taken into account (for example dust suppression, appropriately scheduled vegetation removal etc.).

23.8.3 Significance evaluation methodology

Overview

23.8.3.1 The significance level attributed to each effect has been assessed based on the importance of the affected features and the magnitude of change resulting from the Project. The level of significance has then been determined by the combination of importance and magnitude.

23.8.3.2 CIEEM (2018) defines a significant effect as one "*that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general*".

23.8.3.3 The term "*potentially significant effects*" is used to describe effects that have the potential to be significant prior to their assessment (for instance, until the end of the "scope of the assessment"), and the term "*likely significant effects*", only once assessment has determined that they would indeed be significant.

23.8.3.4 When considering likely significant effects on ecological features, whether these are adverse or beneficial, the following characteristics of environmental change will be considered:

- extent – the spatial or geographical area and sensitivities 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 an environmental change may occur;
- timing – the periods of the day / year / season during which an environmental change may occur; and
- reversibility – whether the environmental change can be reversed through restoration actions or regeneration.

Magnitude of change

23.8.3.5 Although the characteristics described above are all important in assessing effects, a scale of the environmental change as a result of the Project will also be used (following CIEEM, (2018)), as described in **Table 23.10**, to provide a contextual understanding of the relative change from the baseline position.

Table 23.10 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 for example, 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 (for example, ≥50% of population / habitat affected). For designated sites, integrity is compromised. There may be a change in the level of importance of the feature 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 (for example, 10% to 49% of population / habitat affected). There may be a change in the level of importance of this feature 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 (for example, 1% to 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 feature in terms of its importance in the context of the Project ZOI.
Negligible	Although there may be some effects on individuals, 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 features or the integrity of designated sites.

Determining significance - adverse and beneficial effects

23.8.3.6 Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost because of the Project. Beneficial effects are assessed as those where a resulting change from baseline improves the quality of the environment (for example, 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 23.10**.

23.8.3.7 Conservation status is defined as follows (as per CIEEM, 2018):

- *"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".*

23.8.3.8 SNH (2018) 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.

23.8.3.9 SNH (2018) 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 pragmatic test based on species ecology, ecological principles and population dynamics and maintains compatibility with the aims of European legislation and government policy.

23.8.3.10 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 most of the national population). SNH (2018) highlights the relevance of the NHZ as the basis for the geographical range selection when considering wind farms which do not have an impact on designated sites. The boundaries of NHZs have been drawn to reflect biogeographical differences between different zones, with a high level of environmental coherence within each zone, and the Project is within NHZ 9 (North East Coastal Plain).

23.8.3.11 NHZ-level population estimates for several breeding bird populations and estimates for key wintering waterfowl populations are available (Wilson *et al*., 2015).

23.8.3.12 In some cases, such as wintering goose and swan populations that are highly mobile, it may be necessary to undertake assessment at a much broader scale such as that of the entire Scottish population. Passage migrants and some wintering populations may show high levels of movement within the non-breeding season, and it is therefore difficult to define coherent regional populations with any confidence. This would be especially true where there is substantial site-based turnover in species' populations.

23.8.3.13 Alternative geographical areas to NHZs may be acceptable as the basis for assessment where there are definable regional or biogeographical populations that do not conform to NHZ boundaries (for example the distinct regional populations of red kites in Scotland). For some migratory species patterns of migration may determine the spatial scale at which impacts should be considered. In considering a species' distribution, it is important to consider its distribution across its range.

23.8.3.14 Regional populations may be of particular importance to a species conservation status at a national or international population because:

- they are core or 'stronghold' areas and the overall viability of the population is dependent on the maintenance of such areas; or
- they are 'edge of range' populations, which may (over time) be important in maintaining range as well as providing the potential for expansion or range shift.

23.8.3.15 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 Project, by:

- preventing a recovering species from reaching favourable conservation status, at a national or international level; or

- changing a species' status from favourable to unfavourable; or
- for a species that is already in decline, the assessment should focus on whether the proposal would undermine the potential for halting its decline and allowing it to recover to favourable conservation status.

23.8.3.16 A similar procedure is used where designated sites may be affected by the Project, 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".*

23.8.3.17 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.

23.8.3.18 The EIA Report should set out the consequences for the integrity of the species population in terms of its size, trend, distribution (where known) and the area of suitable habitat.

23.8.3.19 Whilst National Site Network, and their qualifying interest features are assessed within this Chapter as part of the wider EIA, conclusions on any potential adverse effects on site integrity based on identification of likely significant effects for HRA purposes are addressed in the **Report to Inform Appropriate Assessment** (submitted alongside this EIA Report).

23.9 Assessment of effects: construction stage

23.9.1 Introduction

23.9.1.1 This Section provides an assessment of the effects for terrestrial ecology and ornithology from the construction of the onshore elements of the Project.

23.9.1.2 The assessment methodology set out in **Section 23.8** has been applied to assess effects to terrestrial ecology and ornithology IEFs in relation to the Project.

23.9.1.3 The maximum assessment scenario relating to each of the identified IEFs are presented in **Table 23.7**. Where predicted effects are identified, an assessment of the magnitude of change for each effect has been completed based on the methodology provided in **Section 23.8**. The magnitude of change, and hence the significance of potential effects has been assessed on the assumption that the embedded environmental measures from **Table 23.8** have been implemented as part of the Project.

23.9.2 Loch of Strathbeg SPA / Ramsar: pink-footed goose and whooper swan

Land take / land cover change

23.9.2.1 Pink-footed geese were recorded regularly over winter within agricultural fields (considered to be functionally linked with the Loch of Strathbeg SPA) east of St Fergus within the Onshore Red Line Boundary within a potential ZOI of the Scotstown landfall only. Whooper swan were also recorded within this area on only two occasions across two winter season

surveys. This landfall will result in no permanent land cover change, except for a small access track (approximately 80m in length) connecting an existing track with the potential HDD (or similar trenchless technique) for pipeline crossing and landfall combined (if required). No pink-footed geese were recorded foraging in this location, with most records from the two large fields to the north of the existing track (with the nearest approximately 200m to the north).

23.9.2.2 Due to the extent of available habitat functionally linked within the SPA that would remain undisturbed during construction and decommissioning, availability of foraging habitat for both species is not considered to be a limiting factor.

23.9.2.3 Therefore, the magnitude of the impact that construction activities relating to the Project will have on the wintering population of pink-footed geese of international importance and whooper swan of Council area importance is negligible. The potential for very limited loss of habitat that would not threaten the long-term viability of the Loch of Strathbeg SPA / Ramsar population.

23.9.2.4 The Project embedded environmental measures (as shown in **Table 23.8**) include the sensitive placement of HDD (or similar trenchless technique) entry / exit pits outside the designated sites and minimising impact to functionally-linked land (M-002), as well as the commitment that all areas of temporary habitat loss will be reinstated wherever practicable (M-009) alongside an adherence to the Outline CEMP (M-063), to minimise land take to functionally-linked habitat.

23.9.2.5 Given the limited extent of direct habitat loss, the magnitude of change to the Loch of Strathbeg SPA pink-footed goose and whooper swan population considered of international importance is considered **Negligible** and the effect **Not Significant** in EIA terms.

Increased human presence, noise and vibration during construction

23.9.2.6 Pink-footed geese, and to a lesser extent whooper swan, were recorded over winter within agricultural fields (considered to be functionally linked with the Loch of Strathbeg SPA) east of St Fergus within a 500m ZOI of the Onshore Red Line Boundary with respect to Scotstown landfall only. Neither the Lunderton North or South landfalls were found to support wintering pink-footed geese or whooper swan and therefore these landfall(s) will enable spatial avoidance of those agricultural fields where both species have been recorded.

23.9.2.7 Both Pink-footed geese and whooper swan can be susceptible to disturbance from human activity and will react to dog walkers and vehicles, although over the winter birds are often found foraging close to roads as they become normalised to vehicular activity. Construction works for the Scotstown landfall location may therefore result in potential impact pathways in terms of disturbance effects to both species resulting in temporary displacement / loss of functionally linked habitat during the construction stage.

23.9.2.8 Pink-footed geese associated with the Loch of Strathbeg SPA have been shown to range extensively across a wide area (**Volume 3, Appendix 23.6** and **Volume 3, Appendix 23.7**), extending up to ~10km from Loch of Strathbeg, where they have been recorded utilising agricultural fields within a wider 130km^2. Whooper swan have not been recorded extensively, with only two records within a ZOI of the Onshore Red Line Boundary. Consequently, due to the availability of extensive foraging habitat (comprising improved pasture and arable fields) for both pink-footed geese and whooper swan outside the ZOI, the potential disturbance impact on these species from onshore construction activities undertaken at the Scotstown landfall is unlikely to reduce the fitness of a significant number of individuals.

23.9.2.9 Therefore, the magnitude of the impact that construction activities relating to the Project (at Scotstown landfall) will have on the wintering populations of pink-footed geese and whooper swan of international importance is considered to be low, indicating that there is potential for limited temporary disturbance or displacement that does not threaten that does not threaten the long-term viability of the Loch of Strathbeg SPA / Ramsar populations.

23.9.2.10 The Project embedded environmental measures (as shown in **Table 23.8**) includes a Bird Protection Plan which will embed measures through sensitive winter periods (M-135), pre-construction surveys (M-134) and presence of an ECOW (M-133) alongside an adhered to Outline CEMP (M-063), to ensure limited localised disturbance effects. Additional relevant commitments include a sensitive lighting design (M-011), reduction of working width of corridor close to sensitive features (M-027).

23.9.2.11 Given the embedded Bird Protection Plan and other measures outlined, the magnitude of change to the Loch of Strathbeg SPA pink-footed goose and whooper swan populations of international importance is considered **low** and effects **Not Significant** in EIA terms.

23.9.3 Rattray Head to Peterhead Local Nature Conservation Site (Winter bird assemblage)

Land take / land cover change

23.9.3.1 A wintering bird assemblage comprising curlew, lapwing, golden plover, redshank, snipe and Jack snipe was recorded over winter within a similar area to pink-footed geese within agricultural fields east of St Fergus within the Onshore Red Line Boundary and within a potential ZOI of Scotstown landfall only. This landfall option will result in no permanent land cover change, except for a small access track (approximately 80m in length) connecting an existing track with the potential HDD (or similar trenchless technique) for pipeline crossing and landfall combined (if required). No waders were recorded foraging in this location with the nearest records approximately 100m to the south, and most records from the two large fields to the north of the existing track. None of the species were regularly recorded in regionally significant numbers, with peak counts of golden plover (113), curlew (92), lapwing (74), redshank (6) and snipe (5).

23.9.3.2 Due to the extent of available habitat that would remain undisturbed within the LNCS during construction, availability of foraging habitat for winter waders associated with the LNCS is not considered to be a limiting factor.

23.9.3.3 Therefore, the magnitude of the impact that construction activities relating to the Project will have on the wintering wader assemblage of County / Council area importance is considered negligible, indicating that the potential is for very limited loss of habitat that does not threaten the long-term viability of the Rattray Head to Peterhead LNCS winter wader population.

23.9.3.4 The Project embedded environmental measures (as shown in **Table 23.8**) include sensitive placement of HDD (or similar trenchless technique) entry / exit pits outside the designated sites and minimising impact to functionally-linked land (M-002), as well as the commitment that all areas of temporary habitat loss will be reinstated wherever practicable (M-009) alongside adherence to the Outline CEMP (M-063), to minimise land take to supporting habitat.

23.9.3.5 Given the limited extent of direct habitat loss, the magnitude of change to the Rattray Head to Peterhead LNCS winter bird assemblage considered of County / Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Increased human presence, noise and vibration during construction

23.9.3.6 Construction works for the Scotstown landfall location may result in potential impact pathways in terms of disturbance effects to the Rattray Head to Peterhead LNCS winter bird assemblage resulting in temporary displacement / loss of supporting habitat during the construction stage.

23.9.3.7 Winter waders were recorded within several large fields within and around the Onshore Red Line Boundary, although none of the species were regularly recorded in regionally significant numbers. The local winter bird assemblage is likely to tolerate localised and temporary disturbance impacts given that the availability of foraging habitat both within the LNCS (and in the wider non-designated habitats) is not considered to be a limiting factor.

23.9.3.8 Therefore, the magnitude of the impact that construction activities relating to the Project will have on the wintering wader populations of County / Council area importance is considered low, indicating that there is potential for limited disturbance or displacement that does not threaten the long-term viability of the LNCS populations.

23.9.3.9 The Project embedded environmental measures (as shown in **Table 23.8**) includes a BPP which will embed measures through sensitive winter periods (M-135), pre-construction surveys (M-134) and presence of an ECOW (M-133) alongside adherence to the Outline CEMP (M-063), to ensure limited localised disturbance effects. Additional relevant commitments include a sensitive lighting design (M-011), reduction of working width of corridor close to sensitive features (M-027).

23.9.3.10 Given the embedded avoidance and mitigation strategy and other measures outlined, the magnitude of change to the LNCS winter bird assemblage of County / Council Area importance is considered **low** and effects **Not Significant** in EIA terms.

23.9.4 Rattray Head to Peterhead Local Nature Conservation Site (Sand dune communities)

Land take / land cover change

23.9.4.1 All three landfall locations are bordered on their eastern extents by Annex I dune habitats (fixed and mobile dunes), features of the Rattray Head to Peterhead LNCS. Within the Onshore Red Line Boundary, each of the three landfall locations overlap stretches of the dune system which extend approximately 200-300m from shoreline to landward side. The greatest extent of fragmentary dune slack communities (a more sensitive dune community, with greater floristic diversity) was recorded at the northerly Scotstown landfall location. However, none of these communities will be affected by the construction works at any of the land fall options.

23.9.4.2 To reduce the environmental impact of each of the potential landfall locations, HDD (or similar trenchless technique) will be incorporated, which will ensure that all dune communities within the LNCS are avoided. Therefore, the magnitude of the impact that construction activities relating to the Project will have on sand dune communities of County / Council area importance is considered neutral as there is no potential for loss of habitat.

23.9.4.3 The Project embedded environmental measures (as shown in **Table 23.8)** include the use of HDD (or similar trenchless technique) to minimise direct habitat loss to the sand dune communities (M-136), sensitive placement of HDD (or similar trenchless technique) entry / exit pits outside the designated sites and minimising impact to functionally-linked land (M-002), as well as the commitment that all areas of temporary habitat loss will be reinstated wherever practicable (M-009) alongside an adhered to Outline CEMP (M-063), to minimise land take.

23.9.4.4 Given there will be no direct habitat loss, the magnitude of change to the Rattray Head to Peterhead LNCS sand dune communities considered of County / Council area importance is considered **Neutral** and effects **Not Significant** in EIA terms.

Introduction of INNS

23.9.4.5 All dune grassland communities within the three landfall options will be avoided through the implementation of HDD (or similar trenchless technique). Nevertheless, at all working areas landward of the landfall locations, compliance with the Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012) regarding the use of tried and tested onshore invasive species control and biosecurity measures to avoid the spread of infested materials will be applied.

23.9.4.6 Therefore, the magnitude of the impact that construction activities relating to the Project will have on sand dune communities of County / Council area importance is considered negligible as there is limited potential for the introduction of INNS to dune communities.

23.9.4.7 The Project embedded environmental measures (as shown in **Table 23.8** include the application of INNS control measures (M-086), alongside adherence to the Outline CEMP (M-063), to minimise likelihood of introduction of invasive species.

23.9.4.8 Given the avoidance of works within the LNCS and the application of measures above, the magnitude of change to the Rattray Head to Peterhead LNCS sand dune communities considered of County / Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Changes in hydrology and pollution events

23.9.4.9 All dune grassland communities within the three landfall options will be avoided through the implementation of HDD (or similar trenchless technique). Additionally, at all working areas landward of the landfall locations, the following pollution control measures will be applied to ensure that any pollution pathways are avoided or minimised.

23.9.4.10 Therefore, the magnitude of the impact that construction activities relating to the Project will have on sand dune communities of County / Council area importance is considered negligible as there is limited potential for degradation or modification of dune communities.

23.9.4.11 The Project embedded environmental measures (as shown in **Table 23.8** include the application of a pollution control strategy (M-008), drainage design (M-080), stand-off distances from watercourses (M-124), production of a PPP (M-132), and potential use of geo-textiles or bog-matting where appropriate (M-148), alongside an adherence to the CEMP (M-063), to minimise likelihood of pollution pathways.

23.9.4.12 Given the avoidance of works within the LNCS and the application of measures above, the magnitude of change to the Rattray Head to Peterhead LNCS sand dune communities considered of County / Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.9.5 Ancient woodland

Land take / land cover change

23.9.5.1 The only ancient woodland within the Onshore Red Line Boundary is located along the River Ugie and this will be avoided through the implementation of HDD (or similar trenchless technique), with a minimum of 25m from any surface construction works and by the

trenchless crossing. Consequently, no ancient woodland will be affected by the construction works within the onshore export cable corridor.

23.9.5.2 Therefore, the magnitude of the impact that construction activities relating to the Project will have on ancient woodland of local importance within the Onshore Red Line Boundary is considered neutral as there is no potential for loss of habitat.

23.9.5.3 The Project embedded environmental measures (as shown in **Table 23.8)** include sensitive siting to avoid ancient woodland (M-002), use of HDD (or similar trenchless technique) to ensure avoidance of direct habitat loss to ancient woodland and application of stand-off buffers to ancient woodland (M-006) and sensitive placement of HDD (or similar trenchless technique) entry / exit pits outside ZOI from ancient woodland (M-027), will ensure avoidance of and direct or indirect habitat loss.

23.9.5.4 Given the avoidance of direct habitat loss and application of measures outlined above, the magnitude of change to ancient woodland considered of local area importance within the Onshore Red Line Boundary is considered **Neutral** and effects **Not Significant** in EIA terms.

Introduction of INNS

23.9.5.5 At all working areas landward of the landfall locations, compliance with the Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012) regarding the use of tried and tested onshore invasive species control and biosecurity measures to avoid the spread of infested materials will be applied.

23.9.5.6 Therefore, the magnitude of the impact that construction activities relating to the Project will have on ancient woodland of Local area importance within the Onshore Red Line Boundary is considered negligible as there is limited potential for degradation or modification of ancient woodland as a result of INNS.

23.9.5.7 The Project embedded environmental measures (as shown in **Table 23.8**) include the application of INNS control measures (M-086), alongside an adhered to Outline CEMP (M-063), to minimise likelihood of introduction of INNS.

23.9.5.8 Given the avoidance of works within the LNCS and the application of measures above, the magnitude of change to the ancient woodland considered of local importance within the Onshore Red Line Boundary is considered **Negligible** and effects **Not Significant** in EIA terms.

23.9.6 Otter

23.9.6.1 The construction of the Project has the potential to adversely affect otters directly or indirectly in several ways:

- physical damage or loss of resting sites, foraging or commuting habitat from construction.
- damage / destruction of routes potentially used by otters while crossing the Onshore Red Line Boundary (severance);
- disturbance caused by noise of construction of Project;
- direct injury or mortality; and
- changes in hydrology and pollution events.

23.9.6.2 The ecological baseline has been considered throughout the design process of the Project, including design meetings and communications with specialists providing input to subsequent design iterations.

23.9.6.3 This was with the aim to either eliminate or reduce the potential for any significant effects on features and following the 'mitigation hierarchy', as described in CIEEM guidance (CIEEM, 2018). This included consideration of areas with the potential to support protected species in relations to the location of the landfall(s), onshore export cable corridor, onshore substation and associated infrastructure, as far as practicable. The scheme design has enabled avoidance of suitable otter habitat within the Onshore Red Line Boundary.

Land take / land cover change (including loss or damage to resting sites)

23.9.6.4 Suitable otter habitat was recorded within the Onshore Red Line Boundary within the landfall area at Scotstown along the Annochie Burn and the Cuttie Burn, and the onshore export cable corridor along the River Ugie and Burn of Faichfield. However, all watercourses will be avoided through HDD (or similar trenchless technique) at each of these locations, with large stand-off buffers (between 50m to 100m in length) ensuring that there is no direct loss of suitable otter habitat. No resting sites were recorded within the Onshore Red Line Boundary, and whilst suitable habitat was recorded within the identified watercourses, none of this habitat was recorded within a ZOI of the construction works within any of the landfall(s) locations, onshore export cable corridor or onshore substations.

23.9.6.5 Therefore, the magnitude of the impact that construction activities relating to the Project will have on the otter population of local area importance is considered negligible as there is limited loss of suitable habitat and the conservation interest of the local otter population would not be threatened.

23.9.6.6 The Project embedded environmental measures (as shown in **Table 23.8**) include the application of HDD (or similar trenchless technique) to avoid sensitive features such as watercourses (M-027), and confirmation that there will be no 'within bank' crossings (M-156) which will avoid and minimise loss of suitable otter habitat.

23.9.6.7 Given the avoidance of watercourses listed and the application of measures above, the magnitude of change to the otter population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Fragmentation or severance of habitats

23.9.6.8 Severance describes the loss of continuity between habitats which may ultimately result in the isolation or fragmentation of discrete populations of species and result in changes to ecological processes such as population dynamics. However, due to the avoidance of suitable habitat as outlined above and the application of the Project embedded environmental measures listed above (as shown in **Table 23.8**), as well as the design measure to avoid causing fragmentation or severance of sensitive features such as watercourses with HDD (or similar trenchless technique) (M-027), the Project will avoid fragmentation of suitable otter habitat.

23.9.6.9 Given the avoidance of suitable habitat and the application of measures above, the magnitude of change to the otter population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Increased noise, light and disturbance during construction

23.9.6.10 No otter resting sites were recorded within a ZOI of the Project. Nevertheless, construction activity may give rise to the disturbance of otters foraging or commuting along suitable habitat and there may be impacts to their prey species – either from the placement of infrastructure or due to indirect effects such as noise.

23.9.6.11 However, construction related disturbance / displacement effects to otters within the Onshore Red Line Boundary are considered temporary and sporadic.

23.9.6.12 Otters are highly mobile and can move away from areas of disturbance as the larger watercourses within wider area are resource abundant for shelter. Due to the extent of available watercourses outside the Onshore Red Line Boundary that will remain undisturbed during construction, availability of foraging, commuting or sheltering habitat resource is not considered to be a limiting factor. Given the avoidance of watercourses, the application of measures above and given the temporary nature of the construction works, the magnitude of change to the otter population of local importance is considered **Negligible,** and effects **Not Significant** in EIA terms.

Direct mortality

23.9.6.13 Construction stages of the Project would bring an increase in the extent of vehicles and machinery within the Onshore Red Line Boundary, albeit avoiding proximity to suitable otter habitat as detailed above. Nevertheless, there is potential for otters to be hit by vehicles.

23.9.6.14 The Project embedded environmental measures (as shown in **Table 23.8**) include the application of speed limits (of no greater than 15mph) to all construction haul roads or access tracks (M-012), coverage of excavations or inclusion of ramps to allow means of escape for mammals (M-213), pre-construction ecology surveys will be undertaken to inform the requirement for any additional stand-off distances from identified resting sites (M-134), and the presence of an ecological clerk of works (ECOW) (M-133) will ensure that the risk of direct mortality to otters is avoided and / or minimised. Additionally, to prevent (non-significant) adverse impacts on otter (which is an EPS) an Onshore SPP (M-135) will be developed and implemented for all stages of the Project construction.

23.9.6.15 Given the avoidance of watercourses listed and the application of measures above, the magnitude of change to the otter population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Changes in hydrology and pollution events

23.9.6.16 All watercourse crossings (comprising Annachie Burn, Cuttie Burn, the River Ugie, all tributaries of the River Ugie and the Burn of Faichfield) will be via HDD (or similar trenchless technique) to minimise the risk of pollution to watercourses. A single field drain will be crossed via trenched crossing (approximately 350m to the north of the River Ugie); however, this feature provides no hydrological connectivity with the River Ugie or other watercourses.

23.9.6.17 The Project embedded environmental measures additional to those listed above (as shown in **Table 23.8**) include the application of a pollution control strategy (M-008), stand-off distances from watercourses (M-124) and the implementation of PPP (M-132) to ensure that pollution events are avoided and / or minimised.

23.9.6.18 Given the avoidance of watercourses listed and the application of measures above, the magnitude of change to the otter population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.9.7 Badger

23.9.7.1 The construction of the Project has the potential to adversely affect badgers directly or indirectly in a number of ways:

- physical damage or loss of setts or foraging habitat from construction;
- damage / destruction of routes potentially used by badgers while crossing the Onshore Red Line Boundary (severance);
- disturbance (caused by noise and lighting) during construction of Project; and
- direct injury or mortality.

23.9.7.2 The ecological baseline has been considered throughout the design process of the Project, including design meetings and communications with specialists providing input to subsequent design iterations. This was with the aim to either eliminate or reduce the potential for any significant effects on features and following the 'mitigation hierarchy', as described in CIEEM guidance (CIEEM, 2018). This included consideration of areas with the potential to support protected species in relations to the location of the landfall(s), onshore export cable corridor, onshore substations and associated infrastructure, as far as practicable. The scheme design has enabled avoidance of all identified badger setts.

Land take / land cover change (including loss or damage to setts)

23.9.7.3 Design meetings have configured the Project layout to avoid the known badger setts by a minimum of 30m. Two setts were recorded within indicative trenchless crossing areas; however micro-siting will ensure that the loss or damage to these setts is avoided. If this is not possible, then a licence application to NatureScot for disturbance to badgers will be required. This will be included within the Onshore SPP (M-135).

23.9.7.4 The Project will result in the permanent loss of habitat at the onshore substation site, which could lead to the loss of some foraging habitat, although the availability of similar farmland within the immediate and wider area means that habitat loss is unlikely to be a limiting factor.

23.9.7.5 The Project embedded environmental measures (as shown in **Table 23.8**) include the avoidance of sensitive features including badger setts (M-027), which will be overseen by an ECOW (M-133) who will ensure that the loss or damage to badger setts is avoided. Additionally, to prevent (non-significant) adverse impacts to badger (which is legally protected) an Onshore SPP (M-135) will be developed and implemented for all stages of the Project construction.

23.9.7.6 With the application of measures above, the magnitude of change to the badger population considered of local importance is considered **low** and effects **Not Significant** in EIA terms.

Fragmentation or severance of habitats

23.9.7.7 The Project may result in temporary displacement of available foraging habitat during the construction stage but is unlikely to sever access to any good quality badger habitat, and it is highly unlikely that the Project would prevent badgers crossing between different areas during construction.

23.9.7.8 On this basis, the magnitude of change to the badger population considered of local importance is considered **low** and effects **Not Significant** in EIA terms.

Increased noise, lighting and disturbance during construction

23.9.7.9 Suitable badger habitat was recorded across the Onshore Red Line Boundary, primarily within the onshore export cable corridor and onshore substation site. However, no setts were recorded within a ZOI of proposed works. Nevertheless, construction activity may give rise to the disturbance of badgers foraging or commuting within farmland within the vicinity of construction stage works.

23.9.7.10 Badgers are highly mobile and can move away from areas of disturbance, particularly within the wider area, which offers abundant sheltering habitat along scrubby borders, hedgerows, treelines and woodland. Due to the availability of suitable foraging and setting habitat across the Onshore Red Line Boundary and the wider area that will remain undisturbed during construction, availability of foraging, commuting or sheltering habitat resource is not considered to be a limiting factor. Based on the assessments and outline of measures detailed in the preceding assessment Sections, construction related disturbance / displacement effects to badgers within the Onshore Red Line Boundary are considered temporary and sporadic.

23.9.7.11 Badgers are highly mobile and can move away from areas of disturbance, particularly within the wider area, which offers abundant sheltering habitat along scrubby borders, hedgerows, treelines and woodland. Due to the availability of suitable foraging and setting habitat across the Onshore Red Line Boundary and the wider area that will remain undisturbed during construction, availability of foraging, commuting or sheltering habitat resource is not considered to be a limiting factor. In order to avoid impacts to foraging animals, the Project embedded environmental measures (as shown in **Table 23.8**) include the avoidance of work during hours of darkness (M-214).

23.9.7.12 Given the avoidance of disturbance impacts to badger setts, the application of measures above and given the temporary nature of the construction works, the magnitude of change to the badger population of local importance is considered **low** and effects **Not Significant** in EIA terms.

Direct mortality

23.9.7.13 Construction stages of the Project would bring an increase in the extent of vehicles and machinery within the Onshore Red Line Boundary. Vehicular traffic within the Onshore Red Line Boundary will increase (from pre-construction baseline) leading to a potential threat of individual badgers being injured or killed by vehicles operating.

23.9.7.14 The Project embedded environmental measures (as shown in **Table 23.8**) include the application of speed limits (of no greater than 15mph) to all construction haul roads or access tracks (M-012), and pre-construction ecology surveys will be undertaken to inform the requirement for any additional stand-off distances from badger setts (M-134) and the presence of an ECOW (M-133) will ensure that the risk of direct mortality to badgers is avoided and / or minimised. Additionally, to prevent (non-significant) adverse impacts to badger (which is legally protected) an Onshore SPP (M-135) will be developed and implemented for all stages of the Project construction.

23.9.7.15 With the application of measures above, the magnitude of change to the badger population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.9.8 Bats

Artificial Light at Night (ALAN)

23.9.8.1 As described in guidance from the Bat Conservation Trust (BCT) and Institute of Lighting Professionals (ILP) (BCT and ILP, 2023), ALAN can affect bats at roosting sites, when foraging, and travelling across the landscape by:

- Attracting prey species which could in turn attract bats, but in illuminated areas bats would be at greater risk of predation; this could also alter population dynamics from areas where prey and bats have been displaced.
- Deterring bats from using illuminated roost features due to increased risk of predation.
- Creating a barrier to movement between roosts and foraging sites and wider habitats.

23.9.8.2 It is anticipated that construction works will be undertaken during hours of daylight with a requirement only for local task lighting. However, if night or 24-hour working is required, such as may be required during trenchless crossing operations, then portable directional task lighting will be deployed. Further detail regarding construction lighting is provided in **Volume 4: Outline Construction Environmental Management Plan**.

23.9.8.3 External lighting of the construction site will be designed and positioned to:

- provide the necessary levels for safe working;
- minimise light spillage and / or light pollution; and
- avoid disturbance to natural habitats where possible, including sensitive wildlife corridors.

23.9.8.4 Importantly, core landscape features of importance for bats in the landscape such as the River Ugie and woodland, the Burn of Faichfield and woodland corridors at East and West Dens are all avoided and would not be subject to any artificial light overspill.

23.9.8.5 These effects of ALAN would mainly relate to the active season and not over winter when prey is scarcer and bats hibernate. Effects would be temporary (i.e. over the construction phases) and reversible. There would be no barrier effect because of the avoidance of core landscape features (identified above) and applied stand-off distances and localised nature of lighting of works areas.

23.9.8.6 The Project embedded environmental measures (as shown in **Table 23.8**) include a sensitive lighting design plan (M-011), informed by the joint guidance provided by the Bat Conservation Trust and Institution of Lighting Professionals (2018), as provided in the CEMP (M-063), commitment to work during the hours of darkness where practicable (M-214), and provision of an ECOW (to ensure micro-siting of site infrastructure minimises lighting overspill of habitats likely to support bats).

23.9.8.7 With the application of these measures, the magnitude of change to the bat population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Works affecting roosts / roosting bats

23.9.8.8 A Preliminary Roost Assessment (PRA) undertaken within the Onshore Red Line Boundary identified nine trees that have Bat Roost Potential (BRP) – two with high potential, four with moderate potential and three with low potential. It is anticipated that all nine trees with PRFs would be retained within the Onshore Red Line Boundary and surrounding 30m area. Additionally, eight buildings with roost suitability and hibernation suitability were recorded

within the Onshore Red Line Boundary – two with high potential, five with moderate potential and one with low potential. However, there would be no planned works to these buildings as part of the Project – therefore there would be no changes to the physical structure of these roosts.

23.9.8.9 Within the onshore export cable corridor, it is assumed at this stage that all trees will be removed due to construction of the cables. Any vegetation within the 'open cut trenched crossing' areas are also assumed to require removal. However, it is acknowledged that appropriate mitigation will be taken to avoid unnecessary loss of any moderate or high-quality arboricultural features (as defined in **Volume 3, Appendix 23.10**) during the detailed design process, where practicable.

23.9.8.10 The Project embedded environmental measures (as shown in **Table 23.8**) include retention and minimisation of vegetation (M-006), avoidance of sensitive features (including PRFs) through reduction of the working corridor wherever possible (M-027), avoidance of fragmentation of woodland or other sensitive semi-natural habitats (M-085), pre-construction surveys of PRFs subject to tree-felling (M-215) and oversight by a bat licensed surveyor of tree felling of any PRFs (M-216).

23.9.8.11 With the application of these measures, the magnitude of change to the bat population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Severance of suitable foraging habitat

23.9.8.12 The Project has avoided loss or severance of riparian corridors, ancient woodland and / or broadleaf woodland habitats and the great extent of the landfall(s), onshore export cable corridor and onshore substation sites are located in agricultural habitats. As such, habitat potential for commuting, foraging and roosting bats has been maintained within the Onshore Red Line Boundary.

23.9.8.13 The Project has been designed to limit tree and / or hedgerow removal as shown on the Tree Removal and Protection Plan (Figure 1 of **Volume 3, Appendix 23.10**). The Project would potentially result in the removal or partial removal of 22 individual trees, six groups, 20 partial groups and 12 partial hedges. Hedgerows were recorded regularly along field boundaries across the Onshore Red Line Boundary and were predominantly assessed as being of low quality.

23.9.8.14 The loss of 12 partial (gappy or defunct) hedgerows identified of largely low quality may provide some limited foraging and commuting habitat for bats within an agricultural setting. The removal of this vegetation is unlikely to materially affect the flight lines along these field boundaries and a very small proportion of the available commuting resources across the Onshore Red Line Boundary.

23.9.8.15 The Project embedded environmental measures (as shown in **Table 23.8**) include the retention of vegetation wherever possible (M-006), reinstatement of areas of temporary habitat loss (M-009), avoidance of causing woodland fragmentation, semi-natural land and sensitive habitats (M-085). Additionally, tree and hedgerow loss will be compensated through the implementation of a landscape design strategy including new tree planting as discussed in **Volume 4: Outline Landscape and Architectural Strategy**.

23.9.8.16 With the application of these embedded environmental measures, the magnitude of change to the bat population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Direct mortality

23.9.8.17 It is also possible that construction works required to fell trees with PRFs (outwith the working corridor within the wider Onshore Red Line Boundary), which could result in injury to or killing of bats that may be roosting within a feature and remain undetected.

23.9.8.18 The Project embedded environmental measures (as shown in **Table 23.8**) include a pre-construction survey of any PRFs (M-215) and oversight of a bat licensed surveyor during the felling (M-216). Additionally, an Onshore SPP (M-135) will be developed and implemented for all stages of the Project construction. With the application of these measures above, the magnitude of change to the bat population considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.9.9 Freshwater fish

Changes in hydrology and pollution events

23.9.9.1 Given the potential for impact pathways to the River Ugie and its tributaries, which are known to support Atlantic salmon and sea trout populations, there is potential for release of silt / sediment and or accidental pollution (for example, oil spill from plant / equipment), which can harm fish directly or damage fish habitats, for example by smothering spawning redds with silt or discharging toxic pollutants.

23.9.9.2 The ecological baseline has been considered throughout the design process of the Project, including design meetings and communications with specialists providing input to subsequent design iterations. Consequently, all watercourse crossings (comprising Annachie Burn, Cuttie Burn, the River Ugie, all tributaries of the River Ugie and the Burn of Faichfield) will be crossed via HDD (or similar trenchless technique) to minimise the risk of pollution to watercourses. A single field drain will be crossed via trenched crossing (approximately 350m to the north of the River Ugie) however this feature provides no hydrological connectivity with the River Ugie or other watercourses.

23.9.9.3 The proposed works in proximity to all watercourses would be conducted in a manner that minimises any potential impacts on fish populations and their habitats, through the implementation of the following embedded environmental measures (as shown in **Table 23.8**): Pollution Control Strategy (M-008), Drainage design (M-080), Stand-off buffers from River Ugie and tributaries (M-124), Trenchless crossing (M-126) and Pollution Prevention Plan (M-132).

23.9.9.4 Given the avoidance of watercourses listed and the application of measures above, the magnitude of change to the Atlantic salmon and sea trout populations considered of Regional importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Infrastructure placement - watercourse buffers

23.9.9.5 All infrastructure and associated construction activities will be located 100m from any watercourse wherever possible, and a minimum of 50m distance where 100m can be demonstrated to be undeliverable (M-126). This includes onshore export cable trenches, soil stockpiles, access tracks, temporary construction related activities such as plant, refuelling, storage of hazardous materials, cement batching, waste storage, concrete preparation, wheel washing / washout areas, and temporary construction compound areas.

23.9.9.6 Given the application of measures above, the magnitude of change to the Atlantic salmon and sea trout populations considered of Regional importance is considered **Negligible** and effects **Not Significant** in EIA terms.

Horizontal directional drilling (HDD) (or similar trenchless technique) crossings of Water Framework Directive (WFD) waterbodies

23.9.9.7 River WFD waterbodies (River Ugie and Burn of Faichfield) and their tributary watercourses (within the River Ugie catchment) will be crossed using trenchless construction techniques for underground export cable installation, such as HDD (or similar trenchless technique) to help minimise potential impacts on water quality at these locations (M-126). The depth of the trenchless crossing will be such that the riverbed and watercourse is undisturbed by construction activities. Specific construction method statements will be prepared, incorporating the following:

- entry and / or exit pits for trenchless crossings will be located outside of the fluvial floodplain to help minimise potential flood risk and protect construction staff;
- during construction, a programme of visual inspections will be undertaken to ensure that the potential effects on the River Ugie and its tributaries are appropriately monitored;
- the HDD (or similar trenchless technique) will be undertaken in accordance with the Drilling Contractors Association (DCA) Technical Guidelines, Information and Recommendations for the Planning, Construction and Documentation of HDD Projects (DCA, 2018), and other relevant industry codes, standards, and guidelines;
- stockpiles of topsoil and subsoil will be present for the shortest practicable timeframe, with stockpiles being reinstated as the construction work progresses to minimise areas of exposed soil and any associated silt laden run-off;
- any temporary construction traffic crossings will be in place for the minimal time possible; and
- all permanent onshore export cable crossings will pass beneath the bed of watercourses (there will be no 'within bank' crossings).

23.9.9.8 The Project embedded environmental measures additional to those listed above (as shown in **Table 23.8**) include the application of a pollution control strategy (M-008), and the implementation of PPP (M-132) to ensure that pollution events are avoided and / or minimised.

23.9.9.9 Given the avoidance of watercourses listed and the application of measures above, the magnitude of change to the Atlantic salmon and sea trout populations considered of Regional importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10 Assessment of effects: operation and maintenance stage

23.10.1 Introduction

23.10.1.1 This Section provides an assessment of the effects for terrestrial ecology and ornithology from the O&M of the onshore elements of the Project.

23.10.1.2 The assessment methodology set out in **Section 23.8** has been applied to assess effects to terrestrial ecology and ornithology from the Project.

23.10.2 Loch of Strathbeg SPA / Ramsar: Pink-footed goose and whooper swan

Increased noise and disturbance

23.10.2.1 No operational activities will be undertaken within the landfall(s) (specifically the Scotstown landfall). However, occasional maintenance may comprise ad-hoc visits, including activities for inspection / maintenance purposes. Unscheduled maintenance or emergency repair visits may involve the presence of light vehicles, that would likely gain access using existing field and site accesses. Infrequently, cables may be required to be replaced, and the use of an occasional heavy goods vehicle may be utilised, depending on the nature of the repair. Subject to location, cable replacement may involve creating a temporary access using trackway or another temporary access road type, excavating to confirm the cable fault location using excavation equipment and excavating the required length of cable to enable repair.

23.10.2.2 O&M works activities will be relatively low frequency in occurrence, generally localised in scale, and involve low noise generation. Where more intrusive works are required within a ZOI of potentially sensitive areas for pink-footed geese and whooper swan, impact avoidance and mitigation measures will be implemented.

23.10.2.3 The Project embedded environmental measures (as shown in **Table 23.8**) include the provision that permanent rights or servitude for the onshore export cable corridor will be kept to the minimum width needed for safe access for cable maintenance or replacement purposes during operation of the Project (M-066), which will ensure that any disturbance impacts are minimised during operation.

23.10.2.4 Given the temporary and sporadic nature of any maintenance works during the operational stage and the application of measures above, the magnitude of change to pink-footed geese and whooper swan populations considered of international importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10.3 Rattray Head to Peterhead local nature conservation site (winter bird assemblage)

Increased noise and disturbance

23.10.3.1 The assessment provided in **Section 23.9.2** applies to the Rattray Head to Peterhead LNCS winter bird assemblage.

23.10.3.2 Given the temporary and sporadic nature of any maintenance works during the operational stage and the application of measures above, the magnitude of change to the Rattray Head to Peterhead LNCS winter bird assemblage considered of Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10.4 Rattray Head to Peterhead Local Nature Conservation Site (Sand dune communities)

Land take / land cover change and hydrological change and pollution events

23.10.4.1 It is anticipated that the operational stage of the Project would not result in any habitat loss or degradation to sand dune communities within the LNCS. There should also be no pollution or sedimentation to running water, unless major maintenance work was required

or there was an accidental spillage of oil, concrete or other materials during maintenance of below ground infrastructure. However, good practice would be adopted to minimise the potential for pollution or sedimentation events during maintenance works.

23.10.4.2 The Project embedded environmental measures (as shown in **Table 23.8**) include a Pollution control strategy (M-008), which will be in line with good practice and in accordance with CAR licence regulations, pollution prevention plans and emergency plans to be drawn up to detail how ground and surface waters and the ecological features they support, would be protected during operation.

23.10.4.3 Given the temporary and sporadic nature of any maintenance works during the operational stage and the application of good practice measures, the magnitude of change to the Rattray Head to Peterhead LNCS sand dune communities considered of Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10.5 Ancient woodland

Land take / land cover change and hydrological change and pollution events

23.10.5.1 It is anticipated that the operational stage of the Project would not result in any habitat loss or degradation to ancient woodland.

23.10.5.2 The Project embedded environmental measures (as shown in **Table 23.8**) include a Pollution control strategy (M-008), which will be in line with good practice and in accordance with CAR licence regulations, pollution prevention plans and emergency plans to be drawn up to detail how ground and surface waters and the ecological features they support, would be protected during operation.

23.10.5.3 Given the temporary and sporadic nature of any maintenance works during the operational stage and the application of measures outlined above, the magnitude of change to ancient woodland considered of Council area importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10.6 Otter, badger and bats

Increased noise and disturbance

23.10.6.1 No otter resting sites, watercourses likely to support otters, or badger setts were identified within a ZOI of potential active O&M working areas.

23.10.6.2 However, should any maintenance activities be required in proximity to watercourses suitable to support otter resting sites, a suitably qualified ecologist (SQE) will be employed to assess otter activity in proximity to maintenance area and assess the types of works taking place. If works are intrusive, for example, they require vehicle access outside existing access tracks or require excavation work, the SQE will advise on appropriate vehicle routes to the works and establish a protection zone, if required. Works activities are likely to be relatively low frequency in occurrence, localised in scale, and involve low noise generation. These provisions will be set out in Onshore SPPs.

23.10.6.3 Considering the Project embedded environmental measures (as shown in **Table 23.8**), which include an Onshore SPP (M-135), impacts to otters and badgers would be avoided or minimised during operation.

23.10.6.4 Given the temporary and sporadic nature of any maintenance works during the operational stage and the application of embedded environmental measures, the magnitude of change

to both otter and badger populations considered of local importance is considered **Negligible** and effects **Not Significant** in EIA terms.

23.10.7 Freshwater fish

Electromagnetic fields on fish

23.10.7.1 The maximum design scenario parameters that have been identified to be relevant to EMF are outlined in **Chapter 9: Electromagnetic Fields** (Table 9.5 maximum design scenario for impacts on EMF) and are in line with the project design envelope (**Chapter 4: Project Description**).

23.10.7.2 An offshore scenario has been adopted as the worst case for this analysis. The burial depth for offshore cables is defined by the Project as typically between 1m and 2m below the seabed, where burial is feasible. For watercourse crossings, the installation depth of export cable ducts is not yet specified, as it depends on site-specific factors such as topology, geology, and the characteristics of the crossing feature.

23.10.7.3 It is expected that onshore export cables will be buried deeper beneath riverbeds at watercourse crossings than the offshore minimum burial depth of 1m. Consequently, EMF effects at the riverbed will be lower than at the seabed. Therefore, the offshore scenario is considered more onerous than the onshore scenario in terms of cable burial depth.

23.10.7.4 Furthermore, the onshore and offshore export cable design parameters are also broadly similar in terms of their voltages and currents (see **Chapter 4: Project Description**).

23.10.7.5 During the operation stage, EMF will be generated through the underground electrical cabling at watercourse crossings, notably the River Ugie. EMF are produced by two primary components: electric fields (E-fields) and magnetic fields (B-fields). The intensity of these fields is determined by the current and voltage present in the conductors.

23.10.7.6 Salmonid species are thought to use the earth's magnetic field for navigation during migration, a process referred to as magnetoreception. Studies have found iron-rich particles, such as magnetite, in salmonid tissues, particularly in the lateral line and nervous system, may play a role in detecting geomagnetic signals (Moore *et al*. 1990). Behavioural experiments indicate that salmonids alter their orientation in response to magnetic fields. Consequently, EMF from underwater cables have the potential to affect these navigation mechanisms during migration.

23.10.7.7 When conductors like fish or moving water intersect a magnetic field, they generate induced E-fields that electrosensitive species may detect. The EMF from underground cables may disrupt electro- or magneto-sensitive fish by interfering with their navigation and predator-prey behaviours (Nqvist *et a*l. 2020).

23.10.7.8 With respect to **Chapter 13: Fish Ecology**, background measurements of the magnetic field are approximately 50μT across the North Sea (similar to the global average), and the naturally occurring electric field in the North Sea is approximately 25μV/m. The calculated background magnetic field in the OAA is approximately 53μT based on the World Magnetic Model (NOAA, 2025), slightly higher than the world average (50μT).

23.10.7.9 FeAST gives a benchmark of elevated local electric field of 1V/m above ambient, or local magnetic field of 10μT due to anthropogenic means. The potential EMF produced by the Project has been modelled and is reported in **Chapter 9: Electromagnetic Fields** Modelling shows the 50μT zone in the horizontal dimension is limited to ~ 0.8m around the 66kV array cables, ~1.1m around a monopole HVDC cable and ~ 11m around any single pole of a bipole cable.

23.10.7.10 Research on EMFs from onshore cabling is limited, but studies show that EMF from subsea cables do not significantly impact the behaviour, migration, or population of migratory species like salmonids. While minor short-term behavioural changes, such as lingering near cables, have been observed, overall tolerance is high and no disruptions to migration have been reported (Armstrong *et al.,* 2015, Kavet *et al*., 2016, Gill *et al*., 2005, Wilhelmsson *et al.,* 2010). However, given the lack of research on the impacts of EMF from cabling buried under watercourses it is difficult to completely rule out the possibility of an impact, particularly as fish are likely to be exposed for longer periods of time while within a watercourse in comparison to individuals passing over a subsea cable during migration.

23.10.7.11 The magnetic field weakens with distance from the cable. Evidence from National Grid monitoring indicates that 5m from the top of the cable, the field is about 12.5% of its original strength, and at 10m, it is roughly 3.75% (National Grid, 2025). The field approaches zero at large distances.

23.10.7.12 In view of the Project embedded environmental measures (outlined in **Table 23.8**), which include HDD (or similar trenchless technique) (M-005) for crossing, and considering evidence from subsea cables indicating that behavioural changes are minimal, the magnitude of change to freshwater fish populations considered of Council area importance is assessed as **Negligible,** and effects deemed **Not Significant** in EIA terms.

23.11 Assessment of effects: decommissioning stage

23.11.1.1 Impacts to all identified IEFs from decommissioning works are anticipated to be of a similar nature to the construction stage impacts but of lower magnitude due to sub-surface elements being left in situ and this stage being shorter in duration.

23.11.1.2 Prior to decommissioning taking place, an onshore decommissioning plan will be submitted and agreed Aberdeenshire Council before decommissioning works commence. It is anticipated this will include environmental measures to mitigate any decommissioning related effects on all IEFs. Decommissioning effects for all identified IEFs are therefore considered to be **Not Significant** in EIA terms.

23.12 Summary of effects

23.12.1.1 A summary of the effects arising from the construction, O&M and decommissioning stages of the Project in relation to terrestrial ecology and ornithology are summarised in **Table 23.11**.

Table 23.11 Summary of effects during the construction, operation and maintenance and decommissioning stage of the Project on terrestrial ecology and ornithology

Receptor	Importance / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
Construction and decommissioning					
Loch of Strathbeg SPA / Ramsar: Pink-footed goose and whooper swan	**County / Council area**	Land take / land cover change during construction at the landfall(s) and onshore export cables leading to loss of functionally linked non-designated habitat.	M-002 M-009 M-063	**Negligible**	**Not Significant.**
		Increased human presence, noise and vibration, and increased light levels during construction at the landfall(s) and onshore export cables leading to disturbance and displacement effects and potential loss of foraging habitat during winter months.	M-011 M-027 M-063 M-133 M-134	**Low**	**Not Significant.**
Rattray Head to Peterhead LNCS: Winter bird assemblage	**County / Council area**	Land take / land cover change during construction at the landfall(s) and laydown of onshore export cables leading to loss of habitat supporting wintering bird assemblage.	M-002 M-009 M-063	**Negligible**	**Not Significant.**
		Increased human presence, noise and vibration, and increased light levels during construction at the landfall(s) and onshore export cables leading to disturbance and displacement effects and potential loss of foraging habitat during winter months.	M-011 M-027 M-063 M-133 M-134	**Low**	**Not Significant.**
Rattray Head to Peterhead LNCS: Sand dune communities	**County / Council area**	Temporary and permanent land take / land cover change during construction at the landfall(s) and onshore export cables leading to permanent and/or temporary loss or damage of habitat.	M-002 M-009 M-063 M-136	**Neutral**	**Not Significant.**
		Introduction of INNS during construction activities leading to degraded vegetation communities.	M-063 M-086	**Negligible**	**Not Significant.**

Receptor	Importance / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
		Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall(s), onshore export cables leading to injury or direct mortality of species through pollution events.	M-008 M-063 M-080 M-124 M-132 M-148	**Negligible**	**Not Significant.**
Ancient woodland	**Regional**	Temporary and permanent land take / land cover change during construction at onshore export cables leading to permanent and temporary loss or damage of habitat.	M-002 M-006 M027	**Neutral**	**Not Significant.**
		Introduction of INNS during construction activities leading to degraded vegetation communities.	M-063 M-086	**Negligible**	**Not Significant.**
Otter, **Badger**	**Local** **Local**	Temporary and permanent land take / land cover change during construction at the landfall(s) and onshore export cables leading to permanent and temporary loss or damage of habitat or inadvertent damage to breeding sites or resting places.	M-027 M-133 M-135 M-156	**Negligible** **Low**	**Not Significant.**
		Temporary and permanent land take / land cover change during construction at the landfall(s) and onshore export cables leading to fragmentation of habitats or temporary severance of habitat and commuting routes.	M-027	**Negligible** **Low**	**Not Significant.**
		Increased human presence, noise and vibration, and increased light levels during construction stage leading to disturbance and displacement effects.	M-214	**Negligible** **Low**	**Not Significant.**
		Use of plant machinery / vehicles during construction at the landfall(s), laydown of onshore export cables and onshore substations leading to potential for injury or direct mortality of species through direct contact.	M-012 M-133 M-134 M-135 M-213	**Negligible** **Negligible**	**Not Significant.**

Receptor	Importance / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
		Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall(s), onshore export cables leading to injury or direct mortality of species through pollution events.	M-008 M-124 M-132	**Negligible** **Negligible**	**Not Significant.**
Bats	**Local**	Artificial light at night with potential for disturbance and displacement effects.	M-011 M-063	**Negligible**	**Not Significant.**
		Works affecting roosts / roosting bats with potential for disturbance and displacement effects.	M-006 M-027 M-085 M-215 M-216	**Negligible**	**Not Significant.**
		Temporary and permanent land take / land cover change during construction at onshore export cables leading to a loss of roost resources (i.e. PRFs).	M-006 M-027 M-085 M-215 M-216	**Negligible**	**Not Significant.**
		Temporary and permanent land take / land cover change during construction at onshore export cables leading to severance of suitable foraging habitat.	M-006 M-009 M-085	**Negligible**	**Not Significant.**
		Temporary and permanent land take / land cover change during construction at onshore export cables leading to injury or direct mortality of species through direct contact.	M-135 M-215 M-216	**Negligible**	**Not Significant.**
Freshwater fish	**Local**	Spillage or leakage of fuels, lubricants or other chemicals during construction at the landfall(s), onshore export cables leading to injury or direct mortality of species through pollution events.	M-008 M-080 M-124 M-126 M-132	**Negligible**	**Not Significant.**

Receptor	Importance / value	Activity and potential effect	Embedded environmental measures	Magnitude of effect	Significance of effects
		Infrastructure placement during construction activities leading to pollution events.	M-126	**Negligible**	**Not Significant.**
		HDD (or similar trenchless technique) crossings leading to pollution events.	M-008 M-132	**Negligible**	**Not Significant.**
O&M					
Loch of Strathbeg SPA / Ramsar: Pink-footed goose and whooper swan	**County / Council area**	Increased human presence, noise and vibration, and increased light levels during the O&M stage at the landfall(s) and onshore export cables, leading to disturbance and displacement effects and effective loss of foraging habitat during winter months.	M-066	**Negligible**	**Not Significant.**
Rattray Head to Peterhead LNCS: Winter bird assemblage	**County / Council area**		M-066	**Negligible**	**Not Significant.**
Rattray Head to Peterhead LNCS: Sand dune communities	**County / Council area**	Spillage or leakage of fuels, lubricants or other chemicals during O&M at the landfall(s), onshore export cables and onshore substations leading to accidental contamination entering watercourses or groundwater and potentially degraded vegetation communities.	M-008	**Negligible**	**Not Significant.**
Ancient woodland	**County / Council area**		M-008	**Negligible**	**Not Significant.**
Otter, Badger, bats	**Local**	Operational activities such as vehicular traffic and maintenance works leading to injury or direct mortality of species through direct contact.	M-135	**Negligible**	**Not Significant.**
Freshwater fish	**County / Council area**	EMF leading to fish disturbance or changes to fish behaviour	M-006	**Negligible**	**Not Significant.**

23.13 Transboundary effects

23.13.1.1 Transboundary effects arise when impacts from a development with one European Economic Area (EEA) State affects the environment of another EEA State(s). A screening of transboundary effects has been carried out and is presented in Appendix 4B of the Scoping Report (MarramWind Limited, 2023).

23.13.1.2 Based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely, there are not considered to be any transboundary effects on terrestrial ecology and ornithology features from the Project.

23.14 Inter-related effects

23.14.1.1 A description and assessment of the likely inter-related effects arising from the Project on terrestrial ecology and ornithology is provided in **Chapter 32: Inter-Related Effects**.

23.15 Assessment of cumulative effects

23.15.1.1 A description and assessment of the cumulative effects arising from the Project on terrestrial ecology and ornithology is provided in **Chapter 33: Cumulative Effects Assessment**.

23.16 Summary of residual likely significant effects

23.16.1.1 There are no residual likely significant effects on terrestrial ecology and ornithology receptors assessed in this Chapter have been identified.

23.17 References

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23.18 Glossary of terms and abbreviations

23.18.1 Abbreviations

Acronym	Definition
AWI	Ancient Woodland Inventory
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
cm	Centimetres
cSAC	Candidate Special Area of Conservation
DCA	Drilling Contractors Association
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EPS	European Protected Species
FOC	Fibre Optic Cable
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HDD	Horizontal Direction Drilling
HRA	Habitats Regulations Appraisal
IEF	Important Ecological Feature
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
m	Metres
MD-LOT	Marine Directorate Licensing Operations Team
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NELBAP	North East Local Biodiversity Action Plan
NHZ	Natural Heritage Zone
NNR	National Nature Reserve
NPF4	National Planning Framework 4

Acronym	Definition
NVC	National Vegetation Classification
pSPA	Potential Special Protection Area
RSPB	Royal Society for Protection of Birds
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SCI	Sites of Community Importance
SEPA	Scottish Environmental Protection Agency
SNAP	Scottish National Adaptation Plan
SPA	Special Protection Area
SPP	Species Protection Plan
SQE	Suitably qualified ecologist
SSSI	Site of Special Scientific Interest
WFD	Water Framework Directive
ZOI	Zone of Influence

23.18.2 Glossary of terms

Term	Definition
Appropriate Assessment	An assessment to determine the implications of a plan or project on relevant national site network sites in view of that site's conservation objectives. An Appropriate Assessment forms part of the HRA and is required when a plan or project (either alone or in-combination with other plans or projects) is likely to have a significant effect on a national site network. Where there are adverse impacts, it also includes an assessment of the potential mitigation for those impacts.
Assemblage	A group of species found in the same location.
Avoidance	Prevention of impacts occurring, having regard to predictions about potentially negative environmental effects (for example, project decisions about site location or design).
Baseline conditions	The conditions that would pertain in the absence of the proposed project at the time that the project would be constructed / operated / decommissioned. The definition of these baseline conditions should be informed by changes arising from other causes (for example, other consented developments).

Term	Definition
Biodiversity	The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.
Biophysical change	Alteration in biological and / or physical conditions of the environment (for example, changes in the atmospheric concentration of carbon dioxide, altered soil pH or change in the frequency of a plant compensation species in an area).
Compensation	Measures taken to offset the loss of, or permanent damage to, ecological features despite mitigation. Any replacement area should be similar in terms of biological features and ecological functions that have been lost or damaged, or with appropriate management have the ability to reproduce the ecological functions and conditions of those biological features. Compensation addresses negative effects which are residual, after avoidance and mitigation have been considered. It is this objective of compensation, and not its location, that distinguishes compensation from 'mitigation'. Depending on circumstances, compensation measures may be located within or outside the project site.
Connectivity	A measure of the functional availability of the habitats needed for a particular species to move through a given area. Examples include the flight lines used by bats to travel between roosts and foraging areas or the corridors of appropriate habitat needed by some slow colonising species if they are to spread.
Conservation objective	Objective for the conservation of biodiversity (for example, specific objective within a management plan or broad objectives of policy).
Conservation status	The state of a species or habitat including for example, extent, abundance, distribution and their trends.
Cumulative impact / effect	Additional changes caused by a proposed development in conjunction with other developments or the combined effect of a set of developments taken together.
Distribution	The geographical presence of a feature. This can depend on factors such as climate and altitude.
Ecological feature	Habitats, species or ecosystems.
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
Effect	Outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow.
Enhancement	Improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which is unrelated to a negative impact or is 'over and above' that required to mitigate / compensate for an impact.
Fragmentation	The breaking up of a habitat, ecosystem or land-use type into smaller parcels with a consequent impairment of ecological function.

Term	Definition
Geographic scale	The geographic context for evaluation.
Habitat	The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.
Habitats Regulations Appraisal	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a project against conservation objectives of the site and to ascertain whether it would adversely affect the integrity of the site.
Impact	Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow.
Important ecological features	Ecological features requiring specific assessment within EcIA. Ecological features can be important for a variety of reasons (for example, quality and extent of designated sites or habitats, habitat / species rarity).
Population	A collection of individuals (plants or animals), all of the same species and in a defined geographical area.
Rarity	A measure of relative abundance.
Replacement	The creation of a habitat that is an acceptable substitute for the habitat which has been lost
Restoration	The re-establishment of a damaged or degraded system or habitat to a close approximation of its pre-degraded condition.
Screening report	Report containing information to determine whether an Appropriate Assessment is required.
Zone of Influence	The area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities.

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