5 ECOLOGY AND NATURE CONSERVATION (PART 1 – ECOLOGY)

Introduction

5.1.1 This chapter considers the likely significant effects on ecological receptors associated with the construction, operation and decommissioning of the proposed XLCC Cable Factory – Hunterston (hereafter referred to as the 'Project'). The effects associated with the construction phase of the Project on ecological receptors can be considered to be representative of reasonable worst-case decommissioning effects, therefore a separate assessment of the decommissioning phase has not been undertaken as part of this assessment.

5.1.2 The specific objectives of this chapter are to:

- describe the ecological baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect and cumulative effects; and
- describe the mitigation measures proposed to address likely significant effects.

5.1.3 Details of the proposed Project are set out in Chapter 2: Project Description of this Environmental Impact Assessment (EIA) Report. This chapter concentrates on the potential impacts of the Project within and adjacent to the Project site boundary, and, where appropriate, considers the potential effects over a wider zone of influence. Cumulative effects of the Project, when combined with other developments in the local area, have also been considered.

5.1.4 This chapter should be read in conjunction with Appendix 5.1 Ecology and Nature Conservation Technical Report where full details of the surveys, methodologies, data collected and results are reported.

5.1.5 All staff who have contributed to fieldwork of this chapter have relevant experience, an undergraduate or higher postgraduate degree in relevant subjects, or hold professional membership of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Assessment Methodology

Planning Policy Context

5.1.6 Table 5.1 below summarises the planning policies relevant to this assessment.

Table 5.1: Summary of National and Local Planning Policies

Document	Brief description
National Planning Policy	
The National Planning Framework (NPF) 3 (Scottish Government, 2014a)	The National Planning Framework (NPF) for Scotland has been prepared by the Scottish Government (Scottish Government, 2014a). It is the spatial expression of the Government's economic strategy and plans for infrastructure investment. It also provides a framework for the spatial development of Scotland as a whole. The current NPF is NPF3 and sets out the Scottish Government's strategic development priorities over the next 20-30 years. The draft Fourth National Planning Framework (NPF4) (Scottish Government, 2021c) detailing the long-term plan for Scotland by 2045 was laid in Parliament on 10th November 2021 and is now out for

Document	Brief description
	consultation until March 2022. The NPF4 should therefore be given weight in the determination of future proposals.
Scottish Planning Policy (SPP) (Scottish Government, 2014b)	Sets out national planning policy considerations in relation to Scotland's natural heritage; summarises the main statutory obligations on the conservation of natural heritage; explains, as part of a wider framework for conservation and development, how natural heritage objectives should be reflected in development plans; describes the role of the planning system in safeguarding sites of national and international importance; provides guidance on the approach to be adopted in relation to local and non-statutory designations; and draws attention to the importance of safeguarding and enhancing natural heritage beyond the confines of designated areas.
Local Planning Policy	
The North Ayrshire Local Development Plan 2 (North Ayrshire, 2019)	The North Ayrshire Local Development Plan 2 sets out to guide development and investment in the area over the 20 years to 2039. The Local Development Plan will set out the land use strategy that supports the delivery of The Local Outcomes Improvement Plan 2017-22 (LOIP). Proposals and policies contained in the plan align with the ambitions and outcomes that Community Planning Partners aim to achieve.
Additional Guidance	
The Hunterston Port and Resource Centre (Hunterston PARC) Development Framework (2021)	The development framework seeks to maximise the opportunities provided by this site by proposing what is seen as the optimal layout or mix of uses. One of the key elements of the Hunterston PARC framework is a research and development campus which will offer an incubator space for new research primarily in the blue/green economy. Green economy strategies tend to focus on the sectors of energy, transport, and sometimes agriculture and forestry, while the blue economy focuses on fisheries, and marine and coastal resources. Both incorporate strategies to address climate mitigation and adaptation. This campus will sit within the blue/green principle underpinned by the three pillars of the site of Industry, the Marine Yard and the Port.

Relevant Legislation and Guidance

5.1.7 Table 5.2 below sets out the key legislation and guidance relevant to this assessment.

Table 5.2: Summary of Relevant Legislation and Guidance

Document	Brief description
Legislation	
Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	The main aim of the European Commission (EC) Habitats and Species Directive 92/43/EEC (the EC Habitats Directive) is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed in the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. Member States are required to take requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) and plant species in Annex IV (b). The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) translated this European legislation into UK law. This was updated to the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 following the UK's exit from the European Union. European Protected Species are defined under the EC Habitats Directive and include species such as otter, and all species of bat.

Document	Brief description
	This legislation makes it an offence to deliberately or recklessly disturb European Protected Species (EPS). Their places of shelter are fully protected, and it is an offence to damage, destroy or obstruct access to or otherwise deny the animal use of a breeding site or resting site, whether deliberately or not. It is also an offence to disturb in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species, disturb in a manner, or circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young. Any activity which is likely to affect these species requires prior consultation with the relevant statutory nature conservation organisation (i.e. NatureScot) and may require a licence to be issued before they can be carried out.
The Wildlife and Countryside Act (1981, as amended).	The Wildlife and Countryside Act 1981 provides protection to a range of habitats and species. The Nature Conservation (Scotland) Act 2004 and Wildlife and Natural Environment (Scotland) Act 2011 amend the Wildlife and Countryside Act in Scotland.
Nature Conservation (Scotland) Act 2004 (as amended)	The act places duties on public bodies to conserve biodiversity, increase the protection for Sites of Special Scientific Interest (SSSIs), and strengthens the legal protection for threatened species.
The Wildlife and Natural Environment (Scotland) Act 2011	Provides changes to the Wildlife and Countryside Act 1981 modernising game law and deer management legislation, badger licensing legislation, strengthens controls on invasive non-native species, improves SSSI legislation and modifies Muirburn (the burning of heathland to promote regrowth) regulations to limit the season and introduce licensing.
The Protection of Badgers Act 1992	Offences under the Act include: (1) taking, injuring or killing badgers; (2) cruelty to badgers; (3) interference with badger setts; (4) selling and possession of live badgers and (5) marking and ringing. Exceptions and licences can apply.
The UK Biodiversity Action Plan (UKBAP) 1994	Produced in response to the Convention on Biological Diversity through the development and enforcement of national strategies and associated action plans for biological diversity.
Guidance	
Guidelines for Ecological Impact Assessment in the United Kingdom (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)	This document updates the previous iterations of the guidance detailing the methods for implementing Ecological Impact Assessment and a focus on the hierarchy of avoidance, mitigation and compensation. The table-based approach of assessment has been removed from the original (2006) version of the guidance used in the previous assessment with the emphasis switched to professional judgement.
Bat Conservation Trust's Bat Surveys for Professional Ecologists. Good Practice Guidelines (Collins, 2016).	This document provides the third edition of the standard guidance for professional ecologists assessing the presence of bats for development.
NatureScot Species Planning Advice (NatureScot, 2021)	This is standing advice to help planning applicants seeking permission for development that could affect protected species including otter, badger, great crested newts, reptiles, water vole and to assist planning officers and other regulators in their assessment of these applications.
Scottish Environmental Protection Agency (SEPA) – Land Use Planning System SEPA Guidance Note 31 (SEPA, 2017)	Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.

Study Area

5.1.8 The study area for the purposes of the assessment comprises a series of zones around the Project site dependent on the potential receptors. These include:

- records of notable and protected species within 2km (Figure 5.2);
- statutory and non-statutory sites within 10km;
- badger (*Meles meles*) within 100m (Figure 5.1); and
- otter (*Lutra lutra*) within 200m (Figure 5.1).

Baseline Methodology

Desk Study

5.1.9 A request was made to the South West Scotland Environmental Information Centre (SWSEIC) for all records of Notable and Protected Species within 2km of the site within the last 10 years. A search area of 2km was requested as it is considered unlikely the Project would affect specific interests of such species beyond this distance.

5.1.10 A search was made for all sites with a European, national or local authority designation with an ecological interest (excluding ornithology which is dealt with in Chapter 5: Ecology and Nature Conservation (Part 2 – Ornithology), including Special Areas of Conservation (SACs), SSSIs, National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) that could be affected by the Project.

5.1.11 The following resources were also used to complete the search:

- NatureScot Sitelink database website;
- Saving Scotland's Red Squirrels website; and
- Scotland's Environment Web.

5.1.12 Historic data from the 2009 EIA submission in support of the provision of a multi-fuel power station and associated onsite carbon capture and storage infrastructure development, and a Phase 1 Habitat Survey map, produced in April 2018, was supplied to RPS by the Applicant. The northern section of the assessment area overlaps the current Project application boundary and so a review of the relevant data was undertaken as part of the desk study.

Field Study

5.1.13 Aerial imagery was studied in the process of this desk-based assessment to ascertain the likely habitats within and surrounding the Project site, and the species these may be likely to support. Following a review of consultation responses (see Table 5.3 below), a Baseline Ecological Constraints Survey was carried out to complete the baseline assessment of ecological features present within the Project site and surrounding area.

5.1.14 The survey was undertaken on 03 June 2021. The scope of the survey was to establish a baseline of ecological constraints relating to protected or notable species and to ascertain whether the proposed Project and associated activities have the potential to affect protected or notable species.

5.1.15 Species surveyed for, and the guidance for the survey methods employed, were as follows:

- otters (200m buffer) – (Bang & Dahlstrøm, 2001);

- badgers (100m buffer) – Scottish Natural Heritage (SNH[1], 2008 and Bang & Dahlstrøm, 2001).

5.1.16 The surveys to assess the utilisation of the Project site and surrounding area by these mammals was undertaken on 02 December 2021. Otter surveys can be conducted all year round, providing there has been limited previous days of rain and water levels have been low (NatureScot, 2021). These conditions were met for conducting the otter survey. The badger survey was conducted outwith the optimal survey period, which is February to April (NatureScot, 2018).

5.1.17 The surveys assessed all suitable habitats for these species within the study areas identified in paragraph 5.1.8. Further details of the survey methods are given in Appendix 5.1 Ecology and Nature Conservation Technical Report.

Consultation

5.1.18 To ensure comprehensive coverage of ecological interests, key Statutory Nature Conservation Bodies (SNCBs), Environmental Protection Agencies (EPAs), and non-governmental organisations (NGOs) relevant to ecology were consulted during the Project's Scoping process and their responses have been considered during the preparation of this chapter. A summary of the relevant consultation responses is presented in Table 5.3.

Table 5.3: Consultation Responses Relevant to this Chapter

Date	Consultee and Issues Raised	How/ Where Addressed
Date	Consultee and Issues Raised	How/ Where Addressed
13 December 2021	**NatureScot** **General Scoping Advice** The Ecology Chapter of the EIA Report should assess the potential effects of the proposed development on important ecological features and should detail proposed mitigation and/or compensation measures required to avoid, minimise, restore or offset adverse effects and demonstrate positive effects for biodiversity. **Nationally Protected Sites** An assessment of the potential impacts on the Southannan Sands SSSI and its notified interests should also consider project specific and cumulative impacts on the recently discovered mussel reef, supporting a native oyster bed, as well as the other Priority Marine Features identified in Annex A. Priority Marine Features (PMF) do not have legislative protection, but the basis for protection of their national status across Scottish waters is included in the National Marine Plan. As such North Ayrshire Council, as regulatory authority, must be provided with sufficient detail to	Section 5.1.63 to 5.1.122 Sections 5.1.56 to 5.1.58 and sections 5.1.95 to 5.1.99.

[1] Since 2019, SNH have been known as NatureScot

Date	Consultee and Issues Raised	How/ Where Addressed
	consider the effect of the proposal on PMFs before it can be consented. **Cetaceans & Priority Marine Features** We advise that the following European Protected Species (EPS) and PMF species are all found within the Firth of Clyde: harbour porpoise, bottlenose dolphin, common dolphin, minke whale, harbour seal, grey seal and basking shark. Due to the potential for disturbance and auditory injury impacts via noise during construction and noise and direct disturbance during operation, the impact of the development needs to be evaluated. The cetacean risk assessment should be submitted as part of an EIA or environmental report to support a planning application.	Sections 5.1.56 to 5.1.58 and sections 5.1.95 to 5.1.99.
	Invasive non-native species During operation of the facility we understand that the majority of the factory production output will be carried by ship (Scoping Report section 6.10.3). This increased marine activity will need to be assed for its potential to increase the spread of INNS into the surrounding area, including the adjacent SSSIs and also to disturb or directly harm Cetaceans and PMF. These risks should be assessed in the EIA and mitigated where required.	Section 5.1.110
	Mitigation and best practice in environmental management Securing net positive effects for biodiversity from development is a key theme of the emerging NPF4 and of The Planning (Scotland) Act 2019. The environmental assessment process is a key mechanism to help embed and demonstrate this approach and guide delivery. We welcome opportunities to discuss options to demonstrably improve overall biodiversity in and around this important site for commerce and the environment.	Section 5.1.63

Assessment Criteria and Assignment of Significance

5.1.19 The method of assessment for this chapter follows that of the CIEEM (2018) guidance. The term Important Ecological Features (IEFs) is used for those species and habitats identified in the assessment. For each impact with the potential to affect the relevant IEFs, the assessment considers the following parameters:

- the value and importance of the IEF taking into account its national and regional conservation status;

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

5.1.20 The assessment similarly includes consideration of any proposed mitigation to avoid or minimise the effect of any potential impacts on the relevant IEFs. The CIEEM guidelines also require the identification of potential cumulative impacts from other developments, be this negligible, minor, moderate or major. Effects can be either adverse or beneficial.

Receptor Sensitivity/Value

5.1.21 The approach to the assessment of the sensitivity and value of IEFs is to consider the conservation status and importance of the feature present on the Project site or surrounding zones of influence.

5.1.22 The national conservation status of IEFs in the UK can be divided into five categories[2];

1. Species and habitats given special protection under Conservation of Habitats and Species (Amendment) (EU Exit) regulations 2019;
2. Species and habitats given special protection under UK legislation;
3. Species and habitats of serious conservation concern; Scottish Biodiversity List (SBL) Priority species;
4. Species and habitats of some conservation concern listed on a Local Biodiversity Action Plan (LBAP); and
5. Species and habitats for which there is little or no conservation concern; species common and widespread throughout the UK.

5.1.23 The regional conservation status of IEFs can be divided into three categories:

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

5.1.24 The resultant conservation value of IEFs on the Project site or within zones of influence is based on the interaction between their National conservation status and Regional conservation status in central Scotland. Table 5.4 sets out the resultant nature conservation values of species and habitats. Note that the categories shown may be modified according to the national or regional circumstances of a particular species. In Table 5.4, "National" refers to the whole of the UK; "Regional" refers to central Scotland and "Local" refers to the Project site and immediate environs.

Table 5.4: Conservation Value of IEFs

National Conservation Status	Regional Conservation Status		
	Rare	Uncommon	Common
EU Legislative Protection	International	National	Regional

[2] Species or habitats in a sixth category, International Union for Conservation of Nature (IUCN) globally - threatened species, are unlikely to occur on any proposed UK development site, but if they did would be considered to be of International status irrespective of their regional status.

National Conservation Status	Regional Conservation Status		
UK Legislative Protection	National	National	Regional
SBL Listed	National	National/Regional	Regional/Local
LBAP Listed	Regional	Regional	Local
Common/widespread	Regional	Local	Local

Magnitude of Impact

5.1.25 The criteria used for assessing the magnitude of impacts on IEFs are:

- High: Impact that would cause major loss of habitat/population on the Project site and have a sufficient effect to alter the nature of the habitat/population in the short to long-term affecting long-term viability. For example, more than 20% habitat loss or long-term damage, or more than 20% loss of a species' population.
- Medium: Impact that is detectable in the short to medium term, but which should not alter the long-term viability of the feature/population. For example, between 10-20% habitat loss or 10-20% reduction of a species population.
- Low: Impact of small scale or short duration that results in no long-term harm to the habitat/populations viability. For example, a loss or damage of under 10% of the habitat.
- Negligible: No loss or alteration of characteristics, features or elements; no observable impact in either direction.

5.1.26 The duration of impacts is hard to quantify across all IEFs due to inherent differences in life histories. Therefore, the duration of each impact on IEFs is assessed on an individual basis considering species' and habitats' ecological characteristics.

Significance of Effects

5.1.27 The significance of each effect upon each IEF is assessed. An ecologically significant effect is defined as an impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species (CIEEM, 2018). The effect is assessed within a specific geographic context i.e. at the scale at which the ecological feature was valued (e.g. local/ national/ international). Effects are considered to be significant under the EIA Regulations where the effect is classified as being 'major' or 'moderate', while effects assessed as 'minor' are not significant. Table 5.5 shows the Assessment Matrix used to guide the assessment of significance.

Table 5.5: Assessment Matrix

Conservation Value	Magnitude of Impact			
	Negligible	Low	Medium	High
Local	Negligible	Negligible or minor	Negligible or minor	Minor
Regional	Negligible or minor	Negligible or minor	Minor	Minor or moderate
National	Negligible or minor	Minor	Moderate	Moderate or major
International	Minor	Minor or moderate	Moderate or major	Major

5.1.28 Using the above matrix, further consideration is then given to the impacts as follows:

- Major: effects are likely to be important considerations at an international or national scale and if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision-making process.

- Moderate: effects, if adverse, while important at a regional or local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
- Minor: effects may be raised as local issues, but which are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

5.1.29 The final assessment of whether a significant effect is likely is completed by taking the mitigation measures that are adopted as part of the Project into account, including both the mitigation incorporated into the design of the Project and mitigation required to address residual impacts. This requires an assessment of the likelihood of successful mitigation being achieved and the mitigation proposed needs to be qualified in terms of the probability of success. The assessment of the likely success of any mitigation and hence the significance of any effects is based on both professional judgement and experience of other mitigation schemes. In general, a precautionary approach is advisable in determining the outcome. However a realistic rather than worst-case scenario assessment is used. In determining likely significant effects on protected sites a precautionary approach is always adopted.

Limitations of the Assessment

5.1.30 The majority of ecological data remain valid for only short periods due to the potential for changes in habitats and species populations due to ecological change. The survey results referred to in this chapter are considered accurate for 24 months, assuming there are no significant changes to site conditions.

5.1.31 The Phase 1 Habitat Survey used to undertake this assessment was completed in 2018 and covered the site layout for a previous design covering a larger site boundary than that considered for this assessment. While it is possible that the coverage of the habitats would have altered over time, during the 2021 surveys the surveyors compared the survey results with the current site conditions and concluded that the habitats present and their extent over the site were essentially the same as described in 2018. Given the low ecological value of the majority of the habitats on the site, the age of the data is therefore not considered to constrain the assessment.

5.1.32 It is possible that the presence of newly established Invasive Non-Native Plant Species (INNPS) may not be documented. It is recommended that further surveys for INNPS are completed prior to construction to ensure that relevant guidance and legislation is adhered to in order to minimise the potential for the spread of invasive species. This measure is therefore included in 5.1.98, Further Mitigation.

5.1.33 The baseline ecological constraints survey was conducted in June 2021. Whilst this is within the recommended botany survey season of April to September, the presence of leaf growth on trees can render assessment for bat roosting potential difficult. Furthermore, vegetative growth can render signs of badger, water vole, and otter hidden and challenging to find. Given the dominance of bare ground habitat within the Project site, it is considered that this is not a significant limitation to the survey for the baseline ecological constraints assessment.

5.1.34 During the protected species survey conducted in December 2021 it was noted that otter prints were unable to be tracked within coastal rock armour due to lack of visibility within the rocks. Therefore, this area was unable to be fully assessed for potential resting sites. Furthermore, due to the tidal nature of the western section of the survey area, it is possible that otter field signs may have been washed away. This is not thought to affect the robustness of the protected species survey results as the survey effort was considered sufficient to inform the assessment in respect to major constraints regarding this species. In addition, the pre-construction mitigation measures recommended within this document suggest pre-construction surveys within three months of the

Project works commencing in order to update baseline conditions. This will enable any refinements to be made through adjustments to the construction programme to take into account any up-dated distributions or presence of species such as otter.

5.1.35 At the time of report production, the results of the data request from South West Scotland Environmental Information Centre, had not yet been received, and so cannot be commented on.

Baseline Environment

Desk Study

5.1.36 Three statutory and five non-statutory designated sites are located within 2 km of the Project site. Table 5.6 and provide further details.

Table 5.6: Statutory and Non-Statutory Designated Sites

Site	Designation	Distance from Project site
Statutory Sites		
Southannan Sands	SSSI. Designated for the intertidal marine habitats and saline lagoons: Sandflats	0.1 km
Hunterston No. 1	Tree Preservation Order (TPO)	Just out with the project site boundary.
Ballochmartin Bay	SSSI. Designated for the intertidal marine habitats and saline lagoons: Sandflats	1.5 km
Non-Statutory Sites		
Allan Wood	Ancient Woodland Inventory - Semi Natural	1.2 km
The Glen	Ancient Woodland Inventory - Semi Natural	0.3 km
Kilruskin Wood	Ancient Woodland Inventory. Long-established Woodland of Plantation Origin. Covered by TPO	1.2 km
Hunterston House	Ancient Woodland Inventory. Long-established Woodland of Plantation Origin. Covered by TPO	0.25 km
Diamond Hill Southannan	Ancient Woodland Inventory. Long-established Woodland of Plantation Origin.	0.3 km

5.1.37 A Tree Preservation order (Hunterston No. 1) was noted to the east and the south of the site covering Kilruskin Wood and Hunterston House Ancient Woodland Inventory (AWI) sites.

5.1.38 Southannan Sands SSSI lies immediately to the west. Designated for its intertidal sand flats, the site has particular interest as a host for nationally scarce dwarf eelgrass *Zostera noltei*.

5.1.39 Data was requested data from the South West Scotland Environmental Information Centre (SWSEIC) however at the time of writing has not been received.

5.1.40 The desk study data taken from the SSRS website confirmed the presence of red squirrel in the area with the most recent sighting dating from 2021.

5.1.41 Protected species surveys undertaken in 2008 and 2009 to inform the 2009 Clydeport Bulk Terminal and Construction Yard EIA report were undertaken in the surrounding area. Although these results are not specific to the Project Site, they provide an indication of the receptors that may need to be considered in this assessment. Results of these surveys are outlined below in Table 5.7.

Table 5.7:Results of the 2018 and 2019 Clydeport Bulk Terminal and Construction Yard EIA Report

Species	Results
Otter	Habitat with foraging and sheltering potential was found along Burn Gill. The dense network of tree roots was suitable for holt excavation, and dense vegetation provided sheltering opportunities.

Species	Results
	No evidence of otter was observed along the coastline, and it was noted that it is very difficult to locate otters in rip-rap.
Bats	Minimal bat roost potential was identified within the Project site boundary. However, the broad-leaved woodland and areas of scrub provided foraging opportunity for bats. Activity surveys were conducted and there was no evidence that there were bat roosts within the woodland. Common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) were recorded foraging along the eastern boundary of the study area.
Amphibians and reptiles	No evidence was found to suggest a population of great crested newt was present. The reptile survey also found no evidence of the presence of any reptile species, even though suitable sheltering and basking habitat was observed.
Invertebrates	A low diversity of invertebrate groups was found. The numbers of individual spiders and number of species of spider recorded was very low. In addition, bees and wasps were low in number and all common, apart from the cuckoo bee (*Sphecoides pellucidus*) which is rare in Scotland. This was the third recorded site in Scotland and the first in Ayrshire at the time of reporting. Eight species of day flying moth were recorded, one of which was the grayling (*Hipparchia semele*) which is a UK BAP species.
Fish Habitat	Burn Gill was surveyed and the presence of brown/sea trout (*Salmo trutta*), brown trout (*Salmo trutta ssp. fario*) and flounder (*Platichthys flesus*) were noted.

Field Surveys

Habitats

5.1.42 Table 5.8 lists the broad Phase 1 Habitat types within the survey area which were mapped in 2018 (Figure 5.3). The dominant habitat type on the Project site was bare ground. During the surveys carried out in 2021 no significant change to these habitats was noted and they have been assessed as having low conservation value.

Table 5.8: Phase 1 Habitat Types

Phase 1 Habitat Type	Survey Area (ha)	Project Site (ha)
Bare ground (J4)	58.0	39.7
Cultivated/disturbed land - ephemeral/short perennial (J1.3)	8.4	1.7
Scrub - dense/continuous (A2.1)	7.3	2.0
Broadleaved woodland - semi-natural (A1.1.1)	6.2	-
Neutral grassland - semi-improved (B2.2)	4.6	3.0
Hardstanding	3.8	3.8
Buildings (J3.6)	0.8	0.1
Other tall herb and fern – ruderal (C3.1)	0.4	0.3
Marsh/marshy grassland (B5)	0.4	-
Total	**89.9**	**50.6**

5.1.43 None of the habitats identified are listed on Annexe 1 of the Local Biodiversity Action Plan (LBAP).

5.1.44 Three non-native invasive plant species (INNPS) were recorded within the Project Site (Figure 5.4). These include rhododendron (*Rhododendron ponticum*), Japanese knotweed (*Reynoutria japonica*) and giant hogweed (*Heracleum mantegazzianum*).

Protected Species

Bat Species

5.1.45 The woodland to the east of the site provides foraging and commuting opportunites for bats; however, the Project site itself is dominated by bare ground with little vegetative cover. Although some water bodies were recorded within the survey area which could provide foraging potential for bats, the cluster of ponds located in the northwest of the site were classed as having poor water quality during the great crested newt habitat assessment. As such, the site is considered to have low foraging potential and to have no roosting opportunities for bats.

Otters

5.1.46 The habitat to the west of the Project site offered good potential for foraging otter; resting sites such as couches; and holt building potential. Signs of otter were recorded within the Project area. A series of prints were observed within the sand to the west leading into the rock armour along the shoreline, leading to potential resting areas. Due to the nature of the rock armour, assessment of this was unable to be made at the time of survey.

Water Voles

5.1.47 The site did not contain any flowing water courses at the time of survey though dry ditches were observed. The closest presumed permanent watercourse is an unnamed burn approximately 60m east of the site. No evidence of water vole was observed around any of the dry drainage ditches. The habitats here would provide limited opportunities for water vole owing to the nature of the banks (comprising a mix of compacted crushed stone sub-base and coal). The site is understood to be outside of the currently known range of fossorial water voles in the Glasgow area. Therefore, water voles are not considered likely to utilise the site, nor to be affected by the Project. Consequently, water vole can be scoped out of further assessment.

Badger

5.1.48 Some of the habitats on the Project site and the survey area offer good potential for foraging badger and sett creation. Within the wider landscape the land to the east contains a mosaic of farmland and woodland which offers moderate foraging and sett building potential for badgers, so it is possible that badgers are present in the local area. The desk study identified the presence of badgers in the area.

5.1.49 During a targeted survey for badger, no setts or field signs of were observed within the Project site. The ground to the east of the Project site was unsuitable for sett building, however the mixed woodland on the eastern embankment provided potential foraging and sett building habitat. During the Ecological Constraints Assessment walkover, a single badger footprint was observed to the south of the Project site.

Reptiles

5.1.50 The site itself provides little vegetative cover and so does not provide suitable opportunities for reptiles. However, the surrounding habitats to the east and west provide opportunities for reptiles. This is through a combination of being open to the south, and thus will catch the sun, and having a varied vegetation cover including scrub and grassland habitats. In addition, these areas have potential for resting, sheltering, and hibernation due to piles of rocks and logs associated with the former industrial use of the site.

Great Crested Newt

5.1.51 Three ponds were surveyed, upon which a Habitat Suitability Index (HSI) assessment was conducted. Full details of the ponds and the HSI results can be found in Appendix 5.1: Ecology and Nature Conservation Technical Report. Of the three ponds surveyed, all were deemed to be of poor suitability for great crested newts. Therefore, great crested newt can be scoped out of further assessment.

Red Squirrel

5.1.52 Mixed woodland to the east of the site may provide suitable foraging and commuting habitat for red squirrel. A potential red squirrel (*Sciurus vulgaris*) drey was observed within a Scots pine (*Pinus sylvestris*) next to the A78, to the east of the site (Figure 5.4). It should be noted, however, that it is not possible to distinguish red squirrel dreys from those of grey squirrels (*Sciurus carolinensis*). As no squirrels were observed using the drey during the survey, it was not possible to confirm if the drey was active and confirm which species was using it.

5.1.53 The desk study data taken from the SSRS confirms the presence of red squirrel in the area with the most recent sighting dating from 2021.

Terrestrial Invertebrates

5.1.54 Open mosaic habitats on previously developed land (OMHPDL) are typically considered to provide a complex habitat structure with a wide range of micro-habitats which provide opportunities for niche invertebrates and can host the same invertebrate diversity as semi-natural habitats (Cathrine, 2020). While habitats were identified in the southern survey boundary which may fall into this category, the habitats within the Project site were considered to offer negligible potential for terrestrial invertebrates due to the dominance of bare ground and as such terrestrial invertebrates can be scoped out of further assessment.

Fish and Fish Habitats

5.1.55 The site did not contain any flowing water courses at the time of survey though dry ditches were observed. The closest presumed permanent watercourse is an unnamed burn approximately 60m east of the site. Fish and their habitats are not considered to be affected by the proposals and can be scoped out of further assessment.

Marine Habitats and Associated Species

5.1.56 The Project site is adjacent to Southannan Sands SSSI, designated for intertidal marine habitats and saline lagoons: sandflats.

5.1.57 Within the Firth of Clyde, the following European Protected Species (EPS) and Priority Marine Feature (PMF) have been recorded and are known to regularly occur in the area: harbour porpoise *Phocoena phocoena*, bottlenose dolphin *Tursiops truncatus*, common dolphin *Delphinus delphis*, minke whale *Balaenoptera acutorostrata*, harbour seal *Phoca vitulina*, grey seal *Halichoerus grypus* and basking shark *Cetorhinus maximus*.

5.1.58 As there are no marine works proposed as part of the Project, there is no impact pathway whereby these, or any other marine species, could be impacted by the proposed works. Therefore, an assessment of possible impacts to marine species was scoped out of this EIA Report.

Future Baseline Conditions

5.1.59 Hunterston PARC, in which the Project site sits, is subject to an overarching development framework, which was submitted in October 2021 (Peel Ports, 2021). This framework includes education facilities, research and development offices and incubator hubs for new start-ups as a

way of providing a healthy and sustainable commercial development. In the proposed development framework, the Project site is designated for port use and industry.

5.1.60 The UKCP18 climate change projections (Met Office, 2018) indicate that in general, warmer, wetter winters and hotter, drier summers are predicted, though natural variations in weather patterns will continue from year to year. No clear trend in wind speeds or storms is predicted, though the data currently published cannot make projections for local conditions and wind gusts.

5.1.61 Whilst there are potential effects of climate change on the future ecological baseline, it must be recognised that ecosystems are complex and are affected by a wide range of factors, and that there are limited data and modelling capability. Given the essentially artificial habitats within the site, it is likely that anthropogenic effects on biodiversity through the management and use of the land will be of much more significance than any effects of climate change.

5.1.62 In the absence of management, some further development of open mosaic habitats of previous developed land would probably occur on the site. However, given the nature of the substrates present such progression would be slow.

5.1.63

Mitigation Measures Adopted as Part of the Project

Embedded Mitigation

5.1.64 External lighting would be designed to allow for night-time safety and security when required, incorporating the development's operational requirements. The exterior lighting scheme design provided at Appendix 2.3 would minimise lighting spillage into surrounding areas and discourage trespass in compliance with the Dark Skies Campaign and recommendations in the Society of Light and Lighting (SLL) Lighting Handbook (Chartered Institution of Building Services Engineers (CIBSE), 2018). Lighting would be designed to be activated only when required. This would also reduce the risk of bats being disturbed while foraging and commuting along the woodland edges adjacent to the site.

Pre-Construction Mitigation

5.1.65 Prior to commencement of works on site, pre-construction surveys for protected species will be carried out to check for changes in baseline conditions. This will enable any refinements to be made (if necessary) through adjustments to the construction programme to take into account any up-dated distributions or presence of species.

5.1.66 Surveys will be undertaken within three months prior to commencement of the works in order to obtain as accurate a representation of the baseline conditions as possible. Should this period of time elapse between pre-construction surveys and the commencement of works then the need to repeat surveys will be assessed by an appropriately qualified ecologist.

5.1.67 Once the updated surveys are completed, species specific protection plans would be included in the Code of Construction Practice (CoCP) setting out any constraints, mitigation and/or compensation requirements and emergency procedures in the unlikely event that a protected species is encountered. These surveys will also inform the requirement for any licencing for disturbance, damage or destruction of a resting site of a protected species.

5.1.68 Further surveys for INNPS would be completed prior to construction to ensure that relevant guidance and legislation is adhered to, and to minimise the spread of invasive species.

Construction Mitigation

5.1.69 All relevant mitigation measures will be implemented through the Project CoCP, which will be prepared in consultation with, and to the satisfaction of, North Ayrshire Council, SEPA and NatureScot. These will include measures such as:

- application of SEPA Pollution Prevention Guidance (PPGs) and the delimitation of working areas to minimise damage to habitats;
- a minimum 50 metre buffer will be maintained, where possible, between working areas, machinery and watercourses and ditches;
- pollution prevention measures will be installed and maintained as appropriate, including sediment and dust mitigation measures;
- chemicals, oils and hazardous materials will be securely stored with appropiate contaiment in designated areas a minimum distance of 50 metres from any watercourses;
- spillage contingency kits will be provided in all site vehicles and there will be daily checks for oil and fuel leaks;
- application of best practice in relation to the removal and storage of vegetation turfs, soils and peat to ensure effective reinstatement of vegetation wherever possible;
- application of best practice techniques of construction to ensure that drainage patterns and water quality within the study area are maintained; and
- timing of earth works to avoid periods of heavy rain when the risk of fine sediment being transported is significantly increased.

5.1.70 Pollution incident response and drainage management measures will be prepared as a part of the CoCP to minimise potential pollution effects.

5.1.71 An Ecological Clerk of Works (ECoW) will be employed to oversee key elements of enabling works and construction. This will be a suitably experienced individual, whose role will ensure works are carried out in accordance with the CoCP to ensure compliance with international and national legislation and planning conditions. The ECoW will also review results of protected species surveys prior to commencement of works in different areas within the Project site. Once works are underway, the ECoW will provide ecological and pollution control advice and supervision for all relevant mitigation measures and monitoring. The ECoW will complete checks for all protected species during the construction phase of the development.

5.1.72 Best practice measures for minimising the potential for disturbance and injury to protected species will be employed and detailed in the CoCP. These will include:

- directional lighting when required;
- covering all trenches, trial pits, excavations and pipelines to prevent animals entering these holes;
- provision of a method of escape (e.g. a plank) where such excavations cannot be closed or filled on a nightly basis; and
- vehicle speeds will be restricted across site in order to minimise the risk of collision with animals, specifically badger and otter.

5.1.73 Prior to any de-vegetation works the area should be checked by an ecologist to ensure no harm comes to reptiles as a result of the construction activities, this includes:

- Any potential refugia and/or hibernacula features identified for reptiles in the works area should be dismantled under the supervision of a suitably experienced ecologist, relocated and recreated in an appropriate area in the vicinity of suitable habitat following the guidance provided in Edgar *et al*. (2010). Removal of the most suitable terrestrial habitats for reptiles to

be affected by construction activities will be planned to take place outside of the hibernation periods for these species. The probable low density of reptiles within the construction areas does not merit specific searches in advance of construction. Removal of these habitats will be supervised by the ECoW who will halt works where necessary to allow reptiles to be translocated away from the construction area during the works.

- Appropriate speed limits adopted on site by all vehicles to reduce any collision with reptiles and allow displacement.

Operational Mitigation

5.1.74 It is anticipated that the habitats around the perimeter of the site will form part of the enhancement for the overarching Hunterston PARC ecology and landscaping strategy so will not be directly affected by the development. Where possible the existing habitats would be retained and enhanced in specific ecological mitigation areas using native species. Where ground works impact the existing habitats within the ecological mitigation areas, seeding and planting of native species would be undertaken.

5.1.75 Vehicles coming on site will be regularly checked for oil leaks to avoid the risk of pollution. Spillage kits will be available. Best practice methodologies will be employed during any maintenance works to ensure the prevention of any pollution to habitats or watercourses, along with implementation of the site pollution incident response plan and drainage management plan.

5.1.76 Vehicles will maintain a regulated speed to reduce any potential collision with protected species such as badger and otter.

Identification of Important Ecological Features

5.1.77 The majority of the ecological receptors for the Project are only likely be impacted at the local or regional level. This is because the impacts on the potential receptors are only within the main Project site itself.

5.1.78 Potential ecological receptors identified during the previous reports and 2021 field surveys include habitats, bats, otters, water voles, badger, reptiles, great crested newts, red squirrels, terrestrial invertebrates, fish, and marine mammals. Statutory and non-statutory designated sites include Southannan Sands SSSI adjacent to the site, and woodland blocks, treelined paths and individual trees with Tree Preservation Orders (TPOs).

5.1.79 Of the potential ecological receptors which could be impacted a number were discounted. These ecological receptors with an explanation are detailed below.

- Bat species –limited foraging potential and a lack of roosting potential within the Project site.
- Water voles – no burrows or other signs of the presence of water voles were identified on the Project site or in adjacent areas and the site is considered to provide limited opportunities for the species as no flowing watercourses are present within it.
- Great crested newt – three ponds were identified in within the Project Site and all were found to have poor suitability for great crested newts.
- Terrestrial invertebrates – due to the Project Site predominantly comprising bare ground, it lacks suitable habitat to support terrestrial invertebrates.
- Fish and fish habitats – no watercourses exist within the site boundary and the closest watercourse is 60 m away and separated from the site by a public path. Given this, the risk of direct damage to fish habitats and direct fish fatalities which could potentially be caused by pollution incidents including inputs of silt is deemed unlikely.

5.1.80 The following Important Ecological Features (IEFs) have therefore been identified for the Project site or adjoining areas and are considered further in the assessment:

- habitats;
- otter;
- badger;
- reptiles;
- red squirrel; and
- marine mammals.

Assessment of Construction Effects

Designated Sites

5.1.81 The Project site is located within 0.1km of to Southannan Sands SSSI and Ballochmartin Bay SSSI, both designated for intertidal marine habitats, saline lagoons and sandflats. Any impact as a result of the construction phase of the development is likely to be derived from a pollution incident.

5.1.82 Mitigation and control measures to ensure that there would no potential for effects on the designated site as a result of runoff pollution are set out in Chapter 8 Hydrology and Flood Risk and Chapter 9 Hydrogeology, Geology and Ground Conditions. Control measures for construction dust are set out in Appendix 2.1 Code of Construction Practice (CoCP). These measures have been developed to ensure that effects on the designated site would not be significant.

5.1.83 The magnitude of the impact has been assessed as negligible. The conservation value of the receptor would be high sensitivity. Taking into account the mitigation measures proposed, the overall effect on the designated site during the construction phase of the development is assessed as Minor Adverse (not significant).

Habitats

5.1.84 The construction of the Project would result in the permanent loss of habitats beneath the footprint of the central factory plot and shading below the overhead cable conveyor system. These areas have been calculated in accordance with Chapter 2: Project Description with the results presented below in Table 5.9.

Table 5.9: Habitat Loss and Change within the Project Site

Phase 1 Habitat type	Project site (ha)	Permanent habitat loss (ha)	Habitat change (ha)	% of total habitat in site impacted	% of impacted habitats lost	% of impacted habitats changed
A2.1: Scrub - dense/continuous	2.04	0.22	-	10.78	10.78	-
B2.2: Neutral grassland - semi-improved	2.96	-	0.05	1.69	-	1.69
C3.1 – Other tall herb and fern - ruderal	0.35	0.06	-	17.14	17.14	-
J1.3 – Cultivated/disturbed land - ephemeral/short perennial	1.73	-	-	-	-	-
J3.6 – Buildings	0.05	-	-	-	-	-
J4 – Bare ground	39.71	28.05	0.03	70.71	70.64	0.08
Hardstanding	3.83	-	0.46	12.01	-	12.01
Total	**50.67**	**28.33**	**0.54**			

5.1.85 The total area of habitat to be lost would be 28.33 ha with the total area of habitat change of 0.54 ha.

5.1.86 A change in habitat is anticipated below the overhead cable conveyor system as a result of shading. The main habitat type to be affected is 0.05 ha of semi-improved grassland assessed as being of limited ecological value. The majority of the raised conveyor would travel along the existing pier.

5.1.87 It is anticipated that the habitats around the perimeter will form part of the enhancement for the overarching Hunterston PARC ecology and landscaping strategy so will not be directly affected by the development.

5.1.88 The dominant habitat on the site is bare ground which makes up 28.05 ha of the overall area and to be lost as a result of the proposed development as is of negligible value. The other small areas of habitats lost or changed on site have been assessed as minor, while the overall conservation value of the habitats present has been assessed of local value and predominantly of a low sensitivity. Therefore, the overall effect of the construction phase of the Project on the habitats present when taking in consideration the proposed mitigation is deemed to be Minor Adverse (not significant).

Protected Species

Otters

5.1.89 In the absence of mitigation, the loss of habitat within the Project site is unlikely to affect otter. Otter activity is most commonly associated with watercourses (though they will forage across terrestrial habitats at certain times of year) and no watercourses exist within the site. Furthermore, any signs of the species were identified outside the Project site boundary. Due to distance from proposed access tracks, it is also considered that injury/death from construction traffic is unlikely.

5.1.90 The magnitude of any impacts associated with the construction phase of the development on otters have been assessed as low, with the international conservation value of otter species assessed as of medium sensitivity in the context of the development. As such, taking into account the mitigation as proposed in paragraph 5.1.71et. seq. the overall effect to this IEF is assessed as Minor Adverse (not significant).

Badger

5.1.91 In the absence of mitigation, the loss of habitat within the site boundary and associated buffer is highly unlikely to affect badger. No active setts were identified within the project site and associated buffer, and ground associated with the site itself is largely bare and not considered optimal for foraging or sett construction. It is possible that badger may commute through the area on occasion from nearby Allan Wood to the east, which may pose potential traffic collision risk to any individuals. As such, it is considered that construction would have a minor adverse impact leading to a Minor Adverse (not significant) effect on badger.

Reptiles

5.1.92 Without appropriate mitigation the loss of habitat is unlikely to affect reptile species. It is anticipated that permanent loss of suitable reptile habitat is unlikely, and the magnitude of any impacts associated with the construction phase of the development have been assessed as low.

5.1.93 Reptiles are known to be susceptible to disturbance from humans, and there is the potential for low levels of displacement as a result of construction activities. It is therefore considered that taking into account the mitigation as proposed in paragraph 5.1.72, the overall effect to this IEF is assessed as Minor Adverse (not significant).

Red Squirrel

5.1.94 No red squirrel resting sites or feeding signs were found within the Project site, however; a squirrel drey was noted just outwith the eastern site boundary. Due to the nature of any construction

disturbance to the species being temporary and short term, the magnitude of any impacts associated with the construction phase of the development have been assessed as low.

5.1.95 As there are no trees within the site that could support the species, the associated effects of the construction phase of the Project to red squirrel, taking into account all proposed mitigation, is assessed as Minor Adverse (not significant).

Marine Mammals

5.1.96 NatureScot has advised that the marine mammals harbour porpoise, bottlenose dolphin, common dolphin, minke whale, harbour seal and grey seal are found in the Firth of Clyde, as is basking shark. There is the potential for these species to be affected by noise during construction.

5.1.97 As outlined in Chapter 2, piling will be used as part of the development to construct foundations for some of the buildings proposed. All piling will be undertaken onshore, and the method used will be auger piling with the exception of sheet piling around the basement for the extrusion tower. While there is potential for noise to be transmitted from onshore piling operations, via ground based vibrations, these are expected to be minimal and would not represent any risk to marine species.

5.1.98 Although noise measurements for auger piling are not available, for comparison, the 'Review of Existing Data on Underwater Sounds Produced by the Oil and Gas Industry' (REDUSPOG; Wyatt, 2008) provides received sound levels from an oil and gas exploratory drilling ship in water 110 m deep, which may be considered to be a considerable over-estimate of sound emissions for a land-based auger piling. These data indicate source levels could be in the order of 141 dB Root Mean Square (RMS) re 1 µPa m. These levels (for drilling in the marine environment) are expected to be similar or below levels expected in a busy working harbour, however, land based auger piling would result in considerably lower levels of underwater noise as the noise and vibrations would be significantly attenuated through the ground and sediment before reaching the marine environment.

5.1.99 As such, it is highly unlikely that any land based piling operations would be perceived by marine mammals against the existing background noise, much less represent a risk of injury or behavioural disturbance.

Further Mitigation

5.1.100 Where further mitigation is required during construction of the Project, relevant documents will be reviewed and updated to ensure appropriate protection is afforded to IEF's.

5.1.101 Further surveys for INNPS are to be completed prior to construction to ensure that relevant guidance and legislation is adhered to, and to minimise the spread of invasive species.

Monitoring

5.1.102 Where monitoring is required during construction of the Project, relevant documents will be reviewed and updated to ensure appropriate protection is afforded to IEF's. This will include updating the requirement for monitoring where any additional impacts are identified.

Accidents and/or Disasters

5.1.103 During the construction phase, fuel and/or oil leaks from plant and machinery could cause a potential pollution incident. The mitigation as proposed in paragraph 5.1.69et. seq. would minimise the risk to ecologically sensitive areas.

5.1.104 Documentation will be reviewed and updated throughout the construction phase if further effects or mitigation are identified.

Assessment of Operational Effects

Designated Sites

5.1.105 It is not considered that any additional mitigation measures will be required during the operational phase. Once the infrastructure is in place any potential for impact will be lesser than that identified within the construction phase. If mitigation previously stated from the construction phase is carried through during the operational phase, no significant impacts are predicted.

Habitats

5.1.106 Once the infrastructure is in place, it is not anticipated that any further habitat loss would be experienced. The use of service vehicles across the Site has the potential for fuel spills/pollution events; however, the frequency of this is likely to be very low, and the implementation of best practice (i.e. all vehicles must contain spill kits) would result in a negligible impact on habitats during operation leading to a Minor Adverse (not significant) effect.

Protected Species

5.1.107 During the operational phase of the Project there is the potential for disturbance to protected species through human presence on the site and during production and maintenance activities. Any protected species identified around the site will have become habituated to any noise/vibration as a result of the construction phase.

5.1.108 Any activity and use of vehicles across the Project Site will be significantly reduced from those experienced during the construction phase, this in tandem with the continued implementation of suitable speed limits, the potential impacts are assessed as being of low magnitude and low sensitivity and their effects as Minor Adverse (not significant) for all species.

Marine Habitats and Associated Species

5.1.109 No impact pathways have been identified for marine species and habitats as a consequence of shipping associated with the Project. As described in Chapter 2, Cable Laying Vessels (CLVs) will make infrequent visits for up to a week at a time to receive finished lengths of cable. Such visits would represent a negligible change to shipping expected at Hunterston PARC.

5.1.110 Biosecurity protocols already in place will be enforced at Hunterston Port to eliminate risks of importation of invasive / non-native marine organisms.

Further Mitigation

5.1.111 No further mitigation is anticipated to be required following the completion of the construction phase. Documentation will be reviewed and updated throughout the construction phase if further effects or mitigation are identified.

Future Monitoring

5.1.112 No further monitoring is anticipated to be required following the completion of the construction phase. Documentation will be reviewed and updated throughout the construction phase if further effects or monitoring are identified.

Accidents/Disasters

5.1.113 During the operational phase fuel and/or oil leaks from plant and machinery could cause a potential pollution incident. The mitigation as proposed in paragraph 5.1.74 would minimise the risk to ecologically sensitive areas.

5.1.114 Documentation will be reviewed and updated throughout the construction phase if further potential risks are identified.

Assessment of Cumulative Effects

5.1.115 Considering that Hunterson PARC continues to be developed it is possible subsequent development proposals would be submitted that would run concurrently with the XLCC Hunterston development. With successful mitigation and monitoring it is expected that any cumulative effects would be from the construction rather than the operation phase of the development.

5.1.116 Successful implementation of mitigation, specifically when considering traffic management and road use this is likely going to be non-significant in EIA terms. However, documentation will be reviewed and updated throughout the construction phase if further potential risks are identified.

Summary of Effects

5.1.117 A summary of likely significant effects on Important Ecological Features is provided in Table 5.10.

Table 5.10: Summary of Likely Environmental Effects on Ecology

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Construction phase							
Designated sites (Southannan Sands SSSI)	High	Temporary direct impact from pollution	Short term	Low	Minor adverse	Not significant	
Habitats	Low	Permanent direct habitat loss	Long term	Medium	Minor adverse	Not significant	
Otter	Medium	Temporary direct impact from pollution	Short term	Low	Minor adverse	Not significant	
Badger	Low	Permanent direct loss of commuting pathways	Medium term	Low	Minor adverse	Not Significant	
Reptiles	Low	Permanent direct habitat loss	Medium term	Low	Minor adverse	Not Significant	
Red Squirrel	Medium	Temporary direct disturbance	Short term	Low	Minor adverse	Not Significant	
Marine mammals	High	None					
Operational phase							
Designated sites (Southannan Sands SSSI)	High	Temporary direct impact from pollution	Short term	Low	Minor adverse	Not Significant	
Habitats	Low	Temporary direct impact from pollution	Short term	Low	Minor adverse	Not Significant	
Protected species	Low (badgers/reptiles) Medium (otter/red squirrel)	Temporary direct disturbance	Short term	Low	Minor adverse	Not Significant	

ECOLOGY AND NATURE CONSERVATION (PART 2 – NON-BREEDING BIRDS)

Introduction

5.1.118 Part 2 of this chapter considers the likely significant effects on ornithological receptors associated with the construction, operation and decommissioning of the proposed XLCC Cable Factory – Hunterston (hereafter referred to as the 'Project'). The effects associated with the construction phase of the Project on ornithological receptors can be considered to be representative of reasonable worst-case decommissioning effects, therefore a separate assessment of the decommissioning phase has not been undertaken as part of this assessment.

5.1.119 The specific objectives of this chapter are to:

- describe the ornithological baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect and cumulative effects; and
- describe the mitigation measures proposed to address likely significant effects.

5.1.120 Details of the proposed Project are set out in Chapter 2: Project Description of this Environmental Impact Assessment (EIA) Report. This chapter concentrates on the potential impacts of the Project within and adjacent to the Project site boundary. Cumulative effects of the Project, when combined with other developments in the local area, have also been considered.

5.1.121 All staff who have contributed to fieldwork and this chapter have relevant experience, an undergraduate or higher postgraduate degree in relevant subjects, or hold professional membership of the Chartered Institute of Ecology and Environmental Management (CIEEM).

5.1.122 This chapter should be read in conjunction with Appendix 5.1 Ecology and Nature Conservation (Part 2) Technical Report. where full details of the surveys, data collected, methodologies and results are reported.

5.1.123 Where relevant, all figures and the technical appendix are referenced within the text.

Assessment Methodology

Planning Policy Context

5.1.124 The scope of this assessment has been informed by relevant policies in the following:

- The National Planning Framework (NPF) for Scotland (Scottish Government, 2014a);
- Scottish Planning Policy (SPP) (Scottish Government, 2020);
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, which transpose the EIA Directive into the Scottish planning system;
- Planning advice Note (PAN) 1/2017 – Environmental Impact Assessment (Scottish Government 2017);
- PAN 51: Planning Environmental Protection and Regulation (revised 2006);
- PAN 60: Planning for Natural Heritage (Scottish Government 2008);
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000);

- Planning Circular 3 2011: the Town and Country Planning (Environmental Impact Assessment (Scotland) Regulations 2011;
- The North Ayrshire Local Development Plan 2 (North Ayrshire, 2019); and
- The Hunterston PARC Development Framework (2021).

Relevant Legislation and Guidance

5.1.125 The key legislation and guidance relevant to this assessment are as follows:

- Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive);
- Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive);
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive);
- The Conservation (Natural Habitats &c.) Amendment (Scotland) Regulations 2012, relating to reserved matters in Scotland;
- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;
- The Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation Act (Scotland) Act 2004 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- Scottish Planning Policy;
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (V1.1);
- The State of the UK's Birds 2020 (Burns *et al*., 2020);
- Population Estimates of Wintering Waterbirds in Great Britain (Frost *et al.*, 2019);
- Bird Monitoring Methods (Gilbert *et al*., 1998);
- Birds of Conservation Concern (BoCC) 5: the status of our bird populations (Stansbury *et al*., 2021); and
- Scottish Biodiversity List.

Study Area

5.1.126 The intertidal and near shore coastal bird survey area (the 'Site') extended for approximately 4.5km along the North Ayrshire coast from Hunterston Sands (NS 19706 52422) to the eastern end of Seton Sands (NS 20866 55085). Given the extent of this survey area it was divided into two discrete count sectors (Sectors A and B) (shown in Figure 5.5), identified as follows:

- Sector A was approximately 1.2km wide and extended from the pier north across Fairlie Sands; and
- Sector B was approximately 1.6 - 2.3km wide and extended from the pier south across Southannan Sands.

5.1.127 Both survey sectors extended out to 1.5km from the Mean High-Water Springs (MHWS) mark. Both sectors incorporated a 500m zone extending from the site boundary.

Baseline Methodology

Desk Study

5.1.128 A desk study was undertaken to collate relevant information on all sites with designated ornithological features including Ramsar sites, Special Protected Areas (SPAs), Sites of Special Scientific Interest (SSSIs) and Sites of Importance for Nature Conservation (SINCs) where there may be existing ecological connectivity between the Project site and qualifying bird populations.

5.1.129 A search for all designated sites within a 20km radius of the Project site was made using online sources, allowing the identification of all designated sites with qualifying ornithological interests. The search radius of 20km is consistent with published connectivity distances, across which any bird populations may have interaction with the Site. The online sources used to obtain this information were:

- NatureScot Sitelink database;
- JNCC website;
- Defra MAGIC website; and
- Scotland's Environment Web.

5.1.130 In addition, information from both confidential and public domain survey data, scientific publications, grey literature (information not produced or controlled by commercial publishers, e.g. policy documents, web content, conference proceedings, etc.) and Environmental Statement (ES)/EIA/Consultations for nearby developments was searched to build an understanding of bird communities in and around the Site. This included information collected from previous surveys for both the Project Phoenix and Hunterston Bulk Terminal developments.

Field Survey

5.1.131 To identify the distribution of birds, the count sectors were segregated into three distance bands; 0 - 500m, 500m - 1km and 1km - 1.5km from MHWS.

5.1.132 Surveys of each sector were conducted by a surveyor at approximately monthly intervals between September and December 2021. During each survey the number of birds present along the foreshore and near shore coastal waters was counted and ascribed to one of the three distance bands.

5.1.133 On a single day once per month, Sector A was surveyed by one observer and Sector B was surveyed by a second observer. Observers used a snapshot method: every hour, observers counted all waterbirds within the sector, using binoculars and a telescope. Species, numbers and behaviours, such as foraging and non-foraging (e.g., preening, bathing, roosting or loafing), were marked onto field maps using standard British Trust for Ornithology (BTO) codes. This method was based on the high tide (core count) method of the BTO/JNCC/RSPB/WWT WeBS scheme. The process was repeated over seven hours to give seven counts for each survey day. The programme of monthly surveys covered a range of times of day, tidal state, and spring and neap tides (which both occur twice in a lunar month).

5.1.134 Field records were transferred to a Geographic Information System (GIS) webmap. This produced accurate information on the distribution of birds within the study area and enabled maps to be produced so that areas of ornithological importance could be identified.

5.1.135 Weather conditions including wind speed (using the Beaufort Scale), cloud cover (estimated as eighths or octas of the sky), visibility and temperature were also recorded as well as sources of disturbance to birds encountered during surveys. Details of the intertidal and near shore coastal bird survey effort is presented in Table 1 of Appendix 5.1 Ecology and Nature Conservation (Part 2) Technical Report.

Consultation

5.1.136 To ensure comprehensive coverage of ecological issues, key Statutory Nature Conservation Bodies (SNCBs), Environmental Protection Agencies (EPAs), and non-governmental organisations (NGOs) relevant to ornithology were consulted during the Project's Scoping process.

5.1.137 Table 5.11 summarises the consultation responses received regarding ornithology and provides information on where and/or how they have been addressed in this assessment.

Table 5.11: Consultation Responses to this Chapter

Date	Consultee and Issues Raised	How/Where addressed
13th December 2021	**NatureScot** Wintering and breeding birds are present in and around the (Southannan Sands) SSSI and development site in such numbers that the area is classified as of regional importance for waders and wildfowl (Hunterston Construction Yard Environmental Review Peel Ports and Envirocentre February 2017 p1610). We welcome the survey commitment proposed to address this issue. Two SSSIs (Kames Bay and Ballochmartin Bay SSSI) are located 2.2 km to the north east and 2.7km to the north of the proposal area respectively. The notified features of these two sites are the flora and fauna of the intertidal area (the area between the highest and lowest tidal levels). See NatureScot SiteLink for more detail: Kames Bay SSSI and Ballochmartin Bay. In addition to these SSSIs, Table 5.1 of the Scoping report identifies a large number of SSSIs within 20km of the proposed development. We agree that, due to the nature of the project and the separation distance to these designated sites, they can be scoped out of the EIA As the proposed Extrusion Tower is in excess of 150m in height, night-time lighting will be required. We advise that the applicant considers effects on birds in relation to night time lighting of tall structures as part of their assessment of the proposed development. The sensitivity to birds arising from any lighting required will depend on the species likely to be affected as well as the extent of lighting required. Relevant issues to consider will include the nature of the lights (number and position) and how long they will be lit for.	Detailed baseline characterisation is presented in Appendix 5.1. Potential effects are addressed in this Chapter.
17th December 2021	**North Ayrshire Council** The EIA Report should include an assessment of the potential effects on	Potential effects on birds associated with Southannan Sands SSSI are addressed in this Chapter.

Date	Consultee and Issues Raised	How/Where addressed
	important ecological features and should detail proposed mitigation and/or compensation measures required to avoid, minimise, restore or offset adverse effects and demonstrate positive effects for biodiversity. NatureScot advise that potential impacts on the Southannan Sands SSSI requires to be assessed in accordance with their guidance. The Kames Bay and Ballochmartin Bay SSSIs can be scoped out.	

Assessment Criteria and Assignment of Significance

5.1.138 The method of assessment for this chapter follows that of CIEEM (2018) guidance. The term Important Ornithological Features (IOFs) is used for those species and habitats identified in the assessment. For each impact with the potential to affect the relevant IOFs, the assessment considers the following parameters:

- the value and importance of the IOF considering its national and regional conservation status;
- the extent of the impact and whether this is positive or negative in its influence;
- the magnitude, duration and timing of the impact; and
- the impact's frequency and ease of reversibility.

5.1.139 Determination of the significance of effects is a process that involves defining the magnitude of the impacts and the sensitivity of the ornithology IOFs. The assessment similarly includes consideration of any proposed mitigation to avoid or minimise the effect of any potential impact to the relevant IOFs and the identification of potential cumulative impacts from other developments (i.e. whether they are negligible, minor, moderate or major). Effects can be either adverse or beneficial. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the ornithology IOFs.

Receptor Sensitivity/Value

5.1.140 The sensitivity of IOFs has been considered against the ability of a receptor to adapt to a given impact, its tolerance to that impact and its ability to recover back to pre-impact conditions.

5.1.141 Tolerance is defined as the susceptibility of a species to disturbance, damage or death, from a specific external factor. Recoverability is the ability of the same species to return to a state close to that which existed before the activity or event which caused change. It is dependent on the ability of the local population to recover subject to the extent of disturbance/damage incurred. Information on these aspects of sensitivity of the IOFs to given impacts has been informed by the best available evidence from scientific research on such receptors.

5.1.142 The conservation value of IOFs (Table 5.12) is based on standard guidelines by CIEEM (2018) which places the conservation value of IOFs within a geographical frame of reference (e.g. International, National, Regional). This is based on standard guidance and available information, and the distribution and status of the ornithological features being considered (e.g. qualifying interest of a nearby SPA). The first and second components of species sensitivity are defined as the conservation value of a species and its vulnerability to each particular impact.

Table 5.12: Value of ornithological receptors

Level of Importance	Example of IOF
International	Species listed as qualifying feature of an internationally designated site (SPA/Ramsar Site, including candidate sites). Birds listed as Annex I/Schedule I (which include birds outside protected areas) when there is clear connectivity with internationally designated populations or where populations are at levels with sufficient conservation importance to meet criteria for SPA selection
National	A species listed as a qualifying feature of a nationally designated site (e.g. SSSI); Impacts on ecologically sensitive species (e.g. wintering populations <900 individuals); and/or Species which are present in numbers greater than 1% of the national population.
Regional	Species present in regionally important numbers, e.g. more than 1% of regional population; Species that are subject to conservation action plans e.g. Scottish Biodiversity List/UKBAP/LBAP; and/or Birds that form part of the cited interests of a Local Nature Reserve, or some local–level site designation.
District	Bird species where a significant proportion (greater than 1%) of the sub-region/district population uses the site.
Local	Any other species of conservation value (e.g. Amber- or Red-listed species listed under BoCC) which are not covered by the categories above.
Negligible	Common and widespread species of little or no conservation importance (green-listed BoCC species).

5.1.143 The criteria for defining sensitivity in this chapter are outlined in Table 5.13 below:

Table 5.13: Defining the sensitivity on important ornithological features

Sensitivity	Typical Descriptors
High	No or limited ability to adapt behaviour; survival and reproduction rates may be affected. No or limited tolerance; effect may cause a change in both reproduction and survival of individuals. No or limited ability for the animal to recover from the effect
Medium	Ability to adapt behaviour so that reproduction rates may be affected but survival rates are not likely to be affected. Some tolerance; effect unlikely to cause a change in both reproduction and survival rates. Ability for the population to recover from the effect.
Low	Receptor is able to adapt behaviour so that survival and reproduction rates are not affected. Receptor is able to tolerate the effect without any impact on reproduction and survival rates. Receptor is able to return to previous behavioural states/activities once the impact has ceased.
Negligible	Very little or no effect on the behaviour of the receptor.

5.1.144 Whilst it is important to assess the importance or value of the species found during baseline surveys, the most critical consideration with regards to the EIA is the importance of the site for these species at a population level. This is because it is impacts on the bird population using the site of the Project that are required to be assessed by the EIA process.

5.1.145 Therefore, in the following assessment, for each IOF present at the site, a value is given of the site level of importance from high through to negligible. The site level of importance is a function of the species value in combination with the size of the population occupying or reliant on the site. For

example, if an internationally important species has been recorded at a site only once, or only over-flying the survey area, then the site level of importance would be considered negligible.

Magnitude of Impact

5.1.146 The magnitude of change is described as a quantitative value as far as is practicable. For example, magnitude of change can be quantified as a percentage decline of a population or as the area of habitat from which birds will be displaced.

5.1.147 The magnitude of change from a given development will differ between species and populations, and therefore assessing the magnitude requires consideration of birds' behavioural sensitivities, population sizes and conditions (including, among other considerations, the degree or habituation to pre-existing background levels of human activity). Examples include species' responses to disturbance, and the greater vulnerability of small, declining and isolated populations to the impacts of additional pressures.

5.1.148 In addition, the magnitude of an impact is influenced by the duration of the impact, irreversibility and cumulative effects of other impacts. With regard to duration of impact, it can be defined as permanent (beyond 25 years duration), long-term (15-25 years), medium-term (5-15 years) and short-term (up to 5 years).

5.1.149 A knowledge of the populations' ability to recover from impacts is required to assess the duration of the effect. For example, mortality events for species with small population sizes and low reproductive output (such as raptors) will take considerably longer than abundant and widespread species that have high output and will fill vacant territories and replace numbers rapidly (e.g. small passerine species).

5.1.150 Consideration of the above factors allows quantification of the magnitude of the effect. Table 5.14 presents magnitude at four levels, from major to negligible; this is the scale by which effect or change is quantified in this EIA Report. Note that the magnitude of effect is sometimes referred to as magnitude of change, as the level of effect can be quantified in terms of change in population and range.

Table 5.14: Defining the magnitude of effect on important ornithological features

Magnitude	Typical Descriptors
High	Would cause the loss of a major proportion or whole feature/population or cause sufficient damage to a feature so as to immediately compromise long-term viability. For example, more than a 20% decline in a population which an area is able to support. (Adverse)
	Long-term, large-scale increase in the population trajectory over a generational scale. (Beneficial)
Medium	Effects that are detectable in the short and longer term, but which should not alter the long-term viability of the feature/population, for example 10-20% decline in a population which an area is able to support. (Adverse)
	Benefit to the habitat influencing foraging efficiency resulting in increased reproductive potential and increased population health and size. (Beneficial)
Low	Minor effects, either sufficiently small-scale or short in duration that would cause no long-term decline in a feature/population, for example less than a 10% decline in a population which an area is able to support. (Adverse)
	Minor benefit to, or addition of, one or more key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring. (Beneficial)
Negligible	A potential impact that is not expected to affect the feature/population in any meaningful way, with no detectable decline in population/distribution. Any change from baseline conditions is predicted at <1%. (Adverse)
	Very minor benefit to, or positive addition of one or more characteristics, features or elements. (Beneficial)

Magnitude	Typical Descriptors
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of Effects

5.1.151 Having followed the process of assessing the importance of bird populations and quantifying the magnitude of impact (through consideration of the sensitivity of the population and duration of effect), the final stage of the EIA process is to establish the significance of the impact.

5.1.152 An ecologically significant effect is defined as an impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species (CIEEM, 2018). The effect is assessed within a specific geographic context (i.e. at the scale at which the ecological feature was valued). Effects are considered to be significant under the EIA Regulations where the effect is classified as being 'major' or 'moderate', while effects assessed as 'minor' are not significant.

5.1.153 Table 5.15 shows the assessment matrix used to guide the assessment of significance.

Table 5.15: Matrix for determination of significant impacts

Sensitivity	Magnitude of Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
Medium	Negligible or minor	Minor	Moderate	Moderate or major
High	Minor	Minor or moderate	Moderate or major	Major

5.1.154 Using the above matrix, further consideration is then given to the following:

- Major: effects are likely to be important considerations at a regional or district scale but which, if adverse, are potential concerns to the Project, depending upon the relative importance attached to the issue during the decision-making process;
- Moderate: effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource;
- Minor: effects may be raised as local issues, but which are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the Project; and
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

5.1.155 The final assessment of whether a significant effect is likely is completed by taking the mitigation measures that are adopted as part of the Project into account, including both the mitigation incorporated into the design of the Project and mitigation required to address residual impacts. This requires an assessment of the likelihood of successful mitigation being achieved; the mitigation proposed needs to be qualified in terms of the probability of success. The assessment of the likely success of any mitigation and hence the significance of any effects is based on both professional judgement and experience of other mitigation schemes. In general, a precautionary approach is advisable in determining the outcome, however a realistic rather than worst-case scenario assessment is used. In determining likely significant effects on protected sites a precautionary approach is always adopted.

Limitations of the Assessment

5.1.156 Ornithological data are inherently only a sample of baseline activity at any one period. The survey results contained in this report are considered accurate for 24 months, provided there are no considerable changes to site conditions.

5.1.157 At the time of preparing this report, intertidal survey results were available for the period covering September to December 2021. There is survey data available for the breeding season. This assessment therefore focusses on the impacts of the Project on wintering bird populations only. However, this is the key period over which the potentially important ornithological features are most likely to be present.

5.1.158 The assessment of likely significant effects is based as much as possible on published scientific research and the most current known population data. When empirical data are lacking or insufficient, the judgement of experienced ornithologists with detailed knowledge of bird behaviour and ecology is required. Any assumptions made during this assessment are clearly stated. With regard to uncertainty of the magnitude of adverse effects, the precautionary principle is applied; for example, a lack of full scientific certainty should not be used as a reason for postponing or failing to take measures to mitigate these adverse effects.

5.1.159 At the time of report production, WeBS data and data from the South West Scotland Environmental Information Centre (SWSEIC) had not been received, and so cannot be commented on. Consideration had been given to data collected for previous development proposals falling within or close to this study area. These data could not be presented in this report due to the timeframe between information becoming available and the timing of the submission.

Baseline Environment

Current Baseline

Designated Sites

5.1.160 One designated site with connectivity to the Project site was identified within 20km: Southannan Sands SSSI, which is located adjacent to the western boundary of the Project and overlaps with the pier, and is designated for its intertidal marine habitats and saline lagoons, and sandflats.

5.1.161 Since it was originally designated, Southannan Sands SSSI has undergone significant change, through industrial reclamation and development, including the construction of the Hunterston Coal Terminal, an oil rig construction yard and a nuclear power station. Under the Nature Conservation (Scotland) Act 2004, the site was re-notified, and the boundary of the site amended. In 2013 NatureScot (formally SNH) reviewed the following ornithological features of the site:

- Aggregation of non-breeding birds - determined not to currently meet the SSSI selection criteria;
- Aggregation of breeding birds - determined not to currently meet the SSSI selection criteria; and
- Assemblage of breeding birds - determined not to currently meet the SSSI selection criteria.

5.1.162 Although not notified features of the site, the sandflats continue to support a variety of wintering, migratory and breeding wildfowl and waders, including species such as shelduck, eider, red-breasted merganser, oystercatcher, ringed plover, lapwing, curlew, whimbrel and redshank.

5.1.163 Between 2012 and 2016, wintering bird surveys of Southannan Sands, Hunterston Sands and Fairlie Sands were undertaken by another developer. The main species using the intertidal habitat were waders – predominantly oystercatcher and curlew, with smaller numbers of bar-tailed godwit, greenshank, redshank, dunlin, knot and ringed plover. Waterfowl were also common, including shelduck and wigeon with smaller numbers of mallard, teal and mute swan.

5.1.164 All three survey areas provided roosting habitat for oystercatcher and curlew, with the north east corner of Southannan Sands supporting the highest concentration of birds, with regular counts of up to 300 oystercatcher and 150 curlew.

5.1.165 As per the consultation responses received from NatureScot and North Ayrshire Council, all other designated sites, including the Ballochmartin Bay and Kames Bay SSSIs, were scoped out of further assessment.

Field Surveys

5.1.166 A total of 49 bird species were recorded during the wintering bird surveys undertaken between September and December 2021. Further details of the baseline characterisation for each species are included in Appendix 5.1: Ecology and Nature Conservation (Part 2 – Ornithology) Technical Report.

5.1.167 Ornithology field surveys were carried out from September 2021 to December 2022, as such the breeding season was not captured. However the lack of suitable habitat within the Project footprint suggests that the presence of breeding birds, particularly passerines, is likely to be negligible.

Future Baseline Conditions

5.1.168 Hunterston PARC, in which the Project site sits, is subject to an overarching development framework, which was submitted in October 2021 (Peel Ports, 2021). This framework includes education facilities, research and development offices and incubator hubs for new start-ups as a way of providing a healthy and sustainable commercial development. In the absence of development of the Project, it is reasonable to assume that development of more open mosaic habitats on previously developed land would probably occur however, there are unlikely to be any substantive changes in their extent or value to the ornithology.

5.1.169 The UKCP18 climate change projections (Met Office, 2018) indicate that in general, warmer, wetter winters and hotter, drier summers are predicted, though natural variations in weather patterns will continue from year to year. No clear trend in wind speeds or storms is predicted, though the data currently published cannot make projections for local conditions and wind gusts.

5.1.170 The majority of the coastal stretch in the vicinity of the Project has been ‘fixed’ by sea defences. Elsewhere, sea defences are further set back from more extensive areas of intertidal habitat. In the face of sea level rise and increased storm events, the normal response of coastlines and coastal habitat would be to migrate landward. However, this is not possible due to sea defences and therefore the coastal habitat becomes ‘squeezed’ due to erosion at the landward edge and the inability to redistribute by natural processes further inland. Eventually, the effect of hard engineering on retreating beaches will lead to loss of intertidal habitats and modification of subtidal zone habitats which wintering, migratory and breeding wildfowl and waders rely upon.

Mitigation Measures Adopted as Part of the Project

Designed-in Measures

5.1.171 It is anticipated that the habitats around the perimeter of the site will form part of the enhancement for the overarching Hunterston PARC ecology and landscaping strategy so will not be directly affected by the development.

5.1.172 External lighting would be designed to allow for night-time safety and security when required, incorporating the development’s operational requirements. The exterior lighting scheme design would aim to minimise lighting spillage into surrounding areas and discourage trespass, to comply with the Dark Skies Campaign and recommendations in the Society of Light and Lighting (SLL) Lighting Handbook (Chartered Institution of Building Services Engineers (CIBSE), 2018). Lighting

would be designed to be activated only when required. This will also reduce the risk of disturbance to roosting birds.

Construction Mitigation

5.1.173 All relevant mitigation measures will be implemented through the Project Code of Construction Practice (CoCP) and Construction Environmental Management Plan (CEMP), which will be prepared in consultation with, and to the satisfaction of North Ayrshire Council, SEPA and NatureScot. These will include measures such as:

- Application of SEPA Pollution Prevention Guidance (PPGs) and the delimitation of working areas to minimise damage to habitats;
- A minimum 50m buffer will be maintained, where practicable, between working areas, machinery and watercourses and ditches;
- Pollution prevention measures will be installed and maintained as appropriate, including sediment and dust mitigation measures;
- Chemicals, oils and hazardous materials will be securely stored wih apropriate containment in designated areas at a minimum distance of 50m from any watercourses;
- Spillage contingency kits will be provided in all site vehicles and there will be daily checks for oil and fuel leaks;
- Application of best practice in relation to the removal and storage of vegetation turfs, soils and peat to ensure effective reinstatement of vegetation wherever possible;
- Application of best practice techniques of construction to ensure that drainage patterns and water quality within the Project area are maintained; and
- Timing of earth works to avoid periods of heavy rain when the risk of fine sediment being transported is significantly increased.

5.1.174 Pollution incident response and drainage management measures will be prepared as a part of the CoCP and CEMP to minimise potential pollution effects.

5.1.175 An Ecological Clerk of Works (ECoW) will be employed to oversee key elements of enabling works and construction. This will be a suitably experienced individual, whose role will ensure works are carried out in accordance with the CoCP and CEMP to ensure compliance with international and national legislation and planning conditions. Once works are underway, the ECoW will provide ecological and pollution control advice and supervision for all relevant mitigation measures and monitoring.

5.1.176 Best practice measures for minimising the potential for disturbance and injury to wintering and breeding birds will be employed and detailed in the CoCP and CEMP. This will include:

- 'Toolbox Talks' conducted by a suitably experienced ECoW to explain how contractors can minimise the occurence of unpredictable/sudden bursts of noise;
- Clearing vegetation outside the breeding bird season (April to July inclusive). Where this is not practicable, surveys would be completed ahead of clearance works and an ECoW would oversee vegetation clearance to ensure there would be no damage to active bird nests or disturbance of protected species.

Operational Mitigation

5.1.177 Vehicles coming on site would be regularly checked for oil leaks to avoid risk of pollution. Spillage kits will be available. Best practice methodologies will be employed during any maintenance works to ensure the prevention of any pollution of habitats or watercourses, along with implementation of the site pollution incident response plan and drainage management plan.

Identification of Important Ornithological Features

5.1.178 The IOFs included within the assessment are those species recorded during the surveys that could be potentially affected by the Project. Species that were recorded in very small numbers or very infrequently during the baseline surveys are excluded because the risk of a significant effect on their populations is negligible.

5.1.179 The importance of ecological features is dependent upon their biodiversity, social, and economic value within a geographic framework of appropriate reference (CIEEM, 2018). IOFs have been identified based on biodiversity importance, recognised through international or national legislation, or through local, regional or national conservation plans, and on assessment of value according to the functional role of the species. This includes:

- Species listed on Annex 1 of the Birds Directive;
- Species populations which are of international importance in Scotland; and
- Populations occurring within the Project area which are considered to be of regional, national or international importance.

5.1.180 Geographical thresholds were defined as follows:

- International importance: a peak population estimate within the survey area which exceeds 1% of the international population estimate;
- National importance: a peak population estimate within the survey area which exceeds 1% of the national wintering population estimate; and
- Regional importance: a peak population estimate within the survey area which exceeds 1% of the regional wintering population estimate.

5.1.181 Following an initial review of species' abundances recorded during the surveys, the IOFs listed in Table 5.16 were taken forward for consideration in the impact assessment.

5.1.182 Although primary baseline data are lacking for most of the season, it is considered unlikely that the Project would have any effects on seabirds. This is because:

- There are no designated sites with qualifying seabird species within 20km of the Project;
- With the exception of the gull species, all these species are obligate marine foragers and therefore the Project is unlikely to affect foraging opportunities. Shag and cormorant are the only species likely to forage in the near shore zone, the remaining species are highly pelagic foragers; and
- The near shore area of disturbance is small in size and distant from colonies and seabirds have a great deal of flexibility in their foraging behaviour.

5.1.183 Therefore, it is expected that adverse effects on seabirds would be negligible and they are scoped-out of further consideration in this assessment.

5.1.184 A small number of Amber- and Red-listed passerine species, including song thrush, starling and meadow pipit were recorded within the survey boundary during the intertidal surveys. Adverse effects on passerines are not anticipated as a result of the Project as the habitat with the Project footprint is unsuitable, and they are therefore scoped-out of further consideration in this assessment.

5.1.185 Further details of species scoped out of the assessment are provided in the results sections of Appendix 5.1: Ecology and Nature Conservation (Part 2 – Ornithology) Technical Report.

Table 5.16: IOFs taken forward for consideration in the impact assessment

Species	Conservation Value	Justification
Bar-tailed godwit	BoCC Amber, Birds Directive Annex 1	Species of international importance in Scotland* High abundance recorded in survey area, adjacent to Project boundary
Curlew	BoCC Red	Species present in Scotland for which a decline of 25% or more in abundance or range has occurred in Scotland over the last 25 years* High abundance recorded in survey area, adjacent to Project boundary
Dunlin	BoCC Red	Species of international importance in Scotland* High abundance recorded in survey area, adjacent to Project boundary
Greenshank	BoCC Amber	The survey area regularly supports >1% of national wintering population
Lapwing	BoCC Red	Species present in Scotland for which a decline of 25% or more in abundance or range has occurred in Scotland over the last 25 years* High abundance recorded in survey area, adjacent to Project boundary
Oystercatcher	BoCC Amber	High abundance recorded in survey area, adjacent to Project boundary
Redshank	BoCC Amber	Moderate abundance recorded in survey area, adjacent to Project boundary
Shelduck	BoCC Amber	High abundance recorded in survey area, adjacent to Project boundary
Wigeon	BoCC Amber	High abundance recorded in survey area, adjacent to Project boundary

*Identified through a review of the Scottish Biodiversity List

5.1.186 Threshold values for international populations were derived from Furness (2015). National populations of wintering thresholds derived from the most current WeBS reports (Frost *et al.*, 2019 and Woodward *et al.*, 2020).

5.1.187 In the absence of WeBS data, professional judgement has been used where a moderate to high abundance of species were recorded in the survey area, and therefore whether they are taken through to the assessment stage.

Assessment of Construction Effects

Designated Sites

5.1.188 The Project site is adjacent to Southannan Sands SSSI, designated for intertidal marine habitats and saline lagoons, and sandflats.

5.1.189 Control measures to ensure that there would no potential for effects on the designated site as a result of runoff or pollution are set out in Chapter 8 Hydrology and Flood Risk and Chapter 9 Hydrogeology, Geology and Ground Conditions. Control measures for construction dust are set out in and Chapter 13 Air Quality. These measures have been developed to ensure that effects on the designated site would not be significant.

5.1.190 The magnitude of the impact has been assessed as negligible. The conservation value of the receptor would be high sensitivity. Taking into account the mitigation measures proposed, the overall effect to the designated site during the construction phase of the development is assessed as **minor adverse**, which is not significant in EIA terms.

Important Ornithology Features

5.1.191 The predicted effects on the assessed IOFs at the site comprise disturbance of short duration during construction. Other effects of habitat loss and/or population decline (of wintering population) are considered to be absent or negligible. Such effects are considered highly improbable because:

- the construction of the Project would result in the permanent loss of habitats beneath the footprint of the central factory plot and shading below the overhead cable conveyor system. There would be limited impacts on the extent or condition of intertidal habitat during construction or operation. Therefore, effects by loss of intertidal foraging and roosting habitat for waders will be negligible;
- there are no bird populations for which sites are designated within 20km of the Project where effects on survival are considered likely (either direct impacts on breeding site or indirect effects on foraging adults).

5.1.192 Therefore, discussion and assessment of potential effects on IOFs is focussed on the effects of disturbance during construction.

5.1.193 The potential responses to disturbance by estuarine birds include the following behaviours:

- redistribution of birds (either short-term or complete avoidance/abandonment);
- reduced food intake; either due to reduced foraging time or by displacement from high quality foraging sites;
- increased energy expenditure due to energetic cost of being flushed from roost /feeding sites and, where occurring, redistribution to new locations;
- physiological cost from increased stress; and
- direct mortality.

5.1.194 Disturbance at high-tide roost sites is considered the most likely effect for wintering species (notably waders) in the vicinity of the Site. Whilst this disturbance would not incur costs by reduced feeding, regular disturbance of wader high-tide roosts has been shown to lead to population declines even if suitable feeding conditions remain available (Catry *et al.,* 2011).

5.1.195 The response of roosting (and feeding) waders to disturbance at the Site is difficult to predict, as studies have revealed that this is affected by the species involved, type of disturbance, degree of habituation, availability of alternative roost/feeding locations, and other factors such as the individual bird's condition and need for feeding or resting.

5.1.196 Kirby *et al.* (1993) studied disturbance effects on waders roosting at the Dee Estuary, including oystercatcher and ringed plover. Roosting oystercatcher exhibited a 'medium' response to disturbance (redistributing to alternative roosts outside the study area but within the estuary) and ringed plover exhibited a 'low' response (staying at the same roost or moving a short distance within the study area).

5.1.197 Several studies show that the behavioural response to disturbance is mediated significantly by habituation to the source of disturbance. For example, Urfi *et al.* (1996) found that oystercatcher 'escape distance' (i.e. the distance at which birds take flight on approach of people) reduced when people are present more frequently. However, habituation to one source of regular disturbance would not necessarily lead to greater tolerance of novel disturbance, such as construction activity.

5.1.198 Whilst the high levels of disturbance at the Site may lead to some habituation by waders, it is clear that at this location, wader roosts are selected at locations where disturbance is minimised; where access by people and dogs is difficult (restricted and fenced-off areas). Alternative sites within the wider area may provide alternative roosting areas, however these sites may not be assumed to be suitable or incur additional costs for waders using them.

5.1.199 Studies at major construction sites within estuaries has been demonstrated to lead to reduced densities of wintering waders and wildfowl (teal, oystercatcher, curlew and redshank) at Cardiff Bay (Burton *et al.,* 2002). Noise is often a significant source of construction-related disturbance, particularly where activities such as piling are undertaken. Most studies have found that irregular and loud sounds cause the greatest disturbance, although the disturbance effect may be reduced if relatively quieter sounds occur ahead of the louder sounds. Kusters *et al.* (1998) found that the strength of reaction to noise and other disturbance was greater when large numbers of birds are closely aggregated (such as roosting birds).

5.1.200 Furness *et al.* (2013) ranked the sensitivity of seabirds to the effects of disturbance related to offshore wind development. The sensitivity ranking was based on combined scores for sensitivity to disturbance, habitat flexibility and conservation importance. Divers were the most sensitive of all seabirds assessed, closely followed by scoters, eider and Slavonian grebes. Divers in particular showed a strong escape response and large escape distance when approached, combined with a strong reliance on specific habitat features when foraging (sheltered shallow water over soft substrates). Therefore, disturbance to these species may cause significant energetic and reduced foraging costs.

5.1.201 On the basis of the research discussed above, the IOFs using the Site were scored as high sensitivity to the effects of disturbance during construction at roosting or foraging locations, with the exception of oystercatcher, which was scored as medium.

5.1.202 Despite medium to high sensitivities to disturbance, the impact of disturbance caused by construction activities is predicted to be of local spatial extent, short term duration, and reversible. In addition, there is suitable alternative roost and foraging locations within a short distance of the location of proposed construction activity. Thus the predicted magnitude of change for all species is predicted as negligible or low.

5.1.203 The impact matrix for the IOFs assessed is presented in Table 5.17.

Table 5.17: Impact assessment for construction effects on IOFs

Species	Effect	Sensitivity to effect	Receptor sensitivity	Magnitude of change	Impact	Significance of Impact
Bar-tailed godwit	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Curlew	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Dunlin	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Greenshank	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Lapwing	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant

Species	Effect	Sensitivity to effect	Receptor sensitivity	Magnitude of change	Impact	Significance of Impact
Oystercatcher	Disturbance at foraging and roosting locations; short duration	Medium	Medium	Negligible / Low	Minor (adverse)	Not significant
Redshank	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Shelduck	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant
Wigeon	Disturbance at foraging and roosting locations; short duration	High	High	Negligible / Low	Minor or moderate (adverse)	Not significant

5.1.204 Therefore, the effects will be between **minor** or **moderate adverse**; however, due to the relatively low abundance of IOFs in the inter-tidal and nearshore area, and based on the previously reported conservation status and recoverability levels for each species, in combination with vulnerability, it is unlikely that the effects would be beyond **minor adverse**, which is not significant in EIA terms.

Further Mitigation

5.1.205 The only effect predicted to have a minor or moderate adverse (though not significant) impact is disturbance during construction. The greatest magnitude of change is anticipated for waterfowl and waders foraging in near shore waters and for roosting aggregations of these species at high tide. Therefore, the following mitigation describes methods that will reduce disturbance for these IOFs

5.1.206 Noise from construction activities has been identified as a significant source of disturbance for roosting (and breeding) birds. Methods to attenuate noise from piling will be utilised, notably the use of sound walls, perimeter site hoardings and any modification of drilling rigs that would reduce noise levels. Drilling works will be supervised by a suitably qualified and experienced ECoW to determine if additional measures may be required. Birds also are more sensitive to disturbance from people out in the open, rather than machinery or vehicle movements. Appropriate screening will be therefore put in place and Toolbox talks provided to site staff to minimise people movements in lines of sight of aggregations of these species, as advised by the ECoW.

5.1.207 Where further mitigation is required during construction of the development relevant documents will be reviewed and updated to ensure appropriate protection is afforded to IOFs.

Future Monitoring

5.1.208 Where further mitigation is required during construction of the development in the judgement of the ECoW, relevant documents will be reviewed and updated to ensure appropriate protection is afforded to IOFs. This will include updating the requirement for monitoring where any additional impacts are identified.

Accidents and/or Disasters

5.1.209 During the construction phase fuel and/or oil leaks from plant and machinery could cause a potential pollution incident. The mitigation as proposed in paragraph 5.1.86 *et. seq*. would minimise the risk to ecologically sensitive areas.

5.1.210 Documentation will be reviewed and updated throughout the construction phase if further effects or mitigation are identified.

Assessment of Operational Effects

Designated Sites

5.1.211 Effects on notified features of the Southannon Sands SSSI are covered in Part 1 of this chapter.

Ornithology

5.1.212 During the operational phase of the Project, there is the potential for disturbance to breeding and wintering birds through human presence on the site and during maintenance activities. It is likely that birds during the site will have become habituated to any disturbance (e.g. noise/visual/vibrations) as a result of the construction phase and therefore no additional impacts above those assessed for the construction stage are considered likely.

5.1.213 The permanent above ground structures (external plant and cable extrusion tower) are to be sited on an area of semi-improved grassland and bare ground, with the majority of the raised conveyor sited along the pier.

5.1.214 The extrusion tower will be approximately 185m tall and would take approximately 43 weeks to complete alongside the factory phase of construction. Artificial light is known to have many effects on birds which may be positive (increased opportunity for activity that would normally only occur during daylight); and negative effects, including attraction to lights (phototaxis), disruption of photoperiodicity and increased opportunities for visually active predators.

5.1.215 Therefore, external lighting of the extrusion tower (i.e. during night-time or poor light conditions) could lead to disturbance effects on certain species, derived from changes in orientation, disorientation and attraction or repulsion from the altered light environment, which may, in turn affect foraging, migration or communication. The use of appropriate mitigation, such as directional lighting, shielding light sources and reducing the intensity of lights, will aid in minimising the risks of birds being impacted upon, however further consideration will need to be given to the number and positioning of external light sources as part of the Project design.

5.1.216 The magnitude of the impact has been assessed as low and the conservation value of the receptor would be high sensitivity, leading to a **minor** to **moderate adverse** significance. Through the use of appropriate mitigation and following the external lighting scheme design for the Project, it is considered that the impacts on local bird populations would not extend beyond **minor adverse**.

Further Mitigation

5.1.217 No further mitigation is anticipated to be required for the operational phase of the Project. Documentation will be reviewed and updated throughout the construction phase if further effects or mitigation are identified.

Future Monitoring

5.1.218 No further monitoring is anticipated to be required following the completion of the construction phase. Documentation will be reviewed and updated throughout the construction phase if further effects or monitoring are identified.

Accidents/Disasters

5.1.219 During the operational phase fuel and/or oil leaks from plant and machinery could cause a potential pollution incident. The mitigation as set out above would minimise the risk to ecologically sensitive areas.

5.1.220 Documentation will be reviewed and updated throughout the construction phase if further potential risks are identified.

Assessment of Cumulative Effects

5.1.221 The following section describes the potential in-combination effects relevant to populations of IOF using the Site of the Project.

5.1.222 Cumulative effects refer to effects upon avian receptors arising from the Project when considered alongside other proposed developments and activities. Proposed developments within 10km of the site that have comparable effects and which therefore lead to additive effects on the IOF assessed here are listed in Table 5.18 below.

Table 5.18: List of Other Proposed Developments for Cumulative Assessment

Application Number	Status	Description	Distance from Project site (km)
21/01044/EIA	Scoping Agreed	EIA screening request for proposed synchronous condenser plant	0
21/01135/PPM	Pending Consideration	Installation of synchronous compensator and cable route with associated infrastructure	0.39
21/00480/EIA	Scoping Agreed	EIA screening request for proposed synchronous compensator	0.40
20/00942/PP	Approved subject to Conditions	Installation of a synchronous compensator and ancillary infrastructure	0.46
20/00652/EIA	Scoping Agreed	Request for a screening opinion for installation of a synchronous compensator and ancillary infrastructure	0.51
21/00109/EIA	Pending Consideration	Request for EIA Screening Opinion in relation to the replacement and enlargement of existing jetty at Hunterston Marine Yard.	0.63
21/00107/EIA	Pending Consideration	Request for EIA screening opinion for the renewal of planning permission 18/00132/PP for the erection of Caisson gates and removal of existing bund	0.75
21/00622/EIA	Scoping Agreed	EIA Screening Request for a proposed 49.9MW cryogenic energy storage facility | Hunterston Construction Yard Fairlie Largs Ayrshire.	0.85
19/00506/PP	Approved subject to Conditions	Application to vary Planning Condition number 4 of 18/00659/PP, to provide temporary shared-use path adjacent to plots 38, 39 & 46, in lieu of the permanent path proposed adjacent to plots 35, 36 & 37. Amendment to planning permission 17/00584/PPM for substitution of house types, providing an additional 2 dwelling houses overall, including the introduction of 1 no new house type (Residential development comprising 95 dwelling houses, formation of open space and associated infrastructure works)	1.20
20/00485/LUP	Certificate Issued	Demolition of existing structures and minor earth works at Hunterston B Nuclear Power Station	1.65
ECU00002104	Screening Complete	Energy Storage including battery storage at Campbelton Farm, Beech Avenue, Hunterston	1.78
ECU00003319	Consented	Hunterston Grid Services Complex: Installation and operating of a group of grid services facilities including the storage and management of energy and associated infrastructure.	1.78

21/00159/PP	Approved	Erection of 132kV substation, including detailed siting, design, external appearance, landscaping and means of access	1.80
17/00740/PP	Approved subject to Conditions	Proposed replacement weather envelope cladding to reactor buildings and associated works (revised design to cladding approved under planning permission ref. N/01/00286/PP)	2.20
20/00427/LUP	Certificate Issued	Erection of 18 dwelling houses and associated roads, landscaping and parking	2.90
21/00247/PP	Approved subject to Conditions	Erection of 30 dwelling flats with associated access and landscaping	3.90
19/00852/ALO	Approved	Removal of Section 75 obligation attached to planning permission 15/00098/PP for erection of 16 no flats including demolition of existing care home building	4.00
20/00222/PP	Approved subject to Conditions	Application to vary planning permission in principle 18/00393/PPPM to remove condition 7. Planning permission in principle for residential development	4.80

5.1.223 Anticipating that Hunterston PARC continues to be developed, it is possible these would run concurrently with the XLCC Hunterston development. With successful mitigation and monitoring, it is expected that any cumulative effects would be from the construction rather than the operation phase of the development.

Summary of Effects

5.1.224 This chapter has presented the results of the EIA for the potential impacts of the Project on key bird interests, covering all impacts during the construction and operation phases. The effects arising from the decommissioning phase are predicted to be similar in extent and duration as construction and have therefore not been included in this assessment.

5.1.225 Information on birds within the Project area was collected through a detailed desktop review of existing datasets and studies, Scottish and UK statutory guidance, analysis of data collected during the site-specific surveys and consultation with statutory conservation stakeholders.

5.1.226 The baseline surveys of the ornithological interests of the site and Project area were undertaken between September and December 2021.

5.1.227 There were no sites designated for their ornithological interests with connectivity to the Site within 20km. However, a number of species were present in either regionally important numbers, internationally important numbers or species of international importance in Scotland (as defined by the Scottish Biodiversity List). These populations comprised sensitive Important Ornithological Features (IOF) for which an assessment of potential effects has been undertaken.

5.1.228 The species assessed to be using the Site were:

- Waders: bar-tailed godwit, curlew, dunlin, greenshank, lapwing, oystercatcher, redshank; and
- Waterfowl: shelduck and wigeon.

5.1.229 The only predicted effect on sensitive IOF is disturbance during construction. Species regarded as particularly sensitive to disturbance are waders and waterfowl at high-tide roosts and foraging areas.

5.1.230 Disturbance as a result of construction or decommissioning activities was considered for waders and waterfowl at high-tide roosts and foraging areas. Due to the localised and temporary nature of the activities and the small number of birds affected as a result, these were all considered to be of low to negligible impacts of **minor to moderate adverse** significance. However, due to the relatively low abundance of IOFs in the inter-tidal and nearshore area, and based on the previously reported conservation status and recoverability levels for each species, in combination

with vulnerability it is unlikely that the effects would be beyond **minor adverse**, which is not significant in EIA terms.

5.1.231 Following the successful design and implementation of mitigation measures, it is anticipated that the majority of operational effects on sensitive IOF will be **negligible** and not significant in EIA terms.

5.1.232 The extrusion tower has the potential to significantly impact on bird species present within the local area derived from changes in orientation, disorientation and attraction or repulsion from the altered light environment, which may, in turn affect foraging, migration or communication. Following the use of appropriate mitigation such as directional lighting, shielding light sources, reducing the intensity of lights and following the external lighting scheme design for the Project, it is considered that the impacts on local bird populations would not extend beyond **minor adverse**, which is not significant in EIA terms.

5.1.233 An assessment of cumulative impacts on ornithology from the Project together with other developments within approximately 10km were assessed, which were predicted to be non-significant in EIA terms, following successful implementation of mitigation, specifically when considering traffic management and road use. However, documentation will be reviewed and updated throughout the construction phase if further potential risks are identified.

Table 5.19: Summary of Likely Environmental Effects on Ornithology

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Construction phase							
Designated sites (Southannan Sands SSSI)	High	Temporary direct impact from pollution	Short term	Low	Minor (adverse)	Not significant	None
Bar-tailed godwit	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Curlew	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Dunlin	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Greenshank	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Lapwing	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Oystercatcher	Medium	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Redshank	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
Shelduck	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Wigeon	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Operational phase							
Designated sites (Southannan Sands SSSI)	High	Temporary direct impact from pollution	Short term	Negligible / Low	Minor (adverse)	Not Significant	None
Breeding and wintering birds	High	Localised disturbance from external lighting on extrusion tower	Long-term	Low	Minor (adverse)	Not Significant	None
Bar-tailed godwit	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Curlew	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Dunlin	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Greenshank	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Lapwing	High	Temporary disturbance at	Short term	Negligible / Low	Minor (adverse)	Not significant	None

Receptor	Sensitivity of receptor	Description of impact	Short / medium / long term	Magnitude of impact	Significance of effect	Significant / Not significant	Notes
		foraging and roosting locations					
Oystercatcher	Medium	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Redshank	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Shelduck	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None
Wigeon	High	Temporary disturbance at foraging and roosting locations	Short term	Negligible / Low	Minor (adverse)	Not significant	None

References

Burns, F., Eaton, M.A., Balmer, D.E., Banks, A., Caldrow, R., Donelan, J.L., Douse, A., Duigan, C., Foster, T., Grice, P.V., Hall, C., Hanmer, H.J., Harris, S.J., Johnstone, I., Lindley, P., McCullock, N., Noble, D.G., Risely, K., Robinson, R.A. and Wotton, S. (2020) The State of the UK's Birds. The RSPB, BTO, WWT, DAERA, JNCC, NatureScot, NE and NRW, Sandy, Bedfordshire.

Burton, N.H.K., Armitage, M.J.S., Musgrove, A.J. and Rehfisch, M.M. (2002). Impacts of manmade landscape features on numbers of estuarine waterbirds at low tide. Environmental Assessment, 30, 857–864

Catry, T., Alves, J.A., Andrade, J., Costa, H., Dias, M.P., Fernandes, P., Leal, A., Lourenco, P.M., Martins, R.C., Muniz, F., Pardal, S., Rocha, A., Santos, C.D., Encarnacao, V. and Granadeiro, J.P. (2011). Long-term declines of wader populations at the Tagus estuary, Portugal: a response to global or local factors? Bird Conservation International, 21, 438–453

CIBSE (2018) Society of Light and Lighting, Lighting Handbook.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland.

Department for Environment, Food and Rural Affairs (Defra)(2001). European Community Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora. First report by the United Kingdom under Article 17 on implementation of the Directive from June 1994 to December 2000. Defra Bristol.

European Commission (1985). Directive 85/337/EEC of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment.

European Commission (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

Frost, T., Austin, G., Hearn, R., McAvoy, S., Robinson, A., Stroud, D., Woodward, I. and Wotton, S. (2019) Population Estimates of Wintering Waterbirds in Great Britain. British Birds 112. 130-145.

Furness, B. and Wade, H. (2013). Vulnerability of Scottish Seabirds to Offshore Wind Turbines. J.Environ. Manag. 119, 56-66.

Furness, R.W. (2015). Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.

Gilbert, G., Gibbons, D.W. and Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy

Kirby, J.S., Clee, C. and Seager, V. (1993). Impact and extent of recreational disturbance to wader roosts on the Dee Estuary: Some preliminary results. Wader Study Group Bulletin, 68, 53–58.

Kusters, E. and van Raden, H. (1998). On the influence of military shooting ranges on the birds of the Wadden Sea. Zeitschrift fur Jagdwissenschaft, 44, 221–236

Legislation.gov.uk. Wildlife and Countryside Act 1981. [online] Available at: http://www.legislation.gov.uk/ukpga/1981/69/contents [Accessed: 20 January 2022].

Legislation.gov.uk. The Conservation of Habitats and Species Regulations 2019 (EU Exit Amendment) [online] Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents [Accessed: 20 January 2022]

Legislation.gov.uk. The Nature Conservation (Scotland) Act 2004 (as amended) [online] Available at: https://www.legislation.gov.uk/asp/2004/6/contents [Accessed 20 January 2022].

Legislation.gov.uk. The Wildlife and Natural Environment (Scotland) Act 2011 [online] Available at: https://www.legislation.gov.uk/asp/2011/6/contents/enacted [Accessed 20 January 2022].

MAGIC. (2021). Statutory Designated Site and Ordnance Survey map information. Available from www.magic.gov.uk [Accessed: 20 January 2022].

Met Office 2018 UK Climate Projections 2018.

Musgrove A., Langston, R., Baker, H. and Ward, R. (2003). Estuarine Waterbirds at Low Tide: The WeBS Low Tide Counts 1992–93 to 1988–99. WSG/BTO/WWT/RSPB/JNCC, Thetford.

NatureScot Sitelink. Available at http://gateway.snh.gov.uk/sitelink/index.jsp [Accessed 20 January 2022].

North Ayrshire Council (2019): Adopted Local Development Plan: Your Plan Your Future.

Scottish Government (2014a) Ambition Opportunity Place: Scotland's Third National Planning Framework.

Scottish Government (2014b) Scottish Planning Policy.

Stansbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021). Birds of Conservation Concern (BoCC) 5: the status of our bird populations the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114. 723-747

UK BAP, (2010). UK Biodiversity Action Plan. UK BAP. Available from: www.jncc.defra.gov.uk [Accessed: 20 January 2022].

Urfi, A.J., Goss-Custard, J.D. and Durell, S.E.A. le V. (1996). The ability of oystercatchers Haematopus ostralegus to compensate for lost feeding time: Field studies on individually marked birds. Journal of Applied Ecology, 33, 873–883.