

MONA OFFSHORE WIND PROJECT

Preliminary Environmental Information Report

Volume 3, chapter 24: Onshore and intertidal ornithology



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FINAL

Image of an offshore wind farm

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Glossary

Term	Meaning
Autumn passage	The period when migratory species are returning to their wintering grounds. It is defined as the August to October inclusive period by Stroud <i>et al.</i> (2016).
Birds of Conservation Concern	A list of species whose UK populations are endangered or in decline, or internationally sensitive species.
Breeding season	The duration and timing of the breeding season varies according to species (Douse, 2014), but the breeding season is generally taken as March – July inclusive.
British Trust for Ornithology	A non-statutory ornithological research organisation.
Cofnod	North Wales Environmental Information Service.
Foraging	The time when birds are actively looking for food.
Joint Nature Conservation Committee	A statutory body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
Intertidal ornithology study area	The Mona Proposed Landfall plus a 500m disturbance buffer where site-specific surveys were undertaken.
Non-breeding season	Taken as the wintering season plus the spring and autumn passage period as recognised by Stroud <i>et al.</i> (2016).
Non-Estuarine Waterbird Survey	A BTO led waterbird survey of non-estuarine stretches of coastline.
Peak	The maximum number of birds noted at one time. All figures quoted for birds relate to individuals unless noted otherwise.
Roosting	The time when birds are resting.
Sites of Special Scientific Interest	An area protected under law for its nationally important biological or geological features.
Special Protection Area (SPA)	An area protected under law for its internationally or nationally important numbers of migratory bird species.
Spring passage	The period when migratory species are returning to their breeding grounds. It is defined as the April to June inclusive period by Stroud <i>et al.</i> (2016).
Territory analysis	A method of recognising probable breeding attempt by a bird using the territorial registrations noted down during survey.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Wetland Bird Survey	A monitoring programme of waterbirds in the UK organised by the BTO and run since 1965. The Wetland Bird Survey, or WeBS, is widely recognised as the most accurate national assessment of waterbird numbers.
Wildlife and Countryside Act 1981, (as amended)	UK legislation which sets out protections for species and habitats.
Wintering season	The period when birds are present on their wintering grounds. The period is defined as November to March inclusive by Stroud <i>et al.</i> (2016).

Acronyms

Acronym	Description
AON	Apparently Occupied Nest
BBS	Breeding Bird Surveys
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CBC	Common Bird Census
CCS	Current Conservation Status
CEA	Cumulative Effect Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
DCO	Development Consent Order
EC	European Council
ECoW	Ecological Clerk of Works
EWG	Expert Working Group
FCS	Favourable Conservation Status
HDD	Horizontal Directional Drilling
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitat Regulations Assessment
INNS	Invasive and Non-Native Species
ISAA	Information to Support Appropriate Assessment
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LERC	Local Environmental Records Centre
MAGIC	Multi Agency Geographic Information for the Countryside
MDS	Maximum Design Scenario
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
NEWS	Non-Estuarine Waterbird Survey
NGET	National Grid Electricity Transmission
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Projects
PEIR	Preliminary Environmental Information Report
PPW	Planning Policy Wales

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Acronym	Description
PRoW	Public Rights of Way
pSPA	potential Special Protection Areas
RSPB	Royal Society for the Protection of Birds
SNCB	Statutory Nature Conservation Bodies
SPA	Special Protection Area
SPL	Sound Pressure Levels
SSSI	Site of Special Scientific Interest
TAN	Technical Advice Note
VOR	Valued Ornithological Receptor
WCA	Wildlife and Countryside Act
WeBS	Wetland Bird Survey
WOS	Welsh Ornithological Society
ZOI	Zone of Influence

Units

Unit	Description
%	Percentage
km ²	Square kilometres
km	Kilometres
m ²	Metres square
ha	Hectares
m	Metre
kV	Kilovolts

24 Onshore and intertidal ornithology

24.1 Introduction

24.1.1 Overview

24.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the assessment of the potential impact of the Mona Offshore Wind Project on onshore and intertidal ornithology. Specifically, this chapter considers the potential impact of the Mona Offshore Wind Project landward of Mean Low Water Springs (MLWS) during the construction, operations and maintenance and decommissioning phases. Those impacts of the Mona Offshore Wind Project seaward of MLWS are addressed in volume 2, chapter 10: Offshore ornithology of the PEIR.

24.1.1.2 The assessment presented is informed by the following technical chapters:

- Volume 7, annex 24.2: Intertidal Ornithology technical report.
- Volume 7, annex 24.3: Onshore Ornithology - Breeding Birds technical report.

24.1.1.3 The final Environmental Statement will also include an assessment of the potential impacts on wintering and migratory birds. Surveys of wintering and migratory birds have not yet been fully undertaken or analysed at this stage of the assessment. However an initial desktop study of potential wintering and migratory receptors is presented in:

- Volume 7, annex 24.1: Onshore Ornithology - Wintering and Migratory Birds technical report.

24.1.1.4 In addition, this chapter draws upon information contained within volume 1, chapter 2: Policy and legislation; volume 1, chapter 5: Environmental Impact Assessment methodology and volume 2, chapter 10: Offshore ornithology of the PEIR.

24.1.1.5 The primary purpose of the PEIR is outlined in volume 1, chapter 1: Introduction of the PEIR. In summary, the primary purpose of an Environmental Statement is to support the Development Consent Order (DCO) application for Mona Offshore Wind Project under the Planning Act 2008 (the 2008 Act). The PEIR constitutes the Preliminary Environmental Information for Mona Offshore Wind Project and sets out the findings of the EIA to date to support the pre-application consultation activities required under the 2008 Act. The EIA will be finalised following completion of pre-application consultation and the Environmental Statement will accompany the application to the Secretary of State for Development Consent.

24.1.1.6 The PEIR forms the basis for statutory consultation which will last for 47 days and conclude on 4 June 2023 as set out in volume 1, chapter 2: Policy and legislation of the PEIR. At this point, comments received on the PEIR will be reviewed and incorporated (where appropriate) into the Environmental Statement, which will be submitted in support of the application for Development Consent scheduled for quarter one of 2024.

24.1.1.7 In particular, this PEIR chapter:

- Presents the existing environmental baseline established from desk studies, site-specific surveys and consultation.

- Identifies any assumptions and limitations encountered in compiling the environmental information.
- Presents the potential environmental effects on onshore and intertidal ornithology arising from the Mona Offshore Wind Project, based on the information gathered and the analysis and assessments undertaken
- Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce, or offset the possible environmental effects of the Mona Offshore Wind Project on onshore and intertidal ornithology.

24.1.2 Study areas

24.1.2.1 The onshore ornithology assessment is divided into three parts: Mona Intertidal Ornithology, Mona Onshore Ornithology Breeding Birds, and Mona Onshore Ornithology Wintering and Migratory Birds. The areas covered by the Mona Onshore Ornithology Breeding Birds and the Mona Onshore Ornithology Wintering and Migratory Birds are identical in extent and thus referred to collectively as the onshore ornithology study area hereafter.

- The intertidal ornithology study area (Figure 24.1) comprises the Mona Proposed Onshore Development Area at landfall plus a 500 metre (m) buffer extending west along the coast. The intertidal ornithology study area extends offshore from the Mean High Water Springs (MHWS) and consists of the intertidal zone (which features sandflats and shingles), and the nearshore marine waters. The extent of the intertidal ornithology study area was modified in September 2022 as a result of the changes to the location and width of the Offshore Cable Corridor location and thus the Mona Landfall.
- The onshore ornithology study area (Figure 24.2) comprises the Mona Proposed Onshore Development Area plus a 250m buffer. This 250m buffer is based on potential disturbance distances for species potentially present during the surveys (Hötter *et al.*, 2006; Cutts *et al.*, 2013; Goodship & Furness., 2022). The 250m buffer was used as the survey boundary for both the breeding bird surveys, and the onshore wintering and migratory bird surveys.

24.1.2.2 The intertidal ornithology study area is used to record both nearshore seabirds and intertidal waterbirds. For the purposes of this assessment nearshore seabirds and intertidal waterbirds are assessed separately since the species from each guild (seabirds and waterbirds) are discretely different with seabirds exploiting resources in nearshore water habitats and waterbirds exploiting resources in the intertidal area and habitat.

24.1.2.3 As defined by the Ramsar Convention on Wetlands (1971): waterbirds include geese, swans, ducks, rails, cranes, grebes, waders, divers, cormorants, spoonbills, herons, gulls, terns, and kingfishers (Ramsar, 1971).

24.1.2.4 The overarching term 'seabird' is used to refer to species that depend on the marine environment for survival at some point in their life cycle. Therefore, in addition to the true seabirds, seaducks, divers and grebes are included because of their additional reliance on marine areas, especially in the non-breeding season.

24.1.2.5 The onshore ornithology study area is used to record both breeding birds, and wintering and migratory birds. For the purposes of this assessment these species will be assessed separately and according to their seasonality (e.g. breeding, and

non-breeding), their habitat requirements, and their conservation status (which may differ between seasons). Wintering and migratory birds (e.g. passerines and birds of prey) present along the onshore ornithology study area have not been assessed in this PEIR but will be assessed in the Environmental Statement.

- 24.1.2.6 The onshore ornithology study area falls within both Conwy County Borough Council and Denbighshire County Council. The route starts at MHWS on the intertidal zone at the Mona Landfall, and winds up through limestone hills. It is dominated by improved grassland used for sheep grazing and for intensive arable farming. Within this ornithologically impoverished landscape there are small blocks of woodland, scrub and field boundaries comprised of hedgerows of various habitat quality. Small areas of coastal habitats are present at the coast. Within this matrix there are also watercourses and built-up areas.



Figure 24.1: Intertidal ornithology study area.



Figure 24.2: Onshore ornithology study area.

24.2 Policy context

24.2.1 National Policy Statements

- 24.2.1.1 Planning policy on renewable energy infrastructure is presented in volume 1, chapter 2: Policy and legislation of the PEIR. Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to onshore ornithology, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1; DECC, 2011a), the NPS for Renewable Energy Infrastructure (EN-3, DECC, 2011b) and the NPS for Electricity Networks Infrastructure (EN-5, DECC, 2011c).
- 24.2.1.2 NPS EN-1 and NPS EN-3 include guidance on what matters are to be considered in the assessment. These are summarised in Table 24.1 below. NPS EN-1 and NPS EN-3 also highlight a number of factors relating to the determination of an application and in relation to mitigation (further information provided in Table 24.2).
- 24.2.1.3 NPS-5 includes guidance on what matters are to be considered in the onshore assessment of electrical networks. These are summarised in Table 24.1 below. NPS EN-5 also highlights a number of factors relating to the determination of an application and in relation to mitigation (further information provided in Table 24.3 below).
- 24.2.1.4 Table 24.1 refers to the current NPSs, specifically NPS EN-1 (DECC, 2011a) and NPS EN-3 (DECC, 2011b). If the NPSs are updated prior to the application for Development Consent, the revised NPSs will be fully considered in relation to onshore and intertidal ornithology within the Environmental Statement.

Table 24.1: Summary of the NPS EN-1 and NPS EN-3 provisions relevant to onshore ornithology.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the PEIR
NPS EN-1	
Where the proposal is subject to EIA, the applicant should ensure that the Environmental Statement clearly sets out any effects on the environment, including specific fauna. An assessment is required of any likely significant effects of the proposal on the environment be they direct, indirect, secondary, cumulative, short, medium, long-term, permanent, temporary, positive, or negative at all stages of the project. Methods for avoiding or mitigating adverse effects should be included (NPS EN1, paragraph 4.2.1).	Assessment of the potential effects of the Mona Offshore Wind Project are considered in section 24.7 of this chapter. Tertiary mitigation is discussed in section 24.6 of this chapter.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the PEIR
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Where the development is subject to EIA the applicant should ensure that the Environmental Statement clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (NPS EN-1, paragraph 5.3.3).	The process of identifying designated sites has been undertaken in section 24.4.3 of this chapter. The baseline ornithological environment is described in section 24.4 of this chapter. Assessment of the potential effects of the Mona Offshore Wind Project for specific species are identified and considered in section 24.7 of this chapter. Important areas for onshore ornithology are considered in: volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR.
The important sites for biodiversity are those identified through international conventions and European Directives that the Habitats Regulations provide protection for potential Special Protection Areas (pSPAs) and listed RAMSAR sites should be afforded the same protections within development proposals (NPS EN-1, paragraph 5.3.9).	Internationally designated ornithological sites are considered in: volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR.
All Sites of Specific Scientific Interest (SSSIs) should be protected as if designated as sites of international importance, including those features of SSSIs not covered by international designation (NPS EN-1 paragraph, 5.3.10).	Important areas for onshore ornithology are considered in: volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR.
Many species and habitats have been identified as being of principal importance to biodiversity in addition to wildlife species that receive statutory protection under a range of legislative provisions. These species and habitats require conservation action (NPS EN-1 paragraph, 5.3.17).	Assessment of the potential effects of the Mona Offshore Wind Project and tertiary mitigation measures are identified and considered in section 24.7 and 24.6 of this chapter respectively. In addition, all species afforded extra protections under the Conservation of Habitats and Species Act 2017 (as amended) (formerly the EU Birds Directive Annex I), Schedule 1 of the Wildlife and Countryside Act, and Section 7 species of the Environment (Wales) Act 2016, are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: onshore ornithology breeding birds technical report of the PEIR.
NPS EN-3	
Where the applicant has identified a precise route for the cable to a precise location for the Mona Onshore Substation and connection to the transmission network, the EIA should assess the effects of the cable (NPS EN-3, paragraph 2.6.37).	The maximum impacts of the cable during construction, operation, and decommissioning are discussed in section 24.5.4. and Section 7 species of the Environment (Wales) Act 2016, are considered in: volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. Section 7 species are also considered in the assessment in section 24.7 of this chapter.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the PEIR
Consultation on the assessment methodologies should be undertaken at early stages with the statutory consultees as appropriate (NPS EN-3, paragraph 2.6.65).	Throughout the Mona Offshore Wind Project consultations with relevant statutory and non-statutory stakeholders have been carried out (e.g. via the Evidence Plan Process Expert Working Groups (EWG)) and are presented in section 0.
There is the potential to impact on birds through: <ul style="list-style-type: none"> • Direct habitat loss • Disturbance from construction activities • Displacement during the operations phase, resulting in loss of foraging/roosting area • Impacts on bird flight lines (i.e. barrier effect) and associated increased energy use by birds for commuting flights between roosting and foraging areas. (NPS EN-3, paragraph 2.6.101)	Assessment of the potential effects of the Mona Proposed Onshore Development Area for Valued Ornithological Receptors (VORs) are identified and discussed in section 24.7.
The scope, effort and methods required for ornithological surveys should have been discussed with the relevant statutory advisor (NPS EN-3, paragraph 2.6.102).	Baseline survey methods have been discussed with Natural Resources Wales (NRW) and the Royal Society for the Protection of Birds (RSPB) through the Evidence Plan Process

Table 24.2: Summary of NPS EN-1 and NPS EN-3 policy on decision making relevant to onshore ornithology.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the PEIR
NPS EN-1	
The aim of the NPS is to ensure a halting, and if possible, a reversal, of declines in priority habitats and species, with wild species and habitats as part of healthy, functioning ecosystems (NPS EN-1, paragraph 5.3.5).	Assessment of the potential effects of the Mona Offshore Wind Project and associated mitigation for specific species are identified and discussed in sections 24.7 and 24.6 respectively.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the PEIR
“The Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment” (NPS EN-1, paragraph 5.3.8).	Internationally, nationally, and locally important ornithological sites are considered in volume 7, annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: onshore ornithology breeding birds technical report of the PEIR. This process of identifying designated ornithological sites of international, national, and local importance has been considered in section 24.4.3 of this chapter. In addition, all species afforded extra protections under the Conservation of Habitats and Species Act 2017 (as amended) (formerly the EU Birds Directive Annex I), Schedule 1 of the Wildlife and Countryside Act, and Section 7 species of the Environment (Wales) Act 2016, are considered in: volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: onshore ornithology breeding birds technical report of the PEIR. This has been taken into consideration in the assessment in section 24.7.
The Secretary of State should use requirements alongside planning obligations to mitigate the impacts of the development and to enhance/conserves biodiversity where possible (NPS EN-1, paragraph 5.3.11).	Assessment of the potential effects of the Mona Offshore Wind Project and tertiary mitigation measures are identified and discussed in sections 24.7 and 24.6 of this chapter respectively.
The Secretary of State should give substantial weight to any harm to biodiversity of national or regional importance where it considers it may arise from the proposed development (NPS EN-1, paragraph 5.3.17).	Nationally important sites are considered in 24.4.3, and Section 7 species of the Environment (Wales) Act 2016 are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. Section 7 species are also considered in the assessment in section 24.7 of this chapter.
The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and NRW and whether NRW have granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences (NPS EN-1, paragraph 5.3.20).	Tertiary mitigation measures for onshore ornithology have been considered in section 24.6 of this chapter.

Table 24.3: Summary of NPS EN-5 policy on decision making relevant to onshore ornithology.

Summary of NPS EN-5 provision	How and where considered in the PEIR
The Secretary of State should ensure that biodiversity has been considered in the Environmental Statement and that appropriate mitigation measures will be taken where necessary (NPS EN-5, paragraph 2.7.3).	Assessment of the potential effects of the Mona Offshore Wind Project are considered in section 24.7 and tertiary mitigation measures are identified in sections 24.6.

24.2.2 Planning Policies for Wales

24.2.2.1 The assessment of potential changes to onshore ornithology has also been made with consideration to the specific policies set out in Planning Policy Wales (PPW) (Welsh Government, 2021a). Key provisions are set out in Table 24.4 along with details as to how these have been addressed within the assessment.

Table 24.4: Summary of Planning Policy Wales relevant to onshore ornithology.

Summary of PPW	How and where considered in the PEIR
Development proposals must consider how they will: support the conservation of biodiversity; ensure action in Wales contributes to international responsibilities towards biodiversity and habitats; ensure statutorily and non-statutorily designated sites are protected; safeguard from direct impacts on protected and priority species and the ecological networks and components that underpin them; secure enhancement of and improvements to ecosystem resilience (PPW, paragraph 6.4.3).	Internationally, nationally, and locally important ornithological sites are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. This process of identifying designated ornithological sites of international, national, and local importance has been considered in section 24.4.3. In addition all species afforded extra protections under the Conservation of Habitats and Species Act 2017 (as amended) (formerly the EU Birds Directive Annex I), Schedule 1 of the Wildlife and Countryside Act, and Section 7 species of the Environment (Wales) Act 2016, are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. This has been taken into consideration in the assessment in section 24.7.
Development should not cause any significant loss of habitats or populations locally or nationally and must provide a net benefit for biodiversity (PPW, paragraph 6.4.5).	An assessment of the significance of effects of the proposal alone are presented in section 24.7 An assessment of the cumulative effects of the proposal are conducted in section 24.8.

Summary of PPW	How and where considered in the PEIR
The presence of a protected species is a material consideration when assessing the impacts of a proposal. An ecological survey to determine the presence of any such species and assess the likely impact of the development may be required to inform decision making (PPW, paragraph 6.4.22).	All species afforded extra protections under the Conservation of Habitats and Species Act 2017 (as amended) (formerly the EU Birds Directive Annex I), Schedule 1 of the Wildlife and Countryside Act, and Section 7 species of the Environment (Wales) Act 2016, are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: onshore ornithology breeding birds technical report of the PEIR. This has been taken into consideration in the assessment in section 24.7.

24.2.3 Local Planning Policies

24.2.3.1 The assessment of potential changes to onshore ornithology has also been made with consideration to the specific policies set out in Conwy Local Development Plan 2007-2022 (Conwy County Borough Council, 2013) and Denbighshire County Council Local Development Plan 2006-2021 (Denbighshire County Council, 2013). Key provisions are set out in Table 24.5 along with details as to how these have been addressed within the assessment.

Table 24.5: Local planning policy relevant to onshore ornithology.

Policy	Key provisions	How and where considered in the PEIR
Conwy Local Development Plan 2007-2022		
NTE/3 - Biodiversity	New development should aim to conserve and, where possible, enhance biodiversity. All proposals should include a Biodiversity Statement detailing the extent of any impact on biodiversity. The Council will refuse proposals which do not adequately mitigate and remediate impacts on, and include enhancement measures for, protected sites and protected or priority species or habitats. Proposals for these measures should be secured by planning conditions and obligations.	The ornithological baseline has been established (section 24.4.2) through desk top studies and by site specific surveys. Tertiary mitigation measures are set out in section 24.6.
The Denbighshire County Council Local Development Plan 2006-2021		
VOE 5	Development proposals that may have an impact on protected species or designated sites of nature conservation will be required to be supported by a biodiversity statement which must have regard to the County biodiversity aspiration for conservation, enhancement, and restoration. Where the overall benefits of a development outweigh the conservation interest of a locally	Internationally, nationally, and locally important ornithological sites are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. This process of identifying designated ornithological sites of international, national, and local importance has been considered (section 24.4.3). In addition all species afforded extra protections

Policy	Key provisions	How and where considered in the PEIR
	<p>protected nature site, mitigation, and enhancement measures in or adjacent to these sites should be an integral part of the scheme. Where necessary, these measures should be in place prior to the commencement of development.</p> <p>Planning permission will not be granted for development proposals that are likely to cause significant harm to the qualifying features of internationally and nationally designated sites of nature conservation, priority habitats, priority species, or to species that are under threat.</p>	<p>under the Conservation of Habitats and Species Act 2017 (as amended) (formerly the EU Birds Directive Annex I), Schedule 1 of the Wildlife and Countryside Act, and Section 7 species of the Environment (Wales) Act 2016, are considered in volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: onshore ornithology breeding birds technical report of the PEIR. This has been taken into consideration in the assessment in section 24.7.</p> <p>Tertiary mitigation measures are set out in section 24.6.</p> <p>In accordance with policy VOE 5 of the Adopted Local Development Plan 2006-2021 (Denbighshire County Council, 2013), a Biodiversity Statement will be prepared and submitted in support of the Environmental Statement. The Biodiversity Statement will set out how the Mona Offshore Wind Project would comply with Denbighshire County Council's objectives for conserving, enhancing, and restoring biodiversity.</p>
VOE 10	Development proposals which promote the provision of renewable energy technologies will be supported providing they...demonstrate no unacceptable impact upon the interests of nature conservation, wildlife, natural heritage...	The ornithological baseline has been established (section 24.4.2) through desk top studies and by site specific survey. Tertiary mitigation measures are set out in 24.6 and a thorough assessment of VORs is conducted in section 24.7.

24.3 Consultation

24.3.1.1 A summary of the key issues raised during consultation activities undertaken to date specific to onshore and intertidal ornithology is presented in Table 24.6 below, together with how these issues have been considered in the production of this PEIR chapter. Further detail is presented within volume 7 annex 24.1: Onshore ornithology wintering and migratory birds technical report of the PEIR; volume 7 annex 24.2: Intertidal ornithology technical report of the PEIR; volume 7 annex 24.3: Onshore ornithology breeding birds technical report of the PEIR.

24.3.2 Evidence plan

24.3.2.1 The purpose of the Evidence Plan process is to agree the information the Mona Offshore Wind Project needs to supply to the Secretary of State, as part of the DCO application for Mona Offshore Wind Project, with NRW, Conwy County Council, Denbighshire County Council, the Planning Inspectorate and the RSPB. The Evidence Plan seeks to ensure compliance with the Habitat Regulations Assessment (HRA) and EIA.

Table 24.6: Summary of key consultation issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to intertidal and onshore ornithology.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
August 2021	NRW (email)	<p>A technical note was prepared for NRW (Mona Offshore Wind Ltd, 2021) describing the proposed survey methodology for intertidal and nearshore coastal birds, including a map of the survey area, for review and comment.</p> <p>The proposed methodology included:</p> <ul style="list-style-type: none"> • Desk based assessment of online resources (including a review of available designated sites citations and British Trust for Ornithology (BTO)/Wetland Bird Survey (WeBS) data. • Scoping walkover of each landfall option during August/early September 2021 to identify habitats requiring survey. <p>Monthly intertidal and nearshore coastal bird surveys of the landfall areas and a buffer of at least 500m in either direction along the coast and up to 1.5km from the MHWS mark. It must be noted that at this stage of the Mona Offshore Wind Project multiple landfall options were being considered.</p>	<p>On 02/09/2021 NRW provided the following comments on the methodology via e-mail:</p> <ul style="list-style-type: none"> • NRW advised that at least two contemporary years of core wintering bird surveys were required to account for interannual variation in use by bird features of designated sites. • NRW welcomed the timing of the migratory passage and core wintering surveys being September 2021 to April 2022 inclusive, with the possibility of an extension into May, June, July. • NRW welcomed the proposed 'Through-the-tidal-cycle' survey methodology which provides good coverage across the tidal cycle. <p>NRW recommended contacting BTO for the latest WeBS and Non-Estuarine Waterbird Survey (NEWS) data as well as the most up-to-date high tide roost locations.</p>
September 2021	NRW (Teams meeting)	<p>NRW's comments were discussed in a meeting and the following actions were identified:</p> <ul style="list-style-type: none"> • Whilst NRW highlighted that diurnal surveys alone should provide sufficient evidence required for assessment it was agreed that to be consistent with the Morgan Offshore Wind Project, where nocturnal surveys are being undertaken, that nocturnal surveys would also be undertaken for the Mona Offshore Wind Project. Specific methodology for these surveys would be documented and provided. • NRW to review lessons learnt from previous landfall areas and advise in terms of ornithological constraints. • NRW to share the relevant NRW conservation packages for the protected sites in the vicinity of the landfall options. <p>The Applicant to share initial results and progress with NRW.</p>	<p>The updated survey methodology was issued to NRW. On 11/11/2021 NRW confirmed that their ornithologist was "happy with the added content... and has no further comments to make."</p>
May 2022	<p>Natural resources Wales (Scoping response)</p> <p>Natural resources Wales (Scoping response)</p> <p>Natural resources Wales (Scoping response)</p> <p>Natural resources Wales (Scoping response)</p>	<p>11 Onshore biological environment 169. Description of biodiversity – the Environmental Statement should include a description of all the existing natural resources and wildlife interests within, and in the vicinity of, the proposed development, together with a detailed assessment of the likely impacts and significance of those impacts.</p> <p>170. Significance and Favourable Conservation Status – NRW (A) advise that the EIA considers significance (both alone and in-combination) and where applicable, conservation status. In respect of conservation status, NRW (A) advise consideration is given to Current Conservation Status (CCS), and demonstration of no likely detriment to maintenance of Favourable Conservation Status (FCS) during construction, operation, and decommissioning phases of the scheme.</p> <p>172. Protected Species – NRW (A) advise that the site is subject to assessment to determine the likelihood of protected species and that targeted species surveys are undertaken for all species scoped in. These should comply with current best practice guidelines and in the event that the surveys deviate, or there are good reasons for deviation, that full justification for this is included within the ES.</p> <p>174. Where a European Protected Species is identified and the development proposal is predicted to likely contravene the legal protection they are afforded, a licence should be sought from NRW's Species Licensing Team NRW/Species licensing. The Environmental Statement must include consideration of the requirements for a licence and set out how the works will satisfy the three requirements as set out in the Conservation of Habitats and Species Regulations 2017 (as amended). One of these requires that the development authorised will 'not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status (FCS) in their natural range'. These requirements are also translated into planning policy through Planning Policy Wales (PPW) February 2021, Section 6.4.22 and 6.4.23 and Technical Advice Note (TAN) 5, Nature Conservation and Planning (September 2009). The relevant decision maker will take them into account when considering the EIA where a European Protected Species is present.</p>	<p>Baseline conditions within the intertidal ornithology study area and onshore ornithology study area have been ascertained through a combination of desk study and field surveys.</p> <p>The current conservation status of onshore and intertidal ornithological receptors has been considered in this assessment.</p> <p>Protected species have been surveyed for.</p> <p>Pre-construction site specific surveys will ascertain whether protected species already identified are still present.</p>

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
	NRW (Scoping response)	175. Local Biodiversity Interests – NRW (A) recommend that the developer consults the local authority ecologists on the scope of the work to ensure that regional and local biodiversity issues are adequately considered, particularly those habitats and species listed in the relevant Local Biodiversity Action Plan, and areas that are considered important for the conservation of biological diversity in Wales.	Local authority ecologists were consulted as part of the Onshore Ecology EWG.
	Natural resources Wales (Scoping response)	176. NRW (A) would expect the developer to contact other relevant people/organisations for biological information/records relevant to the site and its surrounds. These include the relevant Local Records Centre and any local ecological interest groups (e.g. bat groups, mammal groups).	Welsh Ornithological Society and Cofnod (local records centre) records have been sought as part of the onshore ornithology desk studies. WeBS data has been sought from the BTO.
June 2022	The Planning Inspectorate (Scoping response)	2.2.2 Part 1, Section 4.4.1 Study areas. The Applicant should seek to agree study areas and receptors with relevant consultation bodies. The Environmental Statement should confirm whether the study area proposed aligns with relevant policy and guidance and provide justification for any divergences. The Environmental Statement should include figures to identify the final study area for each aspect and the location of any static receptors considered in the assessment.	Study areas which include appropriate survey buffers were added to the Mona Proposed Onshore Development Area at landfall were presented at the Onshore Ecology EWG. Study areas design followed latest evidence-based information.
	The Planning Inspectorate (Scoping response)	2.2.3 Part 1, paragraph 4.4.3 Evidence based approach. The Inspectorate acknowledges that data and knowledge regarding the baseline environment exists from surveys, assessments and post- construction monitoring for other proposed and existing offshore wind projects. The Inspectorate understands the benefits of utilising this information to supplement site specific survey data but advises that suitable care should be taken to ensure that the information in the Environmental Statement remains representative and fit for purpose. This should include taking into account the impact of more recent developments that have occurred subsequent to when the data was collected. Similarly, where data from other wind farms is used to support the assessment, the Environmental Statement should confirm that these are truly comparable, for example in terms of the size of foundations/wind turbines. The Applicant should make effort to agree the suitability of information used for the assessments in the Environmental Statement with relevant consultation bodies (e.g. NRW).	Robust data sets have been used to inform the assessment (Table 24.7 and Table 24.8).
June 2022	The Planning Inspectorate (Scoping response)	3.18.1 Part 3, Table 7.4 The impact of temporary and permanent habitat loss on protected habitats and species during operations and maintenance of the Mona onshore transmission assets. On the basis of the likely small scale and nature of habitat loss associated with the operations and maintenance of the Mona onshore transmission assets, the Inspectorate is content that this matter can be scoped out of the assessment.	This is scoped out.
	The Planning Inspectorate (Scoping response)	3.18.2 Part 3, Table 7.4 The impact of pollution caused by accidental spills/contaminant release on protected habitats and species during operations and maintenance of the Mona onshore transmission assets. The Scoping Report proposes to scope out accidental spills/contaminant release from operations and maintenance activities for the Proposed Development. The Inspectorate agrees that these effects are capable of mitigation through standard management practices and can be scoped out of the assessment. The Environmental Statement should provide details of the proposed mitigation measures to be included in the Ecological Management Plan. The Environmental Statement should also explain how such measures will be secured.	This is scoped out.
	The Planning Inspectorate (Scoping response)	3.18.4 Part 3, Paragraphs 7.1.3.4 to 7.1.3.5 Survey methodologies. The Scoping Report confirms that the detailed scope, methodologies and extents of the site-specific surveys identified will be agreed with NRW in advance of survey commencement. The Environmental Statement should provide a clear rationale and a justification as to the approach undertaken to the surveys used to inform the assessment, including reference to agreements reached with relevant consultation bodies, such as NRW.	The intertidal survey methodology were agreed with NRW during Onshore Ecology EWG meetings. The surveys have been conducted in line with the BTO recording protocols for Common Bird Census (CBC) and the Wetland Bird Surveys (WeBS).
	The Planning Inspectorate (Scoping response)	Paragraph: 3.18.6 Confidential annexes: Public bodies have a responsibility to avoid releasing environmental information that could bring about harm to sensitive or vulnerable ecological features. Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the Environmental Statement as a confidential annex. All other assessment information should be included in an Environmental Statement chapter, as normal, with a placeholder explaining that a confidential annex has been submitted to the Inspectorate and may be made available to request.	Rare or endangered breeding birds which required presentation in a confidential annex were not identified in the PEIR.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
	The Planning Inspectorate (Scoping response)	<p>The Inspectorate agrees that significant transboundary effects on the above aspects are unlikely and can be scoped out of the Environmental Statement with the following exceptions:</p> <ul style="list-style-type: none"> • 'Other sea users' – Limited evidence and no quantified analysis has been provided to demonstrate that there would be 'lower levels of offshore cruising and racing' between the UK and Ireland; therefore this matter should be scoped in. • 'Terrestrial ecology and intertidal birds' – the Scoping Report asserts that “due to the large distance between the Mona Onshore Transmission Infrastructure Search Area and Natura 2000 sites located outside the UK, it is not considered feasible that migratory birds directly associated with Natura 2000 sites in other states would be disturbed or suffer from loss of foraging or resting opportunities in any way that would result in likely significant effects on those Natura 2000 sites” (Part 4, Annex A, paragraph 1.4.3.5). The Inspectorate considers that there is insufficient evidence to predict that significant transboundary effects will not arise and does not agree that this matter can be scoped out of the assessment at this stage. Accordingly, the Environmental Statement should include an assessment of these matters or information demonstrating the absence of LSE. • The Inspectorate will undertake an initial transboundary screening exercise on behalf of the Secretary of State under Regulation 32 of the EIA regulations, following adoption of the Scoping Opinion. 	Significant effects to Natural Site Network Sites (formerly recognised as Natura 2000 sites) outside of the UK are assessed for the offshore generation and transmission assets in the Habitat Regulation Assessment, Stage 2: Information to Support Appropriate Assessment (ISAA) of the PEIR.
	Natural resources Wales (Scoping response)	Paragraph 4.6.2.3: We welcome the commitment to explore opportunities to develop enhancement measures and to create beneficial effects.	Noted.
	Natural England (Scoping response)	Paragraph 4.7.2.2: Consideration of climate change impacts over the operational period of Mona Offshore Wind project should be considered. These impacts will become important if they cause an alteration in the baseline conditions and become detectable above natural inter-annual variations.	The implications of climate change with respect to onshore and intertidal ornithology has been considered as part of the future baseline scenario in section 24.4.7 of this chapter.

24.4 Baseline environment

24.4.1 Methodology to inform baseline

Desktop study

24.4.1.1 Relevant ornithological information within the onshore ornithology study area and intertidal ornithology study area were collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 24.7 and Table 24.8 below.

Table 24.7: Summary of key desktop reports for the intertidal ornithology study area.

Title	Source	Year	Author
An assessment of the numbers and distributions of core wintering waterbirds and seabirds in Liverpool Bay area of search	Joint Nature Conservation Committee (JNCC)	2016	Lawson, J., Kober, K., Win, I., Allcock, Z., Black, J., Reid, J.B., Way, L. and O'Brien, S.H.
An assessment of the numbers and distributions of inshore aggregations of waterbirds using Liverpool Bay during the non-breeding season in support of possible SPA identification	JNCC	2006	Webb, A., McSorley, C.A., Dean, B.J., Reid, J.B., Cranswick, P.A., Smith, L. and Hall, C.
Predicting the displacement of common scoter <i>Melanitta nigra</i> from benthic feeding areas due to offshore windfarms	Centre for Applied Marine Sciences, School of Ocean Studies, University of Wales, Bangor	2002	Kaiser, M., Elliot, A., Galanidi, M., Rees, E.I.S., Caldow, R., Stillman, R., Sutherland, W. and Showler, D.
Results of the third Non-Estuarine Waterbird Survey, including Population Estimates for Key Waterbird Species.	BTO Research Report	2017	Austin, G., Frost, T., Mellan, H. and Balmer, D.
Waterbirds in the UK 2019/20: The Wetland Bird Survey	BTO/Royal Society for the Protection of Birds (RSPB)/JNCC	2021	Frost, T.M., Calbrade, N.A., Birtles, G.A., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E.
NEWS Sector Data Request (Sectors Z360104 and Z360103B)	BTO	2015	BTO
WeBS Sector Data Request (WeBS sector 69406 – Abergele to Llandulas)	BTO	2015 to 2021	BTO

Table 24.8: Summary of key desktop reports for the onshore ornithology study area.

Title	Source	Year	Author
Bird Atlas 2007 to 2011	BTO	2013	Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I., Fuller, R.
Birds In Wales. Welsh Bird Report – 2018.	Welsh Ornithological Society	2019	Edited by Hughes, J.
The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second International Union for Conservation of Nature (IUCN) Red List assessment of extinction risk for Great Britain.	British Birds	2021	Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I.
The Breeding Bird Survey 2021	BTO	2022	Harris, S.J., Massimino, D., Balmer, D.E., Kelly, L., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P., Wotton, S. and Gillings, S.
Bird records for the Mona Proposed Onshore Development Area, including a 2km buffer	Nort Wales Local Environmental Records Centre's (Cofnod)	2022	N/A

Identification of designated sites

24.4.1.2 All designated sites within the onshore ornithology study area and intertidal ornithology study area with qualifying interest features that could be affected by the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project were identified using the three-step process described below:

- Step 1: All designated sites of international, national and local importance within the onshore ornithology and intertidal study areas were identified using the Multi Agency Geographic Information for the Countryside (MAGIC) website (Defra, 2023), Conwy County Council website and Denbighshire County Council website
- Step 2: Information was compiled on the relevant ornithological qualifying interests for each of these sites as follows; Liverpool Bay Special Protection Area (SPA), Dee Estuary SPA, Dee Estuary Ramsar, Dee Estuary Site of Special Scientific Interest (SSSI), Coedydd Derw Elwy SSSI, Gronant Dunes and Talacre warren SSSI, Chwythlyn SSSI, Mynydd Hiraethog SSSI, Aber Afon

Conwy SSSI, Llyn Creiniog SSSI, Coedd Llys-Aled SSSI, Morfa Uchaf, Dyffryn Conwy SSSI and Creigiau Rhiwledyn SSSI

- Step 3: Using the above information and expert judgement, sites were included for further consideration if:
 - They overlapped with the Mona Proposed Onshore Development Area
 - Qualifying interests associated with designated sites are located within the potential Zone of Influence (ZOI) for impacts associated with the Mona Proposed Onshore Development Area.

Site specific surveys

24.4.1.3 In order to inform the PEIR, site-specific surveys were undertaken, as agreed with NRW (see Table 24.6 for further details). A summary of the surveys undertaken to date to inform the onshore and intertidal ornithology PEIR is outlined in Table 24.9 below.

24.4.1.4 Site-specific surveys include a programme of wintering and migratory bird surveys to characterise the abundance and distribution of species within the onshore ornithology study area. As the surveys of wintering and migratory birds have not yet been fully undertaken or analysed at this stage of the assessment the results will be reported in the Environmental Statement.

Table 24.9: Summary of site-specific survey data.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
Intertidal ornithology surveys	Mona Proposed Landfall, to the west along the intertidal zone and nearshore waters	A programme of intertidal waterbird surveys to characterise the abundance and distribution of species within the intertidal ornithology study area.	Enfys	December 2021 to June 2023	See volume 7 annex 24.2: Mona intertidal ornithology technical report of the PEIR
Breeding bird surveys	Mona Proposed Onshore Development Area plus a 250m buffer	A programme of breeding bird surveys to characterise the abundance and distribution of species within the onshore ornithology study area.	Enfys and AMC Ecological	April 2022 to July 2022	See volume 7 annex 24.3: Mona onshore ornithology breeding birds technical report of the PEIR

24.4.2 Baseline environment

Desktop studies

- 24.4.2.1 Studies by Webb *et al.* (2006) and Lawson *et al.* (2016) have highlighted that both common scoter *Melanitta nigra* and red-throated diver *Gavia stellata* congregate in the nearshore waters of the onshore intertidal ornithology study area. The nearshore water also offers suitable habitat for common scoter to forage in winter (Kaiser *et al.* 2006). The studies by Webb *et al.* (2006) and Lawson *et al.* (2016) informed the creation and extension of the Liverpool Bay SPA in which the highest concentrations of common scoter were recorded in the nearshore waters between the Dee Estuary and Colwyn Bay where the onshore intertidal ornithology study area is located.
- 24.4.2.2 Further data from the Colwyn Bay and the North Clwyd Coast (2015/2016 to 2019/2020) Wetland Bird Surveys (WeBS) site highlighted the importance of the area for common scoter, the most abundantly recorded species with a peak of 6,334 individuals and a peak of 24 red-throated diver. In addition, the WeBS counts highlighted the presence of a number of wader species, including Eurasian oystercatcher *Haematopus ostralegus* which were the most abundant, followed by Eurasian curlew *Numenius arquata*, ruddy turnstone *Arenaria interpres*, and common redshank *Tringa totanus*. European herring gull *Larus argentus* and black-headed gull *Chroicocephalus ridibundus* were the most frequently recorded gull species with relatively low numbers.
- 24.4.2.3 A full review and analysis of seabird and waterbird assemblages identified from a desktop review of available data and the data sources are detailed in volume 7, annex 24.2: Intertidal ornithology technical report of the PEIR.
- 24.4.2.4 To assess potential breeding bird species within the onshore ornithology study area, records from Cofnod, the BTO Bird Atlas (Balmer *et al.*, 2013) and the Welsh Ornithological Society (WOS) (Birds in Wales, 2018) were reviewed and a suite of species that could potentially breed within the onshore ornithology study area were identified. A full list of these species and their recorded abundances are detailed in volume 7, annex 24.3: Onshore ornithology - breeding birds technical report of the PEIR.
- 24.4.2.5 A number of species identified from the review of Cofnod records are associated with habitats present outside the Mona Proposed Onshore Development Area (e.g. peregrine falcon *Falco peregrinus* and red-billed chough *Pyrrhocorax pyrrhocorax*) which are associated with cliffs or in the case of peregrine falcon, man-made structures. A number of wader species were also identified along with records of sandwich tern *Sterna sandvicensis*; however, the records were principally for non-breeding individuals present in coastal habitats, including those present only during passage. Further records from Cofnod identified occasional rarities such as a historical single Eurasian hoopoe *Upupa epops* which is outside of its typical breeding range.
- 24.4.2.6 Additional species which are either Annex 1 listed species of the EU Birds Directive or Schedule 1 species of the Wildlife and Countryside Act, 1981 as amended, identified through the desk top study include red kite *Milvus milvus*, western barn owl *Tyto alba*, common kingfisher *Alcedo atthis* and red crossbill *Loxia curvirostra*.

24.4.2.7 To assess potential wintering and migratory bird species within the onshore ornithology study area, records from Cofnod, the BTO, and WOS were reviewed. The review identified 65 species that could potentially be present within the onshore ornithology study area. A full list of these species and abundances can be found in volume 7, annex 24.1: onshore ornithology - wintering and migratory birds technical report of the PEIR.

24.4.2.8 In addition to species already identified, the desk top literature review considered additional Annex 1 of the EU Birds Directive and Schedule 1 of the Wildlife and Countryside Act, 1981 as amended species. The following species were identified: merlin *Falco columbarius*, Mediterranean gull *Larus melanocephalus*, redwing *Turdus iliacus*, fieldfare *Turdus pilaris* and common firecrest *Regulus ignicapilla*. Each of these species' presence is associated with migratory movements and widespread wintering influxes during the winter period.

Site specific surveys

Intertidal ornithology baseline characterisation

- 24.4.2.9 A total of 23 species (Table 24.10) were recorded in the intertidal ornithology study area between December 2020 and April 2022, with a peak count of 4,125 individual birds recorded in December 2021. The results of the intertidal ornithological surveys are further detailed in volume 7, annex 24.2: Intertidal ornithological technical report of the PEIR.
- 24.4.2.10 A total of nine SPA and Ramsar qualifying species were recorded during the intertidal ornithological surveys that were named features of either the Liverpool Bay SPA or Dee Estuary SPA and Ramsar.
- 24.4.2.11 A total of four species recorded are features of the Liverpool Bay SPA, which included a peak count of 2,150 common scoter the most abundant species recorded. Along with common scoter the other three seabird species of the Liverpool Bay SPA were recorded during the intertidal surveys offshore and foraging or loafing on the sea water. These included a peak count of 65 red-throated diver *Gavia stellata*, 15 red-breasted merganser *Mergus serrator* and 34 great cormorant *Phalacrocorax carbo carbo*. Fine-scale distribution illustrating space use within the intertidal ornithology study area are shown in volume 7, annex 24.2: Intertidal ornithology technical report of the PEIR.
- 24.4.2.12 The nearshore presence of common scoter and red-throated diver within the intertidal ornithology study area, which lies between the Dee Estuary and Colwyn Bay, is consistent with the findings of digital aerial surveys undertaken by Webb *et al.* (2006) and Lawson *et al.* (2016) which informed the creation and subsequent extension of the Liverpool Bay SPA.
- 24.4.2.13 Five species were recorded which are features of the Dee Estuary SPA and Ramsar, including three wintering waders including monthly peak counts of 188 Eurasian oystercatcher *Haematopus ostralegus*, 71 Eurasian curlew *Numenius arquata* and 34 common redshank *Tringa totanus* and two sandwich tern *Sterna sandvicensis* which are a passage feature of the SPA. In addition, two common ringed plover *Charadrius hiaticula*, were also recorded in February 2022.
- 24.4.2.14 Since the intertidal ornithological surveys to date have only been undertaken during the wintering months and early spring (December 2021 to April 2022), it is

anticipated further species, which are likely to include breeding and passage features of the Dee Estuary SPA, may be recorded during other periods, in particular tern species during summer and passage.

- 24.4.2.15 Whilst the intertidal ornithology study area overlaps with the Dee Estuary SPA, the level of spatial overlap is relatively limited to the outer estuary and coastline on the south side of the estuary. Consequently, many species which are features of the Dee Estuary SPA, in particular wintering waders, such as red knot *Calidris canutus*, Dunlin *Calidris alpina*, bar-tailed godwit *limosa lapponica*, Black-tailed godwit *Limosa limosa* and grey plover *Pluvialis squatarola*, and wildfowl species, such as common shelduck *Tadorna tadorna*, eurasian teal *Anas crecca*, and northern pintail *Anas acuta* among other feature species were absent from the intertidal ornithology study area. This is likely to be because these species utilise valuable saltmarsh and extensive areas of intertidal sand and mudflats more abundantly found within sheltered areas of the estuary outside of the intertidal ornithology study area.

Table 24.10: Peak monthly counts for the diurnal intertidal surveys (December 2021 to April 2022) and comparison with the Liverpool Bay SPA and Dee Estuary SPA cited populations and relevant 5-year annual peak mean (2015/2016 to 2019/2020) WeBS site data (Colwyn Bay and North Clwyd Coast WeBS site or Dee Estuary WeBS site). Species are ranked by taxonomic order.

* % of 5-year annual peak mean based on 2015/16 to 2019/20 Colwyn Bay and the North Clwyd Coast WeBS site data

** % of 5-year annual peak mean based on 2015/16 to 2019/20 Dee Estuary WeBS site

Species	Peak count of birds	% Of SPA citation wintering population	% Of 5-year annual peak mean WeBS count	Liverpool Bay SPA wintering population	5-year annual peak mean WeBS count*	Dee Estuary SPA passage (or breeding) population	Dee Estuary SPA wintering population	5-year annual peak mean WeBS count**
Common Scoter	2,150	4	34*	56,679	6,334	-	-	5,440
Tufted duck <i>Anthya fuligula</i>	2	-	-	-	11	-	-	252
Red-throated diver	65	6	271*	1,171	24	-	-	11
Great crested grebe <i>Podiceps cristatus</i>	98	-	-	-	18	-	-	81
Goosander <i>Mergus merganser</i>	1	-	-	-	1	-	-	5
Red-breasted merganser <i>Mergus serrator</i>	15	9	125*	160	12	-	-	26
Eurasian oystercatcher	188	1	1**	-	380	-	22,627	23,309
Eurasian curlew	71	2	2**	-	190	-	3,899	3,553
Common redshank	34	1	0**	-	124	400	5,293	9,614
Ruddy turnstone	54	-	-	-	132	-	-	204
Common ringed plover	2	-	-	-	45	272	-	539
Whimbrel <i>Numenius pheopus</i>	8	-	-	-	-	-	-	73
Black-headed gull	535	-	-	-	161	-	-	9,860
Common gull <i>Larus canus</i>	713	-	-	-	55	-	-	2,049
Eurasian herring gull	915	-	-	-	227	-	-	9,868
Great black-backed gull <i>Larus marinus</i>	24	-	-	-	6	-	-	267
Lesser black-backed gull <i>Larus fuscus</i>	1	--	-	-	5	-	-	641
Sandwich tern	2		4**	-	55	957	-	1,140
Great cormorant	34	4	2*	826	694	-	-	1,539
Shag <i>Phalacrocorax aristotolis</i>	3	-	-	-	17	-	-	1
Common guillemot <i>Uria aalge</i>	1	-	-	-	-	-	-	-

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Species	Peak count of birds	% Of SPA citation wintering population	% Of 5-year annual peak mean WeBS count	Liverpool Bay SPA wintering population	5-year annual peak mean WeBS count*	Dee Estuary SPA passage (or breeding) population	Dee Estuary SPA wintering population	5-year annual peak mean WeBS count**
Grey heron <i>Ardea cinerea</i>	2	-	-	-	1	-	-	76
Little egret <i>Egretta garzetta</i>	1	-	-	-	2	-	-	253

Onshore breeding birds ornithological baseline characterisation

- 24.4.2.16 A total of 20 species recorded during surveys were identified as breeding determined by either holding territory or displaying territorial behaviour within the onshore ornithology study area during surveys undertaken between April 2022 to July 2022 (Table 24.11). Detailed information on the criteria for identifying species to be recorded during surveys, survey methodology and survey findings are provided in volume 7, annex 24.3: Onshore ornithology – breeding birds technical report of the PEIR.
- 24.4.2.17 No SPA features were identified as breeding. One species, red kite is listed as an Annex 1 species of the EU Birds Directive and is a species of national importance with three breeding territories identified. One breeding territory of little ringed plover was found. The species is protected under Schedule 1 of the Wildlife and Countryside Act, (1981) as amended, and is also considered to be of national importance.
- 24.4.2.18 An additional eight species are listed under Section 7 of the Environment (Wales) Act 2016 and considered to be of regional importance, these species are: common cuckoo *Cuculus canorus*, Eurasian skylark *Alauda arvensis*, song thrush *Turdus philomelos* spotted flycatcher *Muscicapa striata*, common starling *Sturnus vulgaris*, house sparrow *Passer domesticus*, common linnet *Carduelis cannabina*, and Eurasian bullfinch *Pyrrhula pyrrhula*. Of these species house sparrow and song thrush were the most abundant, with 75 and 30 breeding territories identified for each respectively. All the other Section 7 species were identified as holding less than 10 territories each (Table 24.11).
- 24.4.2.19 A total of 11 species are red listed in either the Birds of Conservation Concern (BoCC) 4 Wales red list, Johnston *et al.* (2022) or BoCC5 UK red list (Stanbury *et al.*, 2021) and also considered of regional importance, In addition to species already identified and listed above under Section 7 of the Environment (Wales) Act 2016, red listed species identified as breeding are: common house martin *Delichon urbicum*, mistle thrush *Turdus viscivorus*, common whitethroat *Sylvia communis*, willow warbler *Phylloscopus trochilus* and European greenfinch *Chloris chloris*.
- 24.4.2.20 The remaining species recorded and identified as breeding are of local Importance only, with their highest conservation importance being of either BoCC4 Wales amber listed or BoCC5 UK amber listed, these species are Eurasian sparrowhawk *Accipiter nisus*, stock dove *Columba oenas*, meadow pipit *Anthus pratensis*, grey wagtail *Motacilla cinerea* and common redstart *Phoenicurus phoenicurus*.

Table 24.11: Summary of breeding bird territories identified by species in 2022 and their level of conservation importance.

Species	No. Territories identified	Conservation importance				
		High		Medium		
		Annex 1	Schedule 1	Section 7	BOCC5 UK - Red	BOCC4 Wales - Red
Eurasian sparrowhawk	1					

Species	No.	Conservation importance				
Red kite	3	Yes	Yes			
Little ringed plover	1		Yes			
Stock dove	4					
Common cuckoo	2			Yes	Yes	
Eurasian skylark	4			Yes	Yes	
Common house martin	9				Yes	Yes
Meadow pipit	1					
Grey wagtail	2					
Common redstart	16					
Mistle thrush	10				Yes	
Song thrush	30			Yes		
Common whitethroat	7					Yes
Willow warbler	10					Yes
Spotted flycatcher	2			Yes	Yes	Yes
Common starling	1			Yes	Yes	Yes
House sparrow	75			Yes	Yes	
European greenfinch	2				Yes	Yes
Common linnet	6			Yes	Yes	Yes
Eurasian bullfinch	9			Yes		

24.4.3 Designated sites

24.4.3.1 Designated sites identified under step 3 in section 24.4 of this chapter are described below in Table 24.12.

Table 24.12: Designated sites and relevant qualifying interests for the onshore and intertidal ornithology study areas.

Designated site	Closest distance to the Mona Proposed Landfall (km)	Closest distance to the Mona Proposed Onshore Development Area (km)	Relevant qualifying interest
Liverpool Bay SPA	0.0km	0.3km	<p><u>Non-Breeding</u> Common scoter, red-throated diver, red-breasted merganser, great cormorant, little gull <i>Hydrocoloeus minutus</i></p> <p><u>Breeding</u> Little tern <i>Sternula albifrons</i>, common tern <i>Sterna hirundo</i></p>
Dee Estuary SPA	13.1km	10.6km	<p><u>Winter</u> Common shelduck, Eurasian teal, Northern pintail, Eurasian oystercatcher, grey plover, red knot, dunlin, Eurasian curlew, bar-tailed godwit, black-tailed godwit, common redshank</p> <p><u>Passage</u> Common redshank, sandwich tern</p> <p><u>Breeding</u> Little tern, common tern</p>
Dee Estuary Ramsar – In addition to the species mentioned in the SPA citation	13.1km	10.6km	<p><u>Winter</u> Eurasian wigeon <i>Anas penelope</i>, great crested grebe, great cormorant, sanderling <i>Calidris alba</i></p> <p><u>Passage</u> Common ringed plover</p> <p><u>Breeding</u> Common redshank</p>
Dee Estuary SSSI – In addition to the species mentioned in the SPA and Ramsar citations	13.1km	10.6km	<p><u>Passage</u> Black-tailed godwit</p> <p><u>Breeding</u> Common reed warbler <i>Acrocephalus scirpaceus</i></p>
Coedydd Derw Elwy SSSI	Not relevant	3.9km	<p><u>Breeding</u> European pied flycatcher <i>Ficedula hypoleuca</i>, common redstart, and wood warbler <i>Philoscopus sibilatrix</i></p>

24.4.4 Important ecological features

24.4.4.1 In accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines on Ecological Impact Assessment (CIEEM, 2018), the assessment of the likely ecological effects of the Mona Offshore Wind Project and identification of important ecological features has focused on VORs. VORs are species of high ecological value, present within the ZOI of the Mona Proposed Onshore Development Area, that any potential impact upon them as a result of the Mona Offshore Wind Project would be considered to be significant.

24.4.5 Intertidal seabird and waterbird VORs

24.4.5.1 The interest features of Liverpool Bay SPA and Dee Estuary SPA, SSSI, and Ramsar site are of principal significance to the assessment of the Mona Proposed Onshore Development Area in the intertidal ornithology study area and the onshore ornithology study area.

24.4.5.2 In describing the baseline bird populations of the intertidal ornithology study area and the onshore ornithology study area in terms of conservation importance, the following criteria have been used to identify species potentially sensitive to relevant potential impacts:

- A seabird species cited as an interest feature of the Liverpool Bay SPA or waterbird species cited as an interest feature of the Dee Estuary SPA (Natural England, 2007).
- A waterbird species cited as part of the interest feature of the Dee Estuary Ramsar site (JNCC, 2008) under (i) Ramsar criterion 6 (species/populations occurring at levels of international importance) and (ii) ‘noteworthy fauna’10 as species outside the breeding season currently occurring at national levels.
- A waterbird species cited as a species of scientific interest in the Dee Estuary SSSI occurring at nationally important population levels and notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended).
- A waterbird species that occurs on the Dee Estuary in nationally important numbers according to the most recently available WeBS data (2015/16 – 2019/20), and for which their numbers in baseline data for the cable landfall survey area exceeded a peak of 10 birds in the survey period. Such species may be a significant component species of the SPA assemblage.

24.4.5.3 A list of VOR species is detailed in Table 24.13 of this chapter.

24.4.5.4 In the site-specific surveys conducted to date, several species were identified as potential VORs based on the above-mentioned criteria (common tern, little tern, bar-tailed godwit, black-tailed godwit, grey plover, red knot, dunlin, sanderling, common shelduck, Eurasian teal, Eurasian wigeon, northern pintail and little gull). However, these species were not recorded during the intertidal ornithological surveys reported to date (December 2021 to April 2022) and, as such, the above species are excluded from the assessment of significance.

24.4.5.5 Based on the information presented in Section 24.4.2 and the above-described criteria in the current section, a group of potential VORs will be taken forward for assessment of significance. The species and assemblage being taken forward to assessment of significance are presented in Table 24.13 below.

Table 24.13: Seabird VORs identified within the onshore intertidal study area.

VOR	Conservation status	Conservation importance
Common scoter	Qualifying species of the Liverpool Bay SPA (Article 4.1), UK Red listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Amber listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the Wildlife and Countryside Act (WCA) (1981).	International
Red-throated diver	Qualifying species of the Liverpool Bay SPA (Article 4.1), Red listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Amber listed BoCC4 (Johnston <i>et al.</i> , 2022), Annex 1 of the Birds Directive, Schedule 1 of the WCA 1981.	International
Red-breasted merganser	Qualifying species of the Liverpool Bay SPA (Article 4.1), UK Amber listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Red listed BoCC4 (Johnston <i>et al.</i> , 2022).	International
Sandwich tern	Qualifying species of the Dee Estuary SPA (Article 4.2 Assemblage), UK Amber listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Amber listed BoCC4 (Johnston <i>et al.</i> , 2022), Annex 1 of the Birds Directive, Schedule 1 of the WCA 1981.	International
Great cormorant	Qualifying species of the Liverpool Bay SPA (Article 4.1), UK Green listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Green listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the WCA 1981.	International

Table 24.14: Waterbird VORs identified within the onshore intertidal study area.

VOR	Conservation status	Conservation importance
Eurasian oystercatcher	Qualifying species of the Dee Estuary SPA (Article 4.1), UK Amber listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Amber listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the WCA 1981.	International
Eurasian curlew	Qualifying species of the Dee Estuary SPA (Article 4.1), UK Red listed BoCC5 (Stanbury, <i>et al.</i> , 2021), Wales Red listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the WCA 1981.	International
Common redshank	Qualifying species of the Dee Estuary SPA (Article 4.1), UK Amber listed BoCC5 (Stanbury, <i>et al.</i> , 2021), Wales Red listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the WCA 1981.	International
Common ringed plover	Noteworthy species of the Dee Estuary Ramsar, UK Green listed BoCC5, (Stanbury <i>et al.</i> , 2021), Wales Red listed BoCC4 (Johnston <i>et al.</i> , 2022), Schedule 1 of the WCA 1981.	National
Little egret	Non-qualifying species of interest of the Dee Estuary SPA, UK Green listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Green listed BoCC4 (Johnston <i>et al.</i> , 2022), Annex 1 of the Birds Directive, Schedule 1 of the WCA 1981.	National

24.4.6 Onshore breeding bird VORs

- 24.4.6.1 Consistent with the criterion used to determine intertidal ornithological VORs, VORs for the onshore ornithological study area have been determined based on the conservation importance of each species as detailed in Table 24.19, with species determined to be either very high (European or international importance) or high (national importance) in conservation importance considered further in the assessment.
- 24.4.6.2 Whilst there were no species recorded breeding in the onshore ornithological study area of international or European conservation importance, two species; red kite and little ringed plover, were recorded and determined to be of high conservation importance based on their national conservation importance as either listed as Annex 1 species in the EU Birds Directive and/or Schedule 1 of the Wildlife and Countryside Act (1981) as amended. Both red kite and little ringed plover have been identified as VORs (Table 24.15) and the significance of any potential impacts considered in this assessment.
- 24.4.6.3 Red kite breeding territories were recorded in three separate locations, each in woodland areas and between 4.5km and 5.6km apart from each other.
- 24.4.6.4 A single active little ringed plover nest was found to be active near Llanelwy within the 250m buffer outside of the Mona Proposed Onshore Development Area. The nest was recorded on former industrial ground approximately 500m northeast from the Bodelwyddan National Grid Substation.
- 24.4.6.5 A further 13 species recorded as breeding in the onshore ornithology study area were of medium conservation importance based on their regional Importance and listing on one or more of; the Section 7 Environment (Wales) Act 2016, UK Red listed BoCC5 (Stanbury *et al.*, 2021) and/or Wales Red listed BoCC4 (Johnston *et al.*, 2022).
- 24.4.6.6 Species breeding and of medium conservation importance include relatively abundant and common summer migrants: common cuckoo, common whitethroat, willow warbler, and spotted flycatcher, farmland species; Eurasian skylark and common linnet, woodland or woodland edge species; mistle thrush, song thrush, European greenfinch and Eurasian bullfinch, species associated with either pasture or the built environment; common starling, house sparrow and common house martin. These species are not considered for assessment of significance.
- 24.4.6.7 Additional species recorded holding territory and considered as of relatively low conservation importance and therefore local conservation importance only, based on their highest conservation status being listed as Amber on either the UK BoCC5 (Stanbury *et al.*, 2021) and/or Wales BoCC4 (Johnston *et al.*, 2022) include Eurasian sparrowhawk, stock dove, meadow pipit, grey wagtail, and common redstart. These species are not considered further in the impact assessment.

Table 24.15: VORs identified in the onshore ornithology study area.

VOR	Conservation status	Conservation importance
Red kite	Annex 1 of the EU Birds Directive. Schedule 1 of the WCA (1981). UK Green listed BoCC5 (Stanbury <i>et al.</i> , 2021), Wales Green listed BoCC4 (Johnston <i>et al.</i> , 2022),	National

VOR	Conservation status	Conservation importance
Little ringed plover	Schedule 1 of the WCA (1981). UK Green listed BoCC5 (Stanbury et al., 2021), Wales Green listed BoCC4 (Johnston et al., 2022),	National

24.4.7 Future baseline scenario

- 24.4.7.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires that "*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*" is included within the Environmental Statement.
- 24.4.7.2 In the event that Mona Offshore Wind Project does not come forward, an assessment of the future baseline conditions has been carried out and is described within this section.
- 24.4.7.3 For migratory birds, many of the current and future threats relate to changing availability of wintering, stopover and breeding locations along their migratory pathways. Migratory species differ from other species because individuals depend on multiple locations that may be spread over continents, and individual sites can support substantial proportions of entire populations during the course of annual migrations. The loss of key locations at any point on migratory routes can therefore have far-reaching consequences for whole populations. As such, environmental changes taking place on the breeding grounds (e.g. in the Arctic and the sub-Arctic regions for wader species) can impact population size on the wintering grounds (e.g. in the temperate and tropic regions).
- 24.4.7.4 There are a number of short-term or persistent processes that are likely to affect population significantly. Sutherland *et al.* (2012) in a horizon scanning of current and potential future threats to migratory waders listed punctuated threats (e.g. volcanoes eruption), gradual threats (e.g. climate change) and future threats (e.g. microplastic). The biggest threat to waterbirds is habitat loss, be it by destruction or degradation, including, intertidal reclamation in estuaries, changes in agricultural practices, drainage, pollution, disturbance, dredging, river management and ploughing up of grasslands. In addition, sea-level rise due to climate change is predicted to reduce the availability of intertidal habitats used by foraging waterbirds. Climate change may also lead to a shift in the distribution of breeding and wintering birds, including waterbirds, passerines and birds of prey. Therefore, the combined effect of land use change and climate change may result in population changes at the medium to long-term scale.
- 24.4.7.5 Lastly, the prevalence of Highly Pathogenic Avian Influenza (HPAI) in wild bird populations may impact abundance and vital rates (e.g. productivity and survival) of birds in the short, medium and long-term. Although the impact and spread across bird taxa is unclear, there is the risk that in the future the vital rates of seabirds and waterbirds may be affected.

24.4.8 Data limitations

- 24.4.8.1 Baseline characterisation of the onshore and intertidal ornithology study areas and initial assessments of significance have used site-specific data from surveys conducted to date over a period of five months (December 2021 to April 2022) for the onshore intertidal ornithology study area and four months (April 2022 to July 2022) for the onshore breeding bird study area.
- 24.4.8.2 Surveys conducted within the intertidal ornithology study area commenced in December 2021 and are expected to conclude in November 2023 (two years of data). Although the data reported for this assessment is from the period December 2021 to April 2022 and does not cover the spring or autumn passage periods, these periods will be included for assessment in the Environmental Statement.
- 24.4.8.3 All surveys conducted have been undertaken following accepted industry standard methodologies. The surveys conducted may be considered to represent a snapshot of each month and in combination each survey period and whilst capable of determining individual species presence and estimates of abundance they can never be definitive. However, the sampling regimes adopted, and methodologies followed are considered appropriate to this assessment and have been previously agreed by Statutory Nature Conservation Bodies (SNCBs) as suitable for baseline characterisation.
- 24.4.8.4 Walkover surveys were conducted for the onshore breeding bird surveys from both Public Rights of Way (PRoW) and private land. Whilst surveys conducted from PRoW were undertaken as planned across a total of four visits, surveys from private land were limited in their temporal coverage due to restrictions in access permission during the breeding bird season. Consequently, some areas of the onshore breeding bird study area were surveyed only once or twice, following access permission being granted. Full details and maps of the survey spatial coverage are detailed in volume 7, annex 24.3: Onshore ornithology - breeding birds technical report of the PEIR. To compensate for limited spatial coverage, survey findings and their significance were incorporated with findings of the desktop studies when considering the baseline characterisation of the onshore ornithology study area. In addition, where temporal coverage was limited to only one or two surveys, records with one registration of breeding behaviour (singing, carrying food, etc) were classed precautionarily as sufficient evidence of a species breeding in the territory analysis. As a result of these measures the detection of individual species breeding presence is managed to an acceptable level and of sufficient certainty for this assessment.
- 24.4.8.5 Due to recent changes in the access areas identified as being necessary for works at the landfall, the intertidal ornithology survey data reported to date (Dec 2021 to Apr 2022) does not include a 500m buffer to the east of the newly identified intertidal access area (Figure 24.1).
- 24.4.8.6 Previous outbreaks of HPAI have tended to hit wintering waterfowl, subsiding as wintering flocks disperse. Over the winter of 2021 and 2022 an outbreak of HPAI was confirmed in barnacle geese wintering on the Solway Firth and from late spring 2022, increasing numbers of reports of the disease were received from seabird colonies around the northern UK (Pearce-Higgins *et al.*, 2022). The extent of impact of HPAI on individual species is assessed through ongoing monitoring. To date, there is no evidence to suggest that mass mortalities of birds have occurred in 2021/2022 in North Wales to the same extent as northern UK colonies of seabirds.

As the baseline (first year of surveys) was characterized during the outbreak, there is potential that the baseline is not representative of a typical year. However, a second year of surveys (2022 to 2023) are ongoing, which would capture inter-annual variability.

24.4.8.7 It must be noted that bird populations are subject to natural fluctuations in response to a range of environmental conditions (e.g. weather) and this may cause inter-annual variations in abundance. The extent of any potential negative impacts of HPAI on population sizes has not yet been quantified. Increase coordinated seabird monitoring in 2022/23 (Pearce-Higgins *et al.*, 2022) and reporting might contribute to greater quantitative evidence for individual species at a population level.

24.5 Impact assessment methodology

24.5.1.1 The onshore and intertidal ornithology impact assessment has followed the methodology set out in volume 1, chapter 5: EIA methodology of the PEIR. Specific to the onshore and intertidal ornithology impact assessment, the following guidance documents have also been considered:

- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications (Natural England, 2022)
- Guidelines on Ecological Impact Assessment (CIEEM, 2018).

24.5.1.2 In addition, this chapter has considered the legislative framework as defined by:

- The Conservation of Habitats and Species Regulations 2017 (as amended)
- The Wildlife and Countryside Act 1981 (as amended)
- European Commission ('EC') Directive 2009/147/EC (codified version of 79/409/EC) on the Conservation of Wild Birds (the 'Birds Directive')
- Ramsar Convention on Wetlands of International Importance 1971
- Section 7 of the Environment (Wales) Act 2016.

24.5.2 Impact assessment criteria

The assessment process considers the best practice set out in Guidelines for Ecological Impact Assessment (CIEEM, 2018).

24.5.2.1 The criteria for defining magnitude in this chapter are outlined in Table 24.16 below. This set of definitions has been determined on the basis of changes to bird populations.

Table 24.16: Definition of terms relating to the magnitude of an impact.

Magnitude of impact	Definition
High	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that is predicted to irreversibly alter the population in the short to long term and to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt long-term. Impacts predicted to be reversed in the long-term (i.e. more than five years) following cessation of the project activity.

Magnitude of impact	Definition
Medium	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that occurs in the short and long-term, but which is not predicted to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt medium to long term. Impacts predicted to be reversed in the medium-term (i.e. no more than five years) following cessation of the project activity.
Low	A change in the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site that is sufficiently small-scale or of short duration to cause no long-term harm to the feature/population. Impacts present for a short to medium duration. Impacts predicted to be reversed in the short-term (i.e. no more than one year) following cessation of the project activity.
Negligible	Very slight change from the size or extent of distribution of the relevant biogeographic population or the population that is the interest feature of a specific protected site. Impacts present for a short duration. Impacts predicted to be reversed rapidly (i.e. no more than circa six months) following cessation of the project related activity.
No change	No loss or alteration of characteristics, features or elements; no observable impact either adverse or beneficial.

24.5.2.2 The criteria for defining recoverability and sensitivity in this chapter are outlined in Table 24.17 and Table 24.18 below. The definition of sensitivity considers the vulnerability and recoverability of a receptor as well as taking into account the conservation importance of each receptor.

Table 24.17: Definition of sensitivity of the receptor.

Sensitivity	Definition
Very High	Bird species has high or very high conservation importance, high vulnerability to impact and has no ability to recover.
	Bird species has very high conservation importance, high vulnerability to impact and has low recoverability.
High	Bird species has high or very high conservation importance, medium or high vulnerability to impact and has medium recoverability.
	Bird species has high conservation importance, medium vulnerability to impact and has low recoverability.
	Bird species has medium conservation importance, high vulnerability to impact and has low recoverability.
Medium	Bird species has high conservation importance, low vulnerability to impact and has low to medium recoverability.
	Bird species has medium conservation importance, low, medium or high vulnerability to impact and has medium recoverability.
Low	Bird species has medium conservation importance, medium vulnerability to impact and high recoverability.
	Bird species has low conservation importance, medium or high vulnerability to impact and medium or high recoverability.
Negligible	Bird species has low conservation importance, low vulnerability to impact and medium or high recoverability.

Sensitivity Definition	
	Bird species is not vulnerable to impacts.

Table 24.18: Definition of recoverability.

Recoverability Definition	
High	A species with a low to medium reproductive success and a stable or increasing UK trend in breeding abundance and productivity.
Medium	A species with a low reproductive success and a stable or increasing UK long-term trend in breeding abundance and productivity.
Low	A species with a low reproductive success and a declining UK long-term trend in breeding abundance and productivity or uncertainty regarding the long-term trend (due to data availability).

24.5.2.3 It should be noted that high vulnerability and/or low recoverability are not necessarily linked with high conservation importance within a particular impact. A receptor could be categorised as being of high conservation importance (e.g. an interest feature of a SPA) but have a low or negligible physical/ecological vulnerability to an effect and vice versa. Determination of sensitivity takes these differing aspects into consideration.

24.5.2.4 The conservation importance of ornithological receptors is based on the population from which individuals are predicted to be drawn. This reflects current understanding of the movements of species, with site-based protection (e.g. SPAs) generally limited to specific periods of the year (e.g. the breeding season). Therefore, conservation importance can vary through the year depending on the relative sizes of the number of individuals predicted to be at risk of impact and the population from which they are estimated to be drawn. Conservation importance also considers species of national importance, regional importance and local importance, for which further criteria are defined in Table 24.19.

Table 24.19: Definition of conservation importance of the receptor.

Conservation importance	Definition
Very High	Species of international/European importance: <ul style="list-style-type: none"> • Cited interest feature of SPA or Ramsar • Population present within survey area exceeds 1% threshold of international importance.
High	Species of national importance: <ul style="list-style-type: none"> • Species listed on Annex 1 of the EU Birds Directive • Species that contribute to the assemblage of a SSSI • Species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended • Population present within survey area exceeds 1% threshold of National Importance.
Medium	Species of regional importance: <ul style="list-style-type: none"> • Species listed on the UK BoCC5 Red list or BoCC4 Wales Red list • Species listed in Section 7 of the Environment (Wales) Act, 2016 • Species considered to be of regional significance due to population size or distribution restrictions.
Low	Species of local importance: <ul style="list-style-type: none"> • Species listed on the UK BoCC5 Amber list or BoCC4 Wales Amber list.
Negligible	<ul style="list-style-type: none"> • All species of lowest conservation importance (e.g. species listed on the UK BoCC5 Green list or BoCC4 Green list.

24.5.2.5 The significance of the effect upon ornithological receptors is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The method employed for this assessment is presented in Table 24.20. Where a range of significance of effect is presented in Table 24.20, the final assessment for each effect is based upon expert judgement.

24.5.2.6 For the purposes of this assessment, any effects with a significance level of minor or less have been concluded to be not significant in terms of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

Table 24.20: Matrix used for the assessment of the significance of the effect.

Sensitivity of Receptor	Magnitude of Impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major
Very High	No change	Minor	Moderate or Major	Major	Major

24.5.3 Designated sites

24.5.3.1 Where National Site Network sites (i.e. internationally designated sites) are considered, this chapter summarises the assessments made on the interest features of internationally designated sites as described within section 24.4.2 of this chapter (with the assessment on the site itself deferred to the Habitat Regulation Assessment, Stage 2: ISAA of the PEIR). With respect to nationally and locally designated sites, where these sites fall within the boundaries of an internationally designated site (e.g. SSSIs which have not been assessed within the ISAA), only the international site has been taken forward for assessment. This is because potential effects on the integrity and conservation status of the nationally designated site are assumed to be inherent within the assessment of the internationally designated site (i.e. a separate assessment for the national site is not undertaken).

24.5.3.2 The ISAA has been prepared in accordance with Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2022) and has been submitted alongside the PEIR.

24.5.4 Maximum design scenario

24.5.4.1 The Maximum Design Scenario (MDS) identified in Table 24.21 below have been selected as those having the potential to result in the greatest effect on an identified ornithological receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in volume 1, chapter 3: Project description of the PEIR. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g. different infrastructure layout), to that assessed here be taken forward in the final design scheme.

Table 24.21: Maximum design scenario considered for the assessment of potential impacts on the Mona Offshore Wind Project.

^a C=construction, O=operations and maintenance, D=decommissioning

Potential impact	Phase ^a			Maximum Design Scenario	Justification
	C	O	D		
The impact of temporary and permanent habitat loss during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	<p>Construction phase</p> <p><u>Open cut trenching at the Landfall:</u></p> <ul style="list-style-type: none"> There will be four trenches. Trenches will be 3m wide at the top and 3m deep, the length of the trench will be 1.5km and it will run between MHWS and MLWS. This will equate to a trench area of 18,000m². In addition, the working areas will extend to 25m at either side. This will equate to a total area of the intertidal that will be subject to works of 306,000m². Works are expected to take up to 33 months to complete. <p><u>Trenchless techniques at the landfall:</u></p> <ul style="list-style-type: none"> Four Horizontal Directional Drilling cable ducts will need to be installed running 2km between MHWS and MLWS. The total working area for each Horizontal Directional Drilling compound is 100x150m. <p><u>Open cut trenching along the Onshore Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent Onshore Cable Corridor is up to 540,000m² based on a corridor measuring 30m wide and 18km in length. The temporary working corridor requires an additional 70m wide corridor (making the total width of the Onshore Cable Corridor (temporary and permanent requirements) 100m wide representing a total area of habitats that will be subject to works of 1,800,000m². This corridor will contain four trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 576m³ of material excavated for the link boxes based on 96 link boxes). There is one haul road within the Onshore Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Haul roads will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400mm and a maximum thickness of 1000mm. Works are expected to take 33-months to complete. <p><u>Open cut trenching along the 400kV Grid Connection Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent 400kV Grid Connection Cable Corridor is up to 48,000m² based on a corridor measuring 16m wide and 3km in length. The temporary working corridor requires an additional 44m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 60m wide representing a total area of habitats that will be subject to temporary works of up to 180,000m². This corridor will contain two trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 60m³ of material excavated for the link boxes based on 10 link boxes). There is one haul road within the 400kV Grid Connection Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Works are expected to take 33-months to complete. <p><u>Trenchless techniques:</u></p> <ul style="list-style-type: none"> The maximum number of Horizontal Directional Drilling (HDD) locations along the Onshore Cable Corridor is 72 and 12 for the 400kV Grid Connection Cable Corridor. Primary HDD operations will require a compound, these will measure up to 150m x 100m. Secondary HDDs will require a smaller compound (measuring up to 30m x 20m) and will be located within the 100m temporary construction corridor. <p><u>Construction compounds:</u></p> <ul style="list-style-type: none"> Up to two primary construction compounds (each measuring 150m x 150m) and up to 10 secondary construction compounds (each measuring 150m x 100m) will be located along the Onshore Cable Corridor. The compounds will be located within the Mona Proposed Onshore Development Area. Construction compounds will be prepared by removing and storing soils and then constructing hardstanding areas using crushed stone or other suitable material. These will be in place for the duration of the works (33-months). <p><u>Onshore Substation:</u></p>	<p>Construction and decommissioning of the Mona Offshore Wind Project may result in the temporary (e.g. onshore export cable) or permanent (e.g. Mona Onshore Substation) loss of habitat, which may support protected or notable species.</p> <p>The use of open cut trenching at the landfall represents the greatest temporary habitat loss to the intertidal zone. The maximum area required for the construction of the landfall and the associated infrastructure represents the maximum area of habitat that will be temporarily lost during the nine-month construction of the project.</p> <p>The use of open cut trenching methods along the onshore cable route and 400kV grid connection cable route represent the greatest potential for permanent and temporary damage to habitats. The maximum area required for the construction of the Onshore Cable Corridor, 400kV Grid Connection Cable, and the associated infrastructure represents the maximum area of habitat that will be temporarily lost during the 33-month construction of the project.</p> <p>The maximum area required for the construction of the Onshore Substation and permanent access road represents the maximum area of habitat that will be lost during the 35-year lifespan of the project.</p> <p>The Onshore Cable and 400kV Grid Connection Cable shall remain in situ in decommissioning phase with only the link boxes needing removal. The maximum area of these plus the area of the haul road (assumed for access) represents the maximum area of habitat that will be temporarily lost during decommissioning of the project.</p>

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<ul style="list-style-type: none"> The maximum footprint of the Onshore Substation will measure up to 125,000m² and will be located within the Onshore Substation zone. This area will include the substation buildings and the earthworks to create the platform. The Onshore Substation will comprise up to four buildings. The maximum dimensions of the main building are 20m high, 40m wide and 90m long. Access to the substation will be via a new permanent access road measuring up to 8m wide and 1.2km in length, or 9,600m². The maximum search area for landscape planting around the Onshore Substation is 469,733m². This area includes the footprint of the Onshore Substation, landscape planting and the attenuation pond. Works are expected to take 33-months to complete. <p>Operations and maintenance phase</p> <ul style="list-style-type: none"> The area that will be subject to permanent loss will be 125,000m² at the substations and the link boxes. In addition, the area of permanent loss from new permanent access road will be 9,600m². The expected lifetime of the Mona Offshore Wind Project is 35 years. <p>Decommissioning phase</p> <p><u>Onshore Cable Corridor works:</u></p> <ul style="list-style-type: none"> The onshore cable and 400kV Grid Connection Cable will remain in situ but the link boxes will be removed. The maximum number of link boxes along the Onshore Cable Corridor is 96 (based on a distance of 750m between each link box on up to four trenches). The area of each link box is up to 6m². Therefore, 636m² of land will need to be disturbed. <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> The Mona Onshore Substation and permanent access road will be removed. 	
<p>The impact of habitat disturbance during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.</p>	<p>✓</p>	<p>✓</p> <p>✓</p> <p>Construction phase</p> <p><u>Open cut trenching at the Landfall:</u></p> <ul style="list-style-type: none"> There will be four trenches. Trenches will be 3m wide at the top and 3m deep, the length of the trench will be 1.5km and it will run between MHWS and MLWS. This will equate to a trench area of 18,000m². In addition, the working areas will extend to 25m at either side. This will equate to a total area of the intertidal that will be subject to works of 306,000m². Cable laying and trenching equipment and vessels will be used to install the cable, and vehicles used for transportation and access. The following plant may be used: Mobile Crane, Flat bed articulated truck, Rock Breakers/Concrete Munchers, Road Dump Trucks, CAT 320 Excavators, Compressors (Diesel) (Atlas Copco), Piling Rigs, Lighting Towers (Diesel), Road Recycling Skip Trucks, Ready-mix Concrete, Stone Delivery Truck, Teleporter/Forks (JCB), Flat bed articulated truck, Flat Bed/Hiab, Concrete Pumps, HDD Drilling Rig, Bentonite Mixing & Recycling Plant, Plastic Welding Plant (butt fusion welders), Temporary Welfare Facilities (incl. diesel genies), Cable Winches, Cable Drums, Ride on Roller, Ramax Works are expected to take 33 months to complete. <p><u>Onshore Cable Corridor works</u></p> <ul style="list-style-type: none"> The areas of the Onshore Cable Corridor that are subject to disturbance are set out below. It is assumed that works taking place within the ZOI of sensitive onshore breeding receptor species will cause disturbance. The ZOI for breeding red kite is up to 300m (Goodship & Fellows, 2022). Works within a radius of 300m (or 282,743m²) around any nest sites found during pre-construction works will be assumed to cause disturbance. No data is available for little ringed plover, although the ZOI for breeding ringed plover extends to 200m (Goodship & Fellows, 2022). Works within a radius of 200m (or 125,644m²) around the nest site will be assumed to cause disturbance. <p><u>Open cut trenching along the Onshore Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent Onshore Cable Corridor is up to 540,000m² based on a corridor measuring 30m wide and 18km in length. The temporary working corridor requires an additional 70m wide corridor (making the total width of the Onshore Cable Corridor (temporary and permanent requirements) 100m wide representing a total area of 	<p>Construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project may result in the disturbance of habitat (e.g. movement, noise, light spill, vibration), which may support protected or notable species.</p> <p>The use of open cut trenching at the landfall represents the greatest potential for disturbance in the intertidal zone. The maximum area required for the construction of the landfall plus the largest accepted ZOI for different guilds represents the greatest area that will be subject to disturbance during the nine-month construction of the project.</p> <p>The use of open cut trenching methods along the onshore cable route and 400kV grid connection cable route represent the greatest potential for disturbance. The maximum area required for the construction of the Onshore Cable Corridor, 400kV Grid Connection Cable, the Onshore Substation, the permanent access road, and the associated infrastructure represents the maximum area that will be subject to disturbance to onshore wintering and breeding birds during the 33-month construction period.</p> <p>Maintenance during the operational phase represents potential for disturbance.</p> <p>The Onshore Cable Corridor and 400kV grid connection cable shall remain in situ in decommissioning phase with only the link boxes needing removal. The maximum area of these plus the area of the haul road (assumed for access), and the removal of the substation and permanent access road, represents the maximum area that will be subject to disturbance during decommissioning of the project.</p>

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<p>habitats that will be subject to works of 1,800,000m². This corridor will contain four trenches.</p> <ul style="list-style-type: none"> The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 576m³ of material excavated for the link boxes based on 96 link boxes). There is one haul road within the Onshore Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Haul roads will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400mm and a maximum thickness of 1000mm. Works are expected to take 33-months to complete. The additional plant may be used for the Onshore Cable Corridor and the 440kV Cable Corridor: Mobile Crane, Cherry Pickers (Diesel) (Genie Lift), Rock Breakers/Concrete Munchers, Site Dumpers (swivel and straight), CAT 320 Excavators, Compressors (Diesel) (Atlas Copco), Piling Rigs, Lighting Towers (Diesel), Road Recycling Skip Trucks, Ready-mix Concrete, Teleporter/Forks (JCB), Flat bed articulated truck, Flat Bed/Hiab, Stone Delivery Truck, Concrete Pumps, HDD Drilling Rig, Bentonite Mixing & Recycling Plant, Plastic Welding Plant (butt fusion welders), Temporary Welfare Facilities (incl. diesel genies), Cable Winches, Cable Drum Trailers, Road Planer, Road Paver, Tipper Truck, 8 Wheel Grab Truck, Hotbox Truck, Tractor with low loader trailer, Tractor with Water Tanker, Tractor dump trailers, Ride on Roller, Wheeled Excavator, Backhoe Loader, Ramax. <p><u>Open cut trenching along the 400kV Grid Connection Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent 400kV Grid Connection Cable Corridor is up to 48,000m² based on a corridor measuring 16m wide and 3km in length. The temporary working corridor requires an additional 44m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 60m wide representing a total area of habitats that will be subject to temporary works of up to 180,000m². This corridor will contain two trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 60m³ of material excavated for the link boxes based on 10 link boxes). There is one haul road within the 400kV Grid Connection Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Works are expected to take 33-months to complete. <p><u>Construction compounds:</u></p> <ul style="list-style-type: none"> Up to two primary construction compounds (each measuring 150m x 150m) and up to 10 secondary construction compounds (each measuring 150m x 100m) will be located along the Onshore Cable Corridor. The compounds will be located within the Mona Proposed Onshore Development Area. Construction compounds will be prepared by removing and storing soils and then constructing hardstanding areas using crushed stone or other suitable material. These will be in place for the duration of the works (33-months). <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> The maximum footprint of the Onshore Substation will measure up to 125,000m² and will be located within the Onshore Substation zone. This area will include the substation buildings and the earthworks to create the platform. The Onshore Substation will comprise up to four buildings. The maximum dimensions of the main building are 20m high, 40m wide and 90m long. Access to the substation will be via a new permanent access road measuring up to 8m wide and 1.2km in length, or 9,600m². The maximum search area for landscape planting around the Onshore Substation is 469,733m². This area includes the footprint of the Onshore Substation, landscape planting and the attenuation pond. Works are expected to take 33-months to complete. The additional plant to be used for the Onshore substations are: Mobile Crane, Flat bed articulated truck, Cherry Pickers (Diesel) (Genie Lift), Rock Breakers/Concrete Munchers, Road Dump Trucks, CAT 320 Excavators, Compressors (Diesel) (Atlas Copco), Piling Rigs, Lighting Towers (Diesel), Road Recycling Skip Trucks, Ready-mix Concrete, Stone Delivery Truck, Teleporter/Forks (JCB), Flat bed articulated truck, Flat Bed/Hiab, Concrete Pumps, HDD Drilling Rig, Bentonite Mixing & Recycling Plant, Plastic Welding Plant (butt fusion welders), Temporary Welfare Facilities (incl. diesel genies), Cable Winches, Cable Drums, Abnormal load trailers- SPMT's. <p>Operations and maintenance phase</p>	

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<ul style="list-style-type: none"> The area that will be subject to permanent loss will be 125,000m² at the substations and the link boxes. In addition, the area of permanent loss from new permanent access road will be 9,600m². The expected lifetime of the Mona Offshore Wind Project is 35 years. <p>Decommissioning phase</p> <p><u>Onshore Cable Corridor works:</u></p> <ul style="list-style-type: none"> The onshore cable and 400kV Grid Connection Cable will remain in situ but the link boxes will be removed. The maximum number of link boxes along the Onshore Cable Corridor is 96 (based on a distance of 750m between each link box on up to four trenches). The area of each link box is up to 6m². Therefore, 636m² of land will need to be disturbed. <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> The Mona Onshore Substation and permanent access road will be removed. As per construction disturbance can be assumed to take place if these activities are within the ZOI of any of the sensitive breeding receptor species screened in for assessment. 	
<p>The impact of habitat fragmentation and species isolation during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.</p>	<p>✓</p>	<p>✓</p> <p>Construction phase</p> <p><u>Open cut trenching at the Landfall:</u></p> <ul style="list-style-type: none"> There will be four trenches. Trenches will be 3m wide at the top and 3m deep, the length of the trench will be 1.5km and it will run between MHWS and MLWS. This will equate to a trench area of 18,000m². In addition, the working areas will extend to 25m at either side. This will equate to a total area of the intertidal that will be subject to works of 306,000m². Works are expected to take up to 33 months to complete. <p><u>Open cut trenching along the Onshore Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent Onshore Cable Corridor is up to 540,000m² based on a corridor measuring 30m wide and 18km in length. The temporary working corridor requires an additional 70m wide corridor (making the total width of the Onshore Cable Corridor (temporary and permanent requirements) 100m wide representing a total area of habitats that will be subject to works of 1,800,000m². This corridor will contain four trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 576m³ of material excavated for the link boxes based on 96 link boxes). There is one haul road within the Onshore Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Haul roads will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400mm and a maximum thickness of 1000mm. Works are expected to take 33-months to complete. <p><u>Open cut trenching along the 400kV Grid Connection Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent 400kV Grid Connection Cable Corridor is up to 48,000m² based on a corridor measuring 16m wide and 3km in length. The temporary working corridor requires an additional 44m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 60m wide representing a total area of habitats that will be subject to temporary works of up to 180,000m². This corridor will contain two trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 60m³ of material excavated for the link boxes based on 10 link boxes). There is one haul road within the 400kV Grid Connection Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Works are expected to take 33-months to complete. <p><u>Construction compounds:</u></p> <ul style="list-style-type: none"> Up to two primary construction compounds (each measuring 150m x 150m) and up to 10 secondary construction compounds (each measuring 150m x 100m) will be located along the Onshore Cable Corridor. The compounds will be located within the Mona Proposed Onshore Development Area. Construction compounds will be prepared by removing and storing soils and then constructing hardstanding areas using crushed stone or other suitable material. 	<p>Construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project may result in the fragmentation of habitat, which may limit population movements and isolate protected or notable species.</p> <p>The use of open cut trenching at the landfall represents the greatest potential for habitat fragmentation. These works may represent a linear barrier alongshore from MHWS.</p> <p>The use of open cut trenching methods along the onshore cable route and 400kV grid connection cable route represent the greatest potential for habitat fragmentation along the Onshore Cable Corridor, and the 440kV Cable Corridor. These corridors will represent a potential temporary linear barrier along the corridor route.</p> <p>The maximum area of the substation represents the greatest potential for permanent fragmentation of habitats during the operational phase of the project.</p> <p>Works to decommission the cable corridor are based upon the haul road being used. This will represent potential for a temporary linear barrier along the corridor route.</p>

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<ul style="list-style-type: none"> These will be in place for the duration of the works (33-months). <p>Operations and maintenance phase</p> <ul style="list-style-type: none"> The expected lifetime of the Mona Offshore Wind Project is 35 years. The substation will be in existence throughout this period. <p>Decommissioning phase</p> <p><u>Onshore Cable Corridor works:</u></p> <ul style="list-style-type: none"> The onshore cable and 400kV Grid Connection Cable will remain in situ but the link boxes will be removed. The maximum number of link boxes along the Onshore Cable Corridor is 96 (based on a distance of 750m between each link box on up to four trenches). The area of each link box is up to 6m². Therefore, 636m² of land will need to be disturbed. <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> The Mona Onshore Substation and permanent access road will be removed. 	
<p>The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Mona Offshore Wind Project.</p>	<p>✓ × ✓</p>	<p>Construction phase</p> <p><u>Open cut trenching at the Landfall:</u></p> <ul style="list-style-type: none"> There will be four trenches. Trenches will be 3m wide at the top and 3m deep, the length of the trench will be 1.5km and it will run between MHWS and MLWS. This will equate to a trench area of 18,000m². In addition, the working areas will extend to 25m at either side. This will equate to a total area of the intertidal that will be subject to works of 306,000m². Works are expected to take up to 33 months to complete. Cable laying and trenching equipment and vessels will be used to install the cable, and vehicles used for transportation and access. These may involve the use of petrol, diesel, hydraulic oil, etc. <p><u>Trenchless techniques at the landfall:</u></p> <ul style="list-style-type: none"> Four Horizontal Directional Drilling cable ducts will need to be installed running 2km between MHWS and MLWS. The total working area for each Horizontal Directional Drilling compound is 100x150m. <p><u>Open cut trenching along the Onshore Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent Onshore Cable Corridor is up to 540,000m² based on a corridor measuring 30m wide and 18km in length. The temporary working corridor requires an additional 70m wide corridor (making the total width of the Onshore Cable Corridor (temporary and permanent requirements) 100m wide representing a total area of habitats that will be subject to works of 1,800,000m². This corridor will contain four trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 576m³ of material excavated for the link boxes based on 96 link boxes). There is one haul road within the Onshore Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Haul roads will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400mm and a maximum thickness of 1000mm. Works are expected to take 33-months to complete. Cable laying and trenching equipment will be used to install the cable, and vehicles used for transportation and access. These may involve the use of petrol, diesel, hydraulic oil, etc. <p><u>Open cut trenching along the 400kV Grid Connection Cable Corridor:</u></p> <ul style="list-style-type: none"> The area of the permanent 400kV Grid Connection Cable Corridor is up to 48,000m² based on a corridor measuring 16m wide and 3km in length. The temporary working corridor requires an additional 44m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 60m wide representing a total area of habitats that will be subject to temporary works of up to 180,000m². This corridor will contain two trenches. The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 60m³ of material excavated for the link boxes based on 10 link boxes). There is one haul road within the 400kV Grid Connection Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. 	<p>Activities required for the construction and decommissioning of the Mona Offshore Wind Project may result in accidental spills/contaminant release which could adversely affect protected or notable habitats and species.</p> <p>The use of open cut trenching at the landfall represents the greatest area for construction and therefore also represents the greatest threat of contamination as spills would be easier to contain in a smaller area.</p> <p>The use of open cut trenching along the Onshore Cable Corridor and 440kV Corridor represents the greatest area for construction and therefore also represents the greatest threat of contamination as spills would be easier to contain in a smaller area.</p> <p>The maximum area of the substation, permanent road, and construction compounds represent the greatest area for potential contamination.</p> <p>The maximum area of decommissioning represents the greatest area for potential contamination.</p>

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<ul style="list-style-type: none"> • Works are expected to take 33-months to complete. • Cable laying and trenching equipment will be used to install the cable, and vehicles used for transportation and access. These may involve the use of petrol, diesel, hydraulic oil, etc. <p><u>Trenchless techniques:</u></p> <ul style="list-style-type: none"> • The maximum number of HDD locations along the Onshore Cable Corridor is 72 and 12 for the 400kV Grid Connection Cable Corridor. Primary HDD operations will require a compound, these will measure up to 150m x 100m. Secondary HDDs will require a smaller compound (measuring up to 30m x 20m) and will be located within the 100m temporary construction corridor. • HDD equipment will be used to install the cable, and vehicles used for transportation and access. These may involve the use of petrol, diesel, hydraulic oil, etc. <p><u>Construction compounds:</u></p> <ul style="list-style-type: none"> • Up to two primary construction compounds (each measuring 150m x 150m) and up to 10 secondary construction compounds (each measuring 150m x 100m) will be located along the Onshore Cable Corridor. The compounds will be located within the Mona Proposed Onshore Development Area. • Construction compounds will be prepared by removing and storing soils and then constructing hardstanding areas using crushed stone or other suitable material. • These will be in place for the duration of the works (33-months). <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> • The maximum footprint of the Onshore Substation will measure up to 125,000m² and will be located within the Onshore Substation zone. This area will include the substation buildings and the earthworks to create the platform. The Onshore Substation will comprise up to four buildings. The maximum dimensions of the main building are 20m high, 40m wide and 90m long. • Access to the substation will be via a new permanent access road measuring up to 8m wide and 1.2km in length, or 9,600m². • The maximum search area for landscape planting around the Onshore Substation is 469,733m². This area includes the footprint of the Onshore Substation, landscape planting and the attenuation pond. • Works are expected to take 33-months to complete. • Equipment and vehicles used during construction may involve the use of petrol, diesel, hydraulic oil, etc. <p>Decommissioning phase</p> <p><u>Onshore Cable Corridor works:</u></p> <ul style="list-style-type: none"> • The onshore cable and 400kV Grid Connection Cable will remain in situ but the link boxes will be removed. • The maximum number of link boxes along the Onshore Cable Corridor is 96 (based on a distance of 750m between each link box on up to four trenches). • The area of each link box is up to 6m². Therefore, 636m² of land will need to be disturbed. <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> • The Mona Onshore Substation and permanent access road will be removed. • Similar contaminants may be stored for decommissioning as per construction. 	
<p>The impact of spreading Invasive and Non-native Species (INNS) during construction and decommissioning of the Mona Offshore Wind Project.</p>	<p>✓</p>	<p>×</p> <p>✓</p> <p>Construction phase</p> <p><u>Open cut trenching along the Onshore Cable Corridor:</u></p> <ul style="list-style-type: none"> • The area of the permanent Onshore Cable Corridor is up to 540,000m² based on a corridor measuring 30m wide and 18km in length. The temporary working corridor requires an additional 70m wide corridor (making the total width of the Onshore Cable Corridor (temporary and permanent requirements) 100m wide representing a total area of habitats that will be subject to works of 1,800,000m². This corridor will contain four trenches. • The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 576m³ of material excavated for the link boxes based on 96 link boxes). • There is one haul road within the Onshore Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. Haul roads will be constructed using imported engineered granular fill with geotextile style layers 	<p>Construction and decommissioning of the Mona Offshore Wind Project may cause the spread of INNS, which could adversely affect the status of native protected or notable habitats and species.</p> <p>The use of open cut trenching methods along the onshore cable route and 400kV grid connection cable route represent the greatest potential for spreading INNS. The maximum area required for the construction of the Onshore Cable Corridor, 400kV Grid Connection Cable, and the associated infrastructure represents the maximum area that INNS can be spread.</p>

Potential impact	Phase ^a	Maximum Design Scenario	Justification
		<p>with a nominal thickness of 400mm and a maximum thickness of 1000mm.</p> <ul style="list-style-type: none"> • Works are expected to take 33-months to complete. <p><u>Open cut trenching along the 400kV Grid Connection Cable Corridor:</u></p> <ul style="list-style-type: none"> • The area of the permanent 400kV Grid Connection Cable Corridor is up to 48,000m² based on a corridor measuring 16m wide and 3km in length. The temporary working corridor requires an additional 44m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 60m wide representing a total area of habitats that will be subject to temporary works of up to 180,000m². This corridor will contain two trenches. • The area of each link box is up to 6m² and each link box is up to 1m deep; the volume of material excavated per link box is 6m³ (a total of up to 60m³ of material excavated for the link boxes based on 10 link boxes). • There is one haul road within the 400kV Grid Connection Cable Corridor along the length of the corridor; it is 6m wide excluding passing places. • Works are expected to take 33-months to complete. <p><u>Trenchless techniques:</u></p> <ul style="list-style-type: none"> • The maximum number of HDD locations along the Onshore Cable Corridor is 72 and 12 for the 400kV Grid Connection Cable Corridor. Primary HDD operations will require a compound, these will measure up to 150m x 100m. Secondary HDDs will require a smaller compound (measuring up to 30m x 20m) and will be located within the 100m temporary construction corridor. <p><u>Construction compounds:</u></p> <ul style="list-style-type: none"> • Up to two primary construction compounds (each measuring 150m x 150m) and up to 10 secondary construction compounds (each measuring 150m x 100m) will be located along the Onshore Cable Corridor. The compounds will be located within the Mona Proposed Onshore Development Area. • Construction compounds will be prepared by removing and storing soils and then constructing hardstanding areas using crushed stone or other suitable material. • These will be in place for the duration of the works (33-months). <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> • The maximum footprint of the Onshore Substation will measure up to 125,000m² and will be located within the Onshore Substation zone. This area will include the substation buildings and the earthworks to create the platform. The Onshore Substation will comprise up to four buildings. The maximum dimensions of the main building are 20m high, 40m wide and 90m long. • Access to the substation will be via a new permanent access road measuring up to 8m wide and 1.2km in length, or 9,600m². • The maximum search area for landscape planting around the Onshore Substation is 469,733m². This area includes the footprint of the Onshore Substation, landscape planting and the attenuation pond. • Works are expected to take 33-months to complete. <p>Decommissioning phase</p> <p><u>Onshore Cable Corridor works:</u></p> <ul style="list-style-type: none"> • The onshore cable and 400kV Grid Connection Cable will remain in situ but the link boxes will be removed. • The maximum number of link boxes along the Onshore Cable Corridor is 96 (based on a distance of 750m between each link box on up to four trenches). • The area of each link box is up to 6m². Therefore, 636m² of land will need to be disturbed. <p><u>Onshore Substation:</u></p> <ul style="list-style-type: none"> • The Mona Onshore Substation and permanent access road will be removed. 	<p>The maximum area required for the construction of the Onshore Substation and permanent access road represents the maximum area that INNS can be spread.</p> <p>The Onshore Cable Corridor and 400kV grid connection cable shall remain in situ in decommissioning phase with only the link boxes needing removal. The maximum area of these plus the area of the haul road (assumed for access) represents the maximum area that INNS can be spread.</p>

24.5.5 Impacts scoped out of the assessment

24.5.5.1 On the basis of the baseline environment and the description of development outlined in volume 1, chapter 3: Project description of the PEIR, a number of impacts are proposed to be scoped out of the assessment for the onshore and intertidal ornithology. These impacts are outlined, together with a justification for scoping them out, in Table 24.22.

Table 24.22: Impacts scoped out of the assessment for the onshore and intertidal ornithology.

Potential impact	Justification
The impact of pollution caused by accidental spills/contaminant release on protected habitats and species during operations and maintenance of the Mona onshore transmission assets.	Activities associated with the operations and maintenance of the Mona onshore transmission assets are unlikely to result in accidental spills/contaminant release. Therefore, the potential impact of pollution on protected habitats and species arising from accidental spills/contaminant release during operations and maintenance of the Mona onshore transmission assets is unlikely to be significant and is proposed to be scoped out of the assessment for terrestrial ecology and intertidal birds.
The impact of construction, operations and maintenance and decommissioning of the Mona onshore transmission assets on species not listed in the EIA Scoping Report.	As part of the site selection and route refinement process, the Mona onshore transmission assets would be located and designed to avoid large parcels of woodland and main watercourses. Where the onshore export cable is required to cross larger watercourses, environmentally sensitive construction techniques would be used (e.g. horizontal directional drilling) to avoid or reduce potential impacts on habitats and species. In addition, due to the limited extent and temporary nature of habitat disturbance associated with construction and decommissioning of the onshore export cable, and the requirement for land to be reinstated post- construction, significant impacts on species not listed in the EIA Scoping Report are unlikely to occur and are proposed to be scoped out of the assessment for terrestrial ecology and intertidal birds. However, should it not be feasible to utilise environmentally sensitive construction techniques (e.g. horizontal directional drilling), the list of survey requirements and species to be considered in the assessment for terrestrial ecology and intertidal birds will be reassessed.

24.6 Measures adopted as part of the Mona Offshore Wind Project

24.6.1.1 As part of the project design process a number of tertiary measures adopted as part of the Mona Offshore Wind Project have been proposed to reduce the potential for impacts on intertidal and onshore valued ornithological receptors (section 24.4.4 Table 24.23). No primary or secondary measures have been adopted. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Mona Offshore Wind Project and have therefore been considered in the assessment presented in section 24.7 below (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development.

Table 24.23: Tertiary measures adopted as part of the Mona Offshore Wind Project to meet legislative requirements or standard industry practice.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Outline Code of Construction Practice (CoCP)	Measures to minimise potential contaminant releases and manage construction impacts	Proposed to be secured through a requirement of the DCO
Pre-commencement breeding bird surveys	Pre-commencement breeding bird surveys to specifically identify the potential nesting location of VORs of high conservation importance	
Ecological Clerk of Works (ECoW)	The deployment of a suitably qualified ECoW during construction activities	
Hydrology, Ecology and Landscape Management Plan	To include a Breeding Bird Protection Plan	

24.7 Assessment of significant effects

24.7.1.1 The impacts of the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project have been assessed for onshore and intertidal ornithology. The potential impacts arising from the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project are listed in Table 24.21, along with the MDS against which each impact has been assessed.

24.7.1.2 A description of the potential effect on VORs caused by each identified impact is given below.

24.7.2 The impact of temporary and permanent habitat loss during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

24.7.2.1 Construction and decommissioning of the Mona Offshore Wind Project may result in the temporary (e.g. Mona Onshore Cable Corridor) or permanent (e.g. Mona Onshore Substation) loss of habitat, which may support protected or notable species. The MDS is represented by the maximum surface area of habitat loss and disturbance and is summarised in Table 24.21.

24.7.2.2 Construction within the Mona Proposed Onshore Development Area has the potential to impact: seabirds foraging in nearshore waters; waders foraging in the intertidal zone between MHWS and MLWS and breeding birds either nesting and/or foraging onshore in the Mona Proposed Onshore Development Area.

24.7.2.3 During operation and maintenance, permanent loss of habitats associated with the Mona Onshore Substation and associated access roads are inland and away from

any suitable foraging and/or resting habitat for seabird and waterbird VORs. Thus, they will not be affected by the permanent habitat loss. However, this permanent habitat loss during the operations and maintenance phase does have the potential to impact onshore breeding birds (e.g. passerines and bird of prey).

Seabird VORs

24.7.2.4 Seabirds may be indirectly disturbed and displaced during the construction, operations and maintenance and decommissioning phase because of direct impacts on habitat, which may result in the temporary loss of a food resource to birds along the Mona Proposed Onshore Development Area. As a result, displaced seabirds may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). The temporary habitat loss may lead to a short-term avoidance of affected areas that support fish and shellfish species on which seabird VORs prey upon.

Waterbird ornithological VORs

24.7.2.5 The impact of construction, operations and maintenance and decommissioning is likely to result in the temporary removal of habitat that support foraging and roosting waders, including Eurasian oystercatcher, common ringed plover, Eurasian curlew and common redshank all of which have been recorded foraging and roosting in the ornithology intertidal study area. Temporary removal of intertidal habitats may impact upon the availability of macroinvertebrates and foraging waders may need to forage elsewhere to meet their daily energy requirement. Displaced waders may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). Such resulting displacement could ultimately affect their demographic fitness (i.e. survival rates and breeding productivity) as well as potentially impacting on other birds in areas that displaced birds move to.

Onshore breeding bird VORs

24.7.2.6 As terrestrial habitats may provide different functions for breeding birds (foraging, non-foraging activities and nesting), there is a potential for the abundance and distribution to be locally affected by temporary or permanent habitat loss. Although birds may continue to breed in the area, temporary or permanent habitat loss could ultimately affect their demographic fitness (i.e. survival rates and breeding productivity). Furthermore, the fitness of displaced birds (e.g. birds nesting in areas of permanent habitat loss) may be affected as birds may move to areas already occupied by birds or into breeding areas of lower quality.

Construction and decommissioning

Magnitude of impact

Seabird VORs

24.7.2.7 In the absence of quantitative published evidence which would be required to examine the impact of displacement on individual seabirds survival and/or productivity and their population size, the magnitude of the impact is considered qualitatively for seabird VORs.

24.7.2.8 Whilst temporary habitat loss as the result of cable construction and decommissioning may lead to a temporary avoidance of the affected areas, the impact at the population-level is undetectable given that displaced birds may re-locate to other areas to meet their daily energy requirement. Furthermore, it is anticipated that the effects of the construction and decommissioning phases upon the supporting habitats will be reversible.

24.7.2.9 Moreover, the temporary loss of habitat is considered to be negligible in context of the habitats available to support the seabird VORs in the Liverpool Bay/Bae Lerpwl SPA. It must be noted that seabird VORs are widely distributed in the inshore areas of the Liverpool Bay/Bae Lerpwl SPA and show a high degree of flexibility in habitat use (Wade *et al.*, 2016).

24.7.2.10 The impact is therefore predicted to be of local spatial extent, short term duration, intermittent and highly reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Waterbird VORs

24.7.2.11 In the absence of quantitative information available, the magnitude of the impact is considered qualitatively for waterbird VORs.

24.7.2.12 Whilst temporary habitat loss as the result of cable construction and decommissioning may lead to a temporary avoidance of the affected areas, the impact at the population-level is undetectable given that displaced birds may re-locate to other areas to meet their daily energy requirement. Furthermore, it is anticipated that the effects of the construction phase upon the supporting habitats will be reversible.

24.7.2.13 The impact is therefore predicted to be of local spatial extent, short term duration, intermittent and highly reversible. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Onshore terrestrial breeding VORs

24.7.2.14 The construction of the Mona Offshore Wind Project has the potential to impact breeding birds due to habitat loss, predominantly affecting ground nesting farmland birds in grassland/pasture habitat, or passerine and raptor species nesting in hedgerows, and woodland. Grassland/pasture of low ornithological value is the dominant habitat type (63.5%) along the Mona Onshore Ornithology study area, with deciduous or mixed woodland taking up 9%.

24.7.2.15 Whilst temporary habitat loss as the result of cable construction and decommissioning may lead to a temporary avoidance of the affected areas, the impact at the population-level is undetectable for the breeding VORs with the adoption of tertiary measures outlined in Table 24.23. At the sub-station locations there is no overlap of breeding territories with the proposed substation. As such, the abundance and distribution of little ringed plover and red kite will not be affected by the removal of habitats.

24.7.2.16 The impact is therefore predicted to be of local spatial extent, short term duration, intermittent and highly reversible. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

Seabird VORs

24.7.2.17 Although most seabirds are flexible in their habitat use during the non-breeding season, they are considered to be very vulnerable to the loss of foraging grounds.

24.7.2.18 Seabird VORs are deemed to be of high vulnerability, medium recoverability and high to very high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

Waterbird VORs

24.7.2.19 Waterbird and in particular waders are considered to be very vulnerable to the loss of foraging habitats on their wintering grounds.

24.7.2.20 Waterbird VORs are deemed to be of high vulnerability, medium recoverability and high to very high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

Onshore breeding bird VORs

24.7.2.21 Habitat loss is one of the greatest threats to breeding birds and the breeding VORs are considered to be highly vulnerable to the loss of habitats, which is suitable for nesting.

24.7.2.22 Breeding VORs are deemed to be of high vulnerability, medium recoverability and high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of the effect

24.7.2.23 The significance of effect for each identified impact is assessed by correlating the magnitude of the impact and the sensitivity of the receptor. For each of the species VOR groupings; seabird species, intertidal waterbirds, onshore breeding birds and onshore wintering birds, the significance of effect for each species is detailed in Table 24.24, Table 24.25 and Table 24.26 respectively.

Table 24.24: Table summarising the significance of effect during construction of temporary or permanent habitat loss on seabird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Common scoter	Negligible	High	Minor adverse, not significant in EIA terms
Red-throated diver	Negligible	High	Minor adverse, not significant in EIA terms
Red-breasted merganser	Negligible	High	Minor adverse, not significant in EIA terms
Great cormorant	Negligible	High	Minor adverse, not significant in EIA terms

Table 24.25: Table summarising the significance of effect during construction of temporary or permanent habitat loss on waterbird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Eurasian oystercatcher	Negligible	High	Minor adverse, not significant in EIA terms
Eurasian curlew	Negligible	High	Minor adverse, not significant in EIA terms
Common redshank	Negligible	High	Minor adverse, not significant in EIA terms
Ringed Plover	Negligible	High	Minor adverse, not significant in EIA terms

Table 24.26: Table summarising the significance of effect during construction of temporary or permanent habitat loss on onshore breeding bird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Red kite	Negligible	High	Minor adverse, not significant in EIA terms
Little ringed plover	Negligible	High	Minor adverse, not significant in EIA terms

Operation and maintenance

Magnitude of impact

Onshore breeding bird VORs

24.7.2.24 There is no overlap of breeding territories with the proposed sub-station in the Mona Proposed Onshore Development Area. As such, the abundance and distribution of little ringed plover and red kite will not be affected by the permanent loss of habitats.

24.7.2.25 The impact is therefore predicted to be none. The magnitude is therefore, considered to be **no change**.

Sensitivity of the receptor

Onshore breeding bird VORs

24.7.2.26 Habitat loss is one of the greatest threats to breeding birds and the breeding VORs are considered to be highly vulnerable to the loss of habitats, which are suitable for nesting.

24.7.2.27 Breeding VORs are deemed to be of high vulnerability, medium recoverability, and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of the effect

Onshore breeding bird VORs

24.7.2.28 The significance of effect for each identified impact is assessed by correlating the magnitude of the impact and the sensitivity of the receptor. For onshore breeding birds the significance of effect for each species is detailed in Table 24.27.

Table 24.27: Table summarising the significance of effect during operation and maintenance of temporary or permanent habitat loss on onshore breeding bird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Red kite	No change	High	No change, not significant in EIA terms
Little ringed plover	No change	High	No change, not significant in EIA terms

24.7.3 The impact of habitat disturbance during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

24.7.3.1 For ornithological receptors the impact of habitat disturbance has been considered to be the disturbance from habitats used by birds throughout their daily cycle (i.e. resting and foraging etc) and life cycle (i.e. breeding and non-breeding). This disturbance impact may arise from physical, visible and audible stimuli which are considered in the below assessment.

24.7.3.2 Construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project may result in the disturbance of habitat (e.g. movement, noise, light spill, vibration), which may support protected or notable species. The MDS is represented by the maximum number of vehicles (including heavy machinery) and personnel that could cause the greatest impact and is summarised in Table 24.21.

24.7.3.3 Construction at the Mona Proposed Onshore Development Area has the potential to impact: seabirds foraging or loafing in nearshore waters; waders foraging or loafing in the intertidal zone between MHWS and MLWS and breeding birds nesting and/or foraging.

Seabird VORs

24.7.3.4 Seabirds may be indirectly disturbed and displaced during the construction and decommissioning phase of the Mona Offshore Wind Project. The potential for displacement of individual birds either foraging or loafing in nearshore waters may result from the physical presence and/or noise disturbance associated with construction works and the presence of machinery and personnel where work is occurring, including construction works in the intertidal area. Displaced seabirds may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability).

24.7.3.5 The temporary habitat loss may lead to a short-term avoidance of affected areas that support fish and shellfish species on which seabird VORs prey upon. Such disturbance and resulting displacement could ultimately affect their demographic fitness (i.e. survival rates and breeding productivity) as well as potentially impacting on other birds in areas that displaced birds move to.

Waterbird VORs

24.7.3.6 The impact of construction, operations and maintenance and decommissioning is likely to result in habitat disturbance in areas that support foraging and roosting waders, including Eurasian oystercatcher, common ringed plover, Eurasian curlew and common redshank all of which have been recorded foraging and roosting in the ornithology intertidal study area.

24.7.3.7 Construction works in the intertidal zone involves the physical, visible and audible presence of trenching machinery, installation vessels and personnel. This has the potential to result in the displacement from the construction area of most, if not all, species that would feed, loaf, or roost in the intertidal zone during the period of construction activity. Such disturbance may also impact upon the foraging extent and availability of macroinvertebrates preyed upon by foraging waders which may be displaced and need to seek alternate foraging habitat to meet their daily energy requirement. Displaced waders may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). Such resulting displacement could ultimately affect their demographic fitness (i.e. survival rates and breeding productivity) as well as potentially impacting on other birds in areas that displaced birds move to.

24.7.3.8 Whilst a single disturbance event is unlikely to have a material impact or immediate effect on an individual's ability to survive or longer term to be reproductively successful, repetitive, and sustained disturbance events have the potential to impact survival and productivity.

Onshore breeding bird VORs

24.7.3.9 Breeding birds may be directly or indirectly disturbed and displaced during the construction operations and maintenance and decommissioning phase of the Mona Offshore Wind Project. There is the potential for birds at various stages of the breeding cycle (i.e. pairing, nest building, egg laying and chick rearing) to be disturbed either by the physical presence and/or noise disturbance associated with the construction works and the presence of machinery and personnel where work is occurring.

24.7.3.10 Disturbance resulting from noise may impact birds' ability to pair during courtship, for example, if the noise created inhibits the song of singing males being audible to potential female mates. Disturbance events also have the potential to cause breeding birds to abandon nesting attempts and/or similarly reduce the foraging habitat available if they avoid and are displaced from those habitats and thereby reduce the potential food resources available for both adult breeding birds and the feeding of chicks. Disturbance and displacement therefore have the potential to impact breeding birds' productivity, if alternate nesting and foraging habitats are not available or are occupied by other breeding individuals at sufficiently high density levels which limit the support of additional breeding pairs.

Construction phase

Magnitude of impact

Seabird VORs

24.7.3.11 Assuming a seaward ZOI of 1,000m for red-throated diver and common scoter (Goodship and Fellows, 2022), 2,627,500m² of habitat will be subject to potential disturbance. In the context of Bae Lerpwl/Liverpool Bay SPA which is designated for common scoter and red-throated diver, this represents a small area of the total habitat. In the absence of quantitative information available the magnitude of the impact is considered qualitatively for seabirds for which change at a population level, resulting from temporary displacement is not considered to be detectable. This area of construction and works associated with the landfall is contiguous to the Liverpool Bay/Bae Lerpwl SPA and the work is considered to be of local spatial extent and short-term duration.

24.7.3.12 The impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Waterbird VORs

24.7.3.13 Assuming a ZOI of 300m (Goodship and Furness, 2022; Cutts, *et al.*, 2013; Laursen *et al.*, 2005), 976,500m² of habitat will be subject to potential disturbance.

24.7.3.14 Waders recorded in the ornithology intertidal study area are likely to be faithful to foraging and roosting habitats. Whilst the disturbance has the potential to affect survival during the non-breeding season, the overall impacts of the construction work are undetectable at a population level. Indeed, habitat disturbance will be localised and displaced birds from the construction work activity will be able to feed in other areas within the intertidal ornithology study area.

24.7.3.15 Increasing evidence has shown that wader species will feed both diurnally and nocturnally and throughout the tidal cycle to maximise their daily food intake and take advantage of foraging opportunities, night, or day (Dugan *et al.*, 1981; Mander *et al.*, 2022). Evidence of nocturnal foraging has been observed in the intertidal ornithology study area during nocturnal surveys undertaken and detailed in Volume 7, annex 24.2: Intertidal ornithology technical report of the PEIR.

24.7.3.16 Given the evidence available it is anticipated wader species foraging or loafing in the intertidal area will be displaced during construction activity, however that this displacement will be local in extent and limited to within around 300m of any activity (Goodship & Furness, 2022; Cutts, *et al.*, 2013; Laursen *et al.*, 2005). Furthermore, the resulting disturbance from construction activity is only anticipated to occur whilst construction works are actively being undertaken, therefore limiting the magnitude and extent of any potential impact of disturbance and displacement.

The impact is predicted to be of local spatial extent, short/medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Onshore breeding bird VORs

24.7.3.17 The three red-kite territory locations are all contained within discrete woodland areas, each outside the immediate Mona Proposed Onshore Development Area but

located within the 250m buffer surrounding the onshore ornithology study area. To lower the impact upon this species, pre-commencement breeding bird checks will be undertaken, and if necessary, a Breeding Bird Protection Plan drafted.

24.7.3.18 The single little ringed plover nest recorded is sited on disused open ground. The broken ground, gravel and low-lying vegetation provided by this former industrial area offers ideal habitat for little ringed plover to nest. The area used to nest is outside of the Mona Proposed Onshore Development Area, but within the 250m buffer of the onshore ornithology study area. To lower the impact upon this species, pre-commencement breeding bird checks will be undertaken, and if necessary a Breeding Bird Protection Plan drafted.

24.7.3.19 For red kite and little ringed plover, the impact is predicted to be of local spatial extent, short/medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

Seabird VORs

24.7.3.20 Of the four seabird VORs red-throated diver and common scoter are known to be the most sensitive to disturbance and to be displaced by various marine industry activities, including construction and operation of offshore wind farms and/or marine vessels (Heinenan *et al.*, 2020, Wade *et al.*, 2016). Whilst red-throated diver and common scoter are known to be sensitive to disturbance their vulnerability and their recoverability to the impact of disturbance either individually or at a population level is not known. Therefore, the consequences of displacement for individuals and impact on the population are unknown (Dierschke *et al.*, 2017).

24.7.3.21 Whilst red-throated divers appear capable of utilising a range of marine habitats and prey species, they also tend to occur at relatively low densities and not in large aggregations. Consequently, reduced prey intake caused by increased density-dependent competition or interference would seem unlikely. Red-throated divers are highly mobile in winter which may mean they are able to find alternative foraging sites following displacement. However, individuals tend to be relatively site faithful in winter and in their choice of staging/moulting areas (even though there is large variation among individuals in choice of site).

24.7.3.22 For the purposes of this assessment and on a precautionary basis the vulnerability for red-throated diver, common scoter, and red-breasted merganser has been considered to be high and the vulnerability of great cormorant which is relatively less sensitive to disturbance than the rest of the VORs has been considered to be medium.

24.7.3.23 The receptors are considered to have medium recoverability based on their relatively low reproductive success and a stable or slightly decreasing trend in the numbers of wintering birds. The receptors are considered to be of high conservation importance

24.7.3.24 Red-throated diver, common scoter and red-breasted merganser are of high vulnerability, medium recoverability and very high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

24.7.3.25 Great cormorant are less sensitive to disturbance and therefore of medium vulnerability, medium recoverability and very high conservation importance. The sensitivity of these receptors is therefore considered to be **high**.

Waterbird VORs

24.7.3.26 Wader species are known to be sensitive to disturbance events resulting from either noise or visual activity and the presence of humans (Cutts *et al.*, 2009; Wright *et al.*, 2010).

24.7.3.27 Visual stimuli tend to generate behavioural responses in waterbirds before audible noise stimuli can take an effect, since the Flight Initiation Distance (FID) in most species to a visual disturbance cue, is often between 75m and 150m (Cutts and Hemmingway, 2021). However, some species are more sensitive than others to disturbance with flight response (escape) distances described by Laursen *et al.* (2005), varying from 300m for Eurasian curlew at the upper end to 42m for ringed plover at the lower end. Therefore, as a precaution a 300m radius has been used for visual stimuli (e.g. based on a broadly worst-case FID range for waterbirds (Cutts *et al.*, 2008)). In relation to audible Sound Pressure Levels (SPL) Cutts & Hemingway (2012) concluded that as a precautionary value, a 70dB(A) at receptor threshold would be appropriate in most instances, with few behavioural responses noted below this level, and indeed many species tolerant of levels well above this.

24.7.3.28 Eurasian Oystercatcher, Eurasian curlew, common redshank and common ringed plover are deemed to be of high vulnerability, medium recoverability and very high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

Onshore breeding bird VORs

24.7.3.29 Despite red kites' apparent tolerance to humans, red kites are still potentially sensitive to disturbance. Goodship and Fellows (2022) assessed red kite as being of medium sensitivity to disturbance, with a suggested ZOI of up to 300m from the nest site.

24.7.3.30 Red kite have seen a 376% increase over 25 years in Wales (Harris, *et al.*, 2022) and are therefore considered of medium recoverability. Red kites are both a listed Annex 1 species of the EU Birds Directive and a Schedule 1 Species of the Wildlife and Countryside Act (1981) as amended. The species is therefore considered to be of national importance and of high conservation importance.

24.7.3.31 Like other ground nesting wader species little ringed plover is sensitive to disturbance during breeding (Hockin *et al.*, 1992). Whilst there is no data available on disturbance distances for little ringed plover, Goodship and Fellows (2022) classified common ringed plover as of high sensitivity to disturbance with a suggested ZOI of up to 200m.

24.7.3.32 Little ringed plover is considered to have medium recoverability based on their relatively low reproductive success and a stable or increasing UK long-term trend in breeding abundance and productivity. Little ringed plover are a Schedule 1 species of the Wildlife and Countryside Act (1981) as amended. The species is therefore considered to be of national importance and of high conservation importance.

24.7.3.33 Red kite is deemed to be of high vulnerability, medium recoverability and high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

24.7.3.34 Little ringed plover is deemed to be of high vulnerability, medium recoverability and high conservation importance. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of the effect

24.7.3.35 The significance of effect for each identified impact is assessed by correlating the magnitude of the impact and the sensitivity of the receptor. For each of the species VOR groupings; seabird species, intertidal waterbirds, onshore breeding birds and onshore wintering birds, the significance of effect for each species is detailed in tables; Table 24.28, Table 24.29, and Table 24.30 respectively.

Table 24.28: Table summarising the significance of effect during construction of habitat disturbance on seabird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Common scoter	Negligible	High	Minor adverse, not significant in EIA terms
Red-throated diver	Negligible	High	Minor adverse, not significant in EIA terms
Red-breasted merganser	Negligible	High	Minor adverse, not significant in EIA terms
Great cormorant	Negligible	High	Minor adverse, not significant in EIA terms

Table 24.29: Table summarising the significance of effect during construction of habitat disturbance on waterbird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Eurasian oystercatcher	Negligible	High	Minor adverse, not significant in EIA terms
Eurasian curlew	Negligible	High	Minor adverse, not significant in EIA terms
Common redshank	Negligible	High	Minor adverse, not significant in EIA terms
Common ringed Plover	Negligible	High	Minor adverse, not significant in EIA terms

Table 24.30: Table summarising the significance of effect during construction of habitat disturbance on onshore breeding bird VORs.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
Red kite	Negligible	High	Minor adverse, not significant in EIA terms
Little ringed plover	Negligible	High	Minor adverse, not significant in EIA terms

Operations and maintenance

24.7.3.36 The impacts from the operations and maintenance activities within the Mona Proposed Onshore Development Area will be less than those carried out during the construction and decommissioning phases.

Significance of the effect

All receptors

24.7.3.37 Overall, the magnitude of the impact during operations and maintenance is deemed to be negligible and the sensitivity of the receptor is high (see Table 24.28 to Table 24.30). The effect will, therefore, be of **minor** adverse significance, which is not significant in EIA terms.

Decommissioning

24.7.3.38 Decommissioning activities within the Mona Proposed Onshore Development Area are equal to or less than those carried out during the construction phase. Therefore, for the purpose of this assessment it is assumed that the level of disturbance is likely to be similar and the potential impact on each species is deemed to be reversible in the short-term as birds are likely to return when activities have been completed.

Significance of the effect

All receptors

24.7.3.39 Overall, the magnitude of the impact during decommissioning is deemed to be negligible and the sensitivity of the receptor is considered to be high. The effect will, therefore, be of **minor** adverse significance, which is not significant in EIA terms.

24.7.4 The impact of habitat fragmentation and species isolation during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project

24.7.4.1 The construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project has the potential to result in habitat fragmentation and species isolation through creating changes to habitat configuration at a landscape scale. The MDS is based upon the largest footprint of disturbed land and is summarised in Table 24.21.

24.7.4.2 Changes which cause existing habitat to become broken up or fragmented can lead to the isolation of individual species and reduce the individual patch size in which they forage and are ecologically dependent upon and therefore potentially affect their population size and viability.

Construction phase

Magnitude of impact

All receptors

24.7.4.3 The proposed construction of the Mona Offshore Wind Project is planned to occur across predominantly grassland/pasture, intertidal habitats, and areas of woodland

habitat. As a result of construction works, these habitats will not be broken up or changed in their spatial extent and/or distribution and will if necessary be restored. The proportion and location of each habitat will be maintained.

24.7.4.4 The impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore considered to result in **no change**.

Sensitivity of the receptor

All receptors

24.7.4.5 Habitat fragmentation on a landscape scale can be significant if a species population is small and therefore more vulnerable to change locally, and/or if a species population is already fragmented and vulnerable to a loss of connectivity. A loss of connectivity between individuals of a species may affect their ability to pair, breed and be reproductively successful. This vulnerability is increased if a species is relatively immobile, occupies small territories and is unable to move increased distances created between individual patch sizes or territories (Andren, 1994).

24.7.4.6 The ornithological receptors identified within the onshore and intertidal ornithology study areas are of high conservation importance, but all relatively widely distributed species. Each species is relatively mobile throughout both its annual range, migratory movements and/or wintering foraging ranges and/or breeding home range. Consequently, the receptors are not considered to be particularly vulnerable to habitat fragmentation and species isolation at a local scale.

24.7.4.7 The receptors identified are deemed to be of low vulnerability, high recoverability, and high value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of the effect

24.7.4.8 Overall, the magnitude of the impact is deemed to cause no change, and the sensitivity of the receptor is medium. The effect will, therefore, be **no change** and not significant in EIA terms.

Table 24.31: Table summarising the significance of effect during construction of habitat fragmentation and species isolation.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
All receptors	No change	Medium	No change, not significant in EIA terms

Operation and maintenance

1.1.1.1 Operation and maintenance activities within the Mona Proposed Onshore Development Area will be less than those carried out during the construction and decommissioning phases.

Significance of the effect

All receptors

24.7.4.9 Overall, the magnitude of the impact during operation and maintenance is deemed to be no change and the sensitivity of the receptor is medium. The effect will, therefore, be **no change** and not significant in EIA terms.

Decommissioning

24.7.4.10 Decommissioning activities within Mona Proposed Onshore Development Area are equal to or less than those carried out during the construction phase. Therefore, for the purpose of this assessment it is assumed that the risk of habitat fragmentation and species isolation is likely to be similar and the potential impact is deemed result in **no change**.

Significance of the effect

All receptors

24.7.4.11 Overall, the magnitude of the impact during decommissioning is deemed to be no change and the sensitivity of the receptor is medium. The effect will, therefore, be **no change** and not significant in EIA terms.

24.7.5 The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Mona Offshore Wind Project

24.7.5.1 Activities required for the construction and decommissioning of the Mona Offshore Wind Project may result in accidental spills/contaminant release which could adversely affect protected or notable habitats and species. The MDS is represented by the maximum numbers of vehicles and vessels along the cable corridor that would cause the greatest risk of a pollution incident and is summarised in Table 24.21.

24.7.5.2 Seabirds and waterbirds utilising the environment in the vicinity of a pollution incident may be vulnerable to either direct mortality from oil coverage preventing flight for example, or indirectly via a reduction in ability to forage.

Construction phase

Magnitude of impact

All receptors

24.7.5.3 Although the likelihood of a pollution event occurring is low, should an event occur, the impact is predicted to be of local spatial extent, short-duration, intermittent and reversible. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

All receptors

24.7.5.4 Species that spend large amounts of time in the water (e.g. foraging divers and scoters, and pursuit feeders such as auks) or on the sea surface (e.g. seaducks) are considered to be more vulnerable to pollution incidents (such as the accidental release of synthetic compounds, fuels or other substances) than surface feeding species such as gull species. Waders are deemed to be less vulnerable to pollution incidents. Indeed, waders are more flexible in their habitat use during the non-breeding season and are known to use both terrestrial and intertidal habitats in winter.

24.7.5.5 The receptors are considered to have medium recoverability based on their relatively low reproductive success and a stable or slightly decreasing trend in the UK population. The receptors are considered to be of high conservation importance.

24.7.5.6 The receptors are deemed to be of medium to vulnerability, medium recoverability and high conservation value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of the effect

24.7.5.7 The correlation of negligible magnitude and medium sensitivity of the receptor concludes a negligible/minor significance of the impact as described in Table 24.20. Whilst the magnitude of impact is predicted to be local spatial extent, short-duration, intermittent and reversible, there is no evidence considering the impact of pollution caused by accidental spills/contaminant release on bird populations at this scale. Therefore, on a precautionary basis and in the absence of evidence the significance of the impact has been deemed **minor**.

Table 24.32: Table summarising the significance of effect during construction of pollution caused by accidental spills/containment release.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
All receptors	Negligible	Medium	Minor, not significant in EIA terms

Decommissioning

24.7.5.8 Decommissioning activities within the Mona Proposed Onshore Development Area are equal to or less than those carried out during the construction phase. Therefore, for the purpose of this assessment it is assumed that the risk of pollution caused by accidental spills/contaminant release is likely to be similar and the potential impact is deemed to be reversible in the short-term as birds are likely to return after the pollution incident.

Significance of the effect

All receptors

24.7.5.9 Overall, the magnitude of the impact is deemed to be negligible, and the sensitivity of the receptors is considered to be medium. The effect will, therefore, be of **negligible** adverse significance, which is not significant in EIA terms.

24.7.6 The impact of spreading INNS during construction and decommissioning of the Mona Offshore Wind Project

24.7.6.1 Construction and decommissioning of the Mona Offshore Wind Project may cause the spread of INNS, which could adversely affect the status of native protected or notable habitats and species. The MDS is represented by the greatest amount of land that will be disturbed and is summarised in Table 24.21.

24.7.6.2 Construction and decommissioning activities potentially involve the introduction and/or spread of INNS through the movement of earth during works, including the digging of trenches and the use of machinery and presence of operating personnel. Both machinery and operating personnel have the potential to carry on their equipment (e.g. heavy machinery tracks or vehicle tyres or working clothing, e.g. boots) seeds, or spores of INNS from either within or outside the Mona Proposed Onshore Development Area.

24.7.6.3 The introduction, or unintentional spread of seeds, spores or other parts of plant material may result in the spread of plant species (e.g. Himalayan balsam *Impatiens glandulifera*, giant hogweed *Heracleum mantegazzianum* and water primrose *Ludwigia peploides*). These species have the potential to displace native species and to potentially replace or become dominant in those areas of habitat and change the community composition and structure.

24.7.6.4 If wide scale habitat changes result from the spread of invasive and/or non-native species there is the potential to replace existing valuable habitat and supporting ecosystems that are used by birds for foraging or nesting with less valuable habitats which could limit the bird's ability to survive or be productive.

Construction phase

Magnitude of impact

All receptors

24.7.6.5 The Mona Proposed Onshore Development Area is dominated by ornithologically impoverished habitats of grassland/pasture, 63.5%, arable land 9%, built environment 6.6%, as described in volume 7, annex 24.3: Onshore ornithology breeding birds technical report of the PEIR. These habitats are not likely to be vulnerable to large scale habitat change resulting from changes in plant species composition as a consequence of the spread of native or non-native plant species.

24.7.6.6 Water courses or bodies are more susceptible to the spread of invasive or non-native species, including curly waterweed *Lagarosiphon major* and floating pennywort *Hydrocotyle ranunculoides*, however these habitats are far less abundant in the Mona Proposed Onshore Development Area with ponds only comprising 0.1% of the habitat present.

24.7.6.7 The impact is predicted to be of local spatial extent, short/medium term duration, and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity

24.7.6.8 Each of the VORs is of high conservation importance and are vulnerable to habitat loss or change.

24.7.6.9 The receptors are deemed to be of medium to vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of the effect

24.7.6.10 The correlation of negligible magnitude and medium sensitivity of the receptor concludes a negligible/minor significance of the impact when described in Table 24.20. Whilst the magnitude of impact is predicted to be local spatial extent, short/medium term duration, and high reversibility, there is no evidence considering the impact of spreading INNS on bird populations at this scale. Therefore, on a precautionary basis and in the absence of evidence the significance of the impact has been deemed **minor**.

All receptors

Table 24.33: Table summarising the significance of effect during construction caused by the spreading of INNS.

Species	Magnitude of impact	Sensitivity of receptor	Significance of effect
All receptors	Negligible	Medium	Minor, not significant in EIA terms

Decommissioning

24.7.6.11 Decommissioning activities within the Mona Proposed Onshore Development Area are equal to or less than those carried out during the construction phase. Therefore, for the purpose of this assessment it is assumed that the level of disturbance is likely to be similar and the potential impact on each species is deemed to be reversible in the short-term as birds are likely to return when activities have been completed.

Significance of the effect

All receptors

24.7.6.12 Overall, the magnitude of the impact during decommissioning is deemed to be negligible and the sensitivity of the receptor is considered to be medium to high, depending on the species. The effect will, therefore, be of **negligible or minor** adverse significance, which is not significant in EIA terms.

24.8 Cumulative effect assessment methodology

24.8.1 Methodology

24.8.1.1 The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Mona Offshore Wind Project together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see volume 5, annex 5.1: CEA screening matrix). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

24.8.1.2 The onshore and intertidal ornithology CEA methodology has followed the methodology set out in volume 1, chapter 5: EIA methodology of the PEIR. As part of the assessment, all projects and plans considered alongside the Mona Offshore Wind Project have been allocated into 'tiers' reflecting their current stage within the planning and development process, these are listed below.

24.8.1.3 A tiered approach to the assessment has been adopted using the following categories:

- Tier 1: the Mona Offshore Wind Project considered alongside:
 - Under construction
 - Permitted application
 - Submitted application
 - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an evidenced ongoing impact
- Tier 2: the Mona Offshore Wind Project considered alongside Tier 1 project, as well as projects where the:
 - Scoping report has been submitted and is in the public domain
- Tier 3: the Mona Offshore Wind Project considered alongside Tier 1 and Tier 2 projects, as well as projects where the:
 - Scoping report has not been submitted
 - Identified in a relevant development plan
 - Identified in other plans and programmes.

24.8.1.4 This tiered approach is adopted to provide a clear assessment of the Mona Offshore Wind Project alongside other projects, plans and activities.

24.8.1.5 The specific projects, plans and activities scoped into the CEA, are outlined in Table 24.34.

24.8.1.6 National Grid Electricity Transmission (NGET) are proposing to undertake upgrades to their Bodelwyddan substation; to facilitate the connection of multiple projects (e.g. Awel Y Mor). The upgrades will comprise works to the existing substation, an extension to the substation and associated works and infrastructure (e.g. new overhead gantries).

24.8.1.7 It is understood that works to the existing substation will be undertaken via NGET's permitted development rights. The proposed extension to Bodelwyddan substation will require planning consent. At the time of writing, an application had not been submitted to Denbighshire County Council, but the anticipated timeframe is early 2024. Given that an application has not been submitted, the potential cumulative impacts of the Bodelwyddan upgrade have not been assessed within the PEIR. This will be re-visited in the application for consent for the Mona Offshore Wind Project should further information become available.

Table 24.34: List of other projects, plans and activities considered within the CEA.

Project/Plan	Status	Distance from the Mona Proposed Onshore Development Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tier 1						
Major Development: 40/2021/0309	Planning application approved within the last five years	0.8	Erection of a 198 bed Registered Care Home (Use Class C2), landscaping, parking facilities and associated works (Resubmission)	2026 to 2029	N/A	Construction of this project coincides with construction of the Mona Offshore Wind Project for two years.
Awel Y Môr Offshore Windfarm	Submitted but not yet determined	0.0	Awel y Môr Offshore Wind Farm is a project being developed by RWE Renewables (RWE) to the west of the existing Gwynt y Môr Offshore Wind Farm. It is located approximately 10.5km off the Welsh coast in the Irish Sea, with a maximum total area of 78 square kilometres (km ²).	2024 to 2027	2030 to 2055	Construction of Awel y Môr Offshore Wind Farm coincides with the entire four-year construction phase of the Mona Offshore Wind Project (i.e. 2026 to 2029).

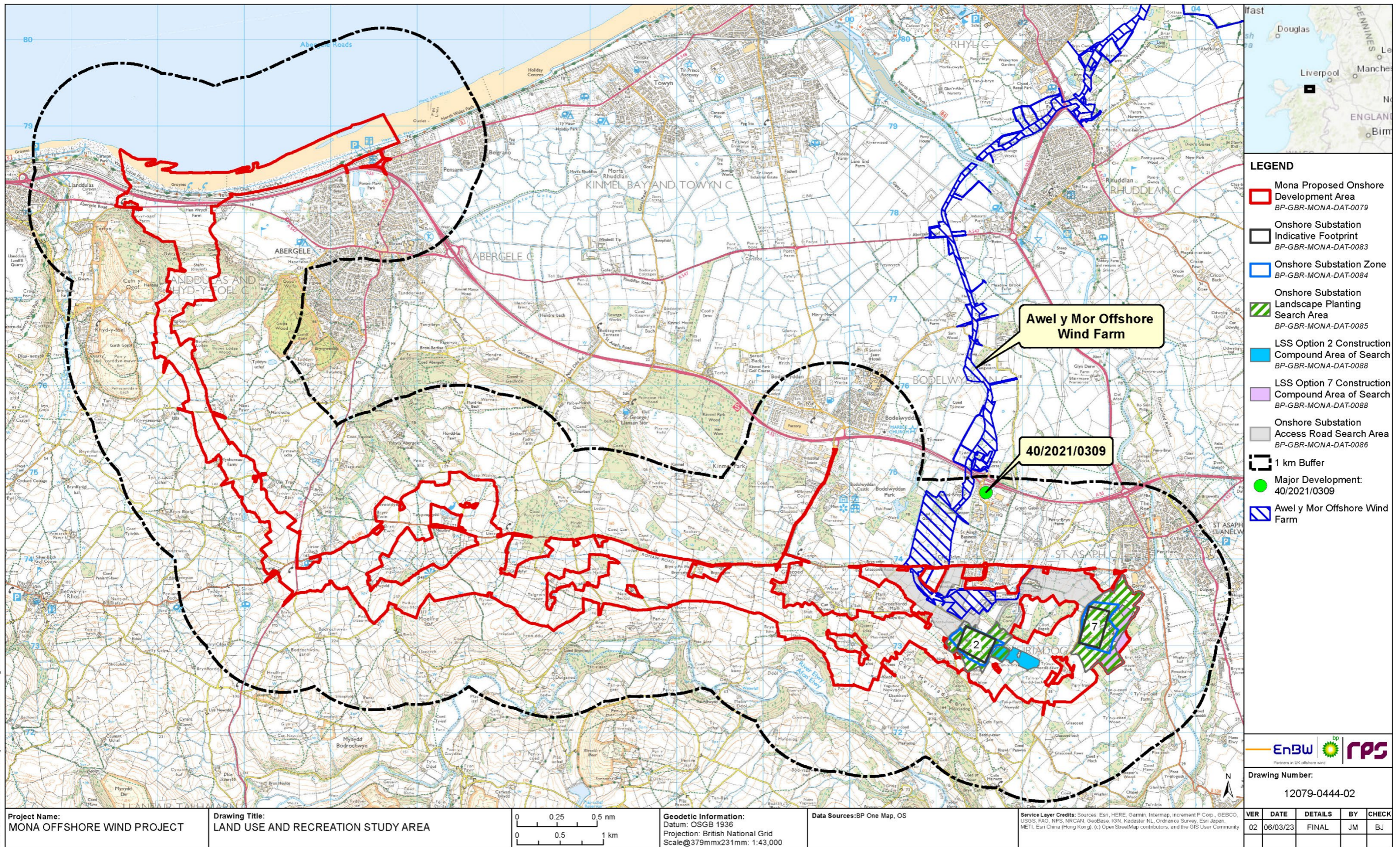


Figure 24.3: Other projects, plans and activities screened into the cumulative effects assessment.

24.8.2 Maximum design scenario

24.8.2.1 The MDSs identified in Table 24.35 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been selected from the Project Design Envelope provided in volume 1, chapter 3: Project Description, of the PEIR as well as the information available on other projects and plans, in order to inform a 'MDS'. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g. different turbine layout), to that assessed here, be taken forward in the final design scheme.

Table 24.35: Maximum design scenario considered for the assessment of potential cumulative effects on intertidal on onshore ornithology.

^a C=construction, O=operation and maintenance, D=decommissioning

Potential cumulative effect	Phase ^a			Maximum Design Scenario	Justification
	C	O	D		
The impact of temporary and permanent habitat loss during construction and decommissioning of the Mona Offshore Wind Project.	✓	×	✓	Maximum design scenario as described for the Mona Offshore Wind Project (Table 24.21) assessed cumulatively with the following other projects/plans: Tier 1 <ul style="list-style-type: none"> 40/2021/0309 Awel Y Môr Offshore Windfarm. 	Outcome of the CEA will be greatest when the greatest number of other plans are considered. Only Tier 1 schemes within 1km of the Mona Proposed Onshore Development Area that involve building upon undisturbed land (greenfield) have been included, those plans which involve demolition of existing buildings (brownfield) to create the footprint for new development are not considered to impact upon cumulative habitat loss. No plans involve temporary or permanent intertidal habitat loss within 1km of the Mona Proposed Landfall. Therefore, this CEA should only be considered for the onshore ornithology study area.
The impact of habitat disturbance during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. All Tier 1 and Tier 2 plans within 1km of the Mona Proposed Onshore Development Area are considered as disturbance travels beyond the source point and is dependent upon the ZOI of the VORs involved. No plans involve disturbance of the intertidal zone within 1km of the Mona Proposed Landfall. Therefore, this CEA should only be considered for the Mona onshore ornithology study area
The impact of habitat fragmentation and species isolation during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. Only greenfield Tier 1 schemes within 1km of the Mona Proposed Onshore Development have been included, brownfield plans are not considered to impact upon cumulative habitat fragmentation and species isolation. All Tier 2 plans have been considered as the CEA will be greatest if all of this land is lost to development. No plans involve temporary or permanent intertidal habitat fragmentation within 1km of the Mona Proposed Landfall. Therefore, this CEA should only be considered for the Mona onshore ornithology study area.
The impact of pollution caused by accidental spills/ contaminant release during constructions and decommissioning of the Mona Offshore Wind Project.	✓	×	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. All Tier 1 and Tier 2 plans within 1km of the Mona Proposed Onshore Development Area are considered as spills and/or contaminant release is possible on all projects. No plans involve works on the intertidal zone within 1km of the Mona Proposed Landfall. Therefore, this CEA should only be considered for the Mona onshore ornithology study area.
The impact of spreading Invasive and Non-native Species (INNS) during construction and decommissioning of the Mona Offshore Wind Project.	✓	×	✓		Outcome of the CEA will be greatest when the greatest number of other plans are considered. All Tier 1 and Tier 2 plans within 1km of the Mona Proposed Onshore Development Area are considered as all plans (brownfield as well as greenfield) run the risk of spreading INNS. No plans involve works on the intertidal zone within 1km of the Mona Proposed Landfall. Therefore, this CEA should only be considered for the Mona onshore ornithology study area.

24.9 Cumulative effects assessment

24.9.1.1 The 1km study area distance used for the purposes of the CEA was based on the approach adopted for other Nationally Significant Infrastructure Projects (NSIPs), including Awel Y Môr Offshore Wind Farm and Hornsea 3 Offshore Wind Farm. Awel Y Môr Offshore Wind Farm adopted a 500m study area for the CEA and was selected as this project is located within a similar geographical area. Hornsea 3 Offshore Wind Farm adopted a 1km study area for the CEA and was selected as this project coincided with onshore habitats likely to support similar assemblages of intertidal and onshore birds. Based on the information presented in the Environmental Statements for these projects, the 1km study area distance was considered appropriate for the CEA of the Mona Offshore Wind Project.

24.9.1.2 A description of the significance of cumulative effects upon onshore and intertidal ornithological receptors for all impacts identified in this project has been considered.

24.9.1.3 Two Tier 1 projects/plans have been identified as having potential cumulative impact pathways with the Mona Offshore Wind Project, these are the construction of the Awel Y Môr Offshore Windfarm, anticipated to commence construction in 2026 and the planned construction of project 40/2021/0309 which is for the erection of 198 bed Registered Care Home (Use Class C2), landscaping, parking facilities and associated works, also commencing in 2026.

24.9.1.4 Neither the Awel Y Môr Offshore Windfarm or the project 40/2021/0309 (198 bed Registered Care Home) assessed the impacts listed below. Therefore, in accordance with Volume 1, chapter 5: Environmental Impact Assessment methodology, a Cumulative Effects Assessment (CEA) has not been carried out on the following impacts due to a lack of data availability.

- Habitat fragmentation and species isolation
- Pollution caused by accidental spills/ contaminant release
- Spreading INNS.

24.9.1.5 The impacts of temporary or permanent habitat loss and habitat disturbance are assessed, to differing extents for onshore birds in both the Awel Y Môr Offshore Windfarm Environmental Statement, volume 3, chapter 3.5: Onshore Biodiversity and Nature Conservation and project 40/2021/0309 Preliminary Ecological Appraisal: Etive Ecology Ltd. A review of these assessments, even if only initial, has enabled the significance of cumulative impacts to be assessed for both temporary or permanent habitat loss and habitat disturbance.

24.9.1.6 No Tier 2 projects and plans have been identified in the screening process for this chapter's assessment which have effect-receptor pathways. A full list of projects and plans reviewed for the CEA assessment are presented in volume 5, annex 5.1: CEA screening matrix.

24.9.2 Temporary or permanent habitat loss

24.9.2.1 Construction, operations, and maintenance and decommissioning of the Mona Offshore Wind Project may result in the temporary (e.g. onshore cable) or permanent (e.g. Mona Onshore Substation) loss of habitat, which may support protected or notable species. The MDS is represented by the maximum surface area

of habitat loss and disturbed and is summarised in Table 24.21. Cumulatively these impacts have the potential to be greater when combined with impacts from projects and plans identified with impact pathways (Awel Y Môr Offshore Windfarm and Project 40/2021/0309: Erection of 198 bed Registered Care Home).

24.9.2.2 Construction in Mona Proposed Onshore Development Area and the construction of other identified projects listed within the CEA have the potential to impact waders foraging in the intertidal zone between MHWS and MLWS and breeding birds either nesting and/or foraging onshore in the Mona Proposed Onshore Development Area. These impacts are described in further detail below, and include the potential loss of foraging habitat in the intertidal area for wader VORs which have the potential to increase daily energetic costs that could affect individual birds survival and the loss of breeding and foraging habitat for breeding birds onshore, which has the potential to limit suitable foraging resources and/or nesting habitat both of which could affect productivity.

24.9.2.3 The construction of project 40/2021/0309: Erection of 198 bed Registered Care Home is planned to be located on a site just north of St Asaph Business Park and covers an area of approximately 1.5ha. This development area comprises habitat that is described as short growing colonising habitat on largely bare ground and generally considered to be of low ecological value. The main body of the site provides limited nesting habitat for birds, whilst scrub habitat on the boundary of the site provides good habitat for common nesting birds, including dunnock *Prunella modularis*, mistle thrush *Turdus viscivorus* and bullfinch *Pyrrhula pyrrhula*, all recorded at the site. In considering key ecological receptors the site is considered of moderate value for nesting birds with lots of nesting opportunities in the woodland and scrub on the margins of the site but no/ low opportunities in the main body of the site and overall, the site is of only local value to birds (ref: Preliminary Ecological Appraisal: Etive Ecology Ltd).

24.9.2.4 The construction of Awel Y Môr Offshore Windfarm includes the construction of an onshore Electronic Cable Corridor (ECC), with planned landfall on the intertidal area east of Rhyl and routing south to Pentre-mawr and incorporating permanent sub-stations (ref: Awel Y Môr Offshore Windfarm Environmental Statement, volume 3, chapter 3.5: Onshore Biodiversity and Nature Conservation). A full assessment of potential impacts on important ecological features has not yet been completed with surveys ongoing and full findings not presented in the PEIR, albeit the PEIR does present an initial assessment based upon desk-based studies of the potential impact of habitat loss, temporary or permanent on breeding and wintering birds.

Construction and decommissioning phase

Magnitude of impact

All receptors

24.9.2.5 For the assessment of impacts for the Mona Offshore Wind Project, temporary habitat loss as the result of cable construction and decommissioning was identified as potentially leading to temporary avoidance of the affected areas. However, for each VOR the impact at the population-level is undetectable given that displaced birds may re-locate to other areas to meet their daily energy requirement and that

birds will return to the disturbed habitat following completion of the work. For all VORs the magnitude of impact was determined to be negligible.

24.9.2.6 The initial assessment of habitat loss, either temporary or permanent, for the Awel Y Môr Offshore Windfarm does not include an assessment of the magnitude of impacts but determines initially the significance of the impact to be not significant at landfall for intertidal waterbirds. Cumulatively, the impact is therefore also unlikely to be detectable at the population level for each intertidal VOR.

24.9.2.7 Similarly, an initial assessment of habitat loss, either temporary or permanent, for the Awel Y Môr Offshore Windfarm for breeding birds is that there would be no significant impact.

24.9.2.8 The ecological assessment undertaken for project 40/2021/0309: Erection of 198 bed Registered Care Home, concluded that impacts would be limited to the local loss of the 1.5ha and habitat comprising ephemeral / short perennial habitat which is of limited value to nesting birds and moderate value for foraging and is therefore considered to be minor impact.

24.9.2.9 The cumulative effect is predicted to be of local spatial extent, short/medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

All receptors

24.9.2.10 Waterbirds and in particular waders are very vulnerable to the loss of foraging habitats on their wintering grounds. Similarly breeding birds are vulnerable to habitat loss, which is one of the greatest threats to birds' survival and productivity and therefore each VOR is highly vulnerable to the loss of habitats.

24.9.2.11 All ornithological VORs are deemed to be of high vulnerability, medium recoverability, and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

All receptors

24.9.2.12 Overall, the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptor is high. The cumulative effect will, therefore, be of **minor** adverse significance, which is not significant in EIA terms.

Operation and maintenance phase

Magnitude of impact

All receptors

24.9.2.13 Neither of the screened in Tier 1 projects under consideration in the CEA will involve the permanent loss of intertidal or nearshore habitat. Therefore, impacts upon seabird and waterbird VORs can be screened out of the CEA for the operations and maintenance phase.

24.9.2.14 An initial assessment of habitat loss, either temporary or permanent, for the Awel Y Môr Offshore Windfarm for breeding birds is that there would be no significant impact. There was a similar conclusion for project 40/2021/0309: Erection of 198 bed Registered Care Home and crucially none of the breeding bird VORs screened in for this assessment were found to be present at either project. The magnitude of impact upon the breeding bird VORs can therefore be considered **no change**.

Sensitivity of the receptor

All receptors

24.9.2.15 As discussed in paragraph 24.9.2.10, all ornithological VORs are deemed to be of high vulnerability, medium recoverability, and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

All receptors

24.9.2.16 Overall, the magnitude of the cumulative impact is deemed to be no change, and the sensitivity of the receptor is high. The cumulative effect will, therefore, be of **no change**.

24.9.3 Habitat disturbance

24.9.3.1 Construction and decommissioning of the Mona Offshore Wind Project may result in the disturbance of habitat (e.g. movement, noise, light spill, vibration), which may support protected or notable species. The MDS is represented by the maximum number of vehicles (including heavy machinery) and personnel that could cause the greatest impact and is summarised in Table 24.21. Cumulatively these impacts have the potential to be greater when combined with impacts from projects and plans identified with impact pathways (Awel Y Môr Offshore Windfarm and Project 40/2021/0309: Erection of 198 bed Registered Care Home).

24.9.3.2 Construction at the Mona Proposed Onshore Development Area has the potential to impact waders foraging or loafing in the Mona Proposed Landfall and breeding birds nesting and/or foraging onshore in the Mona Proposed Onshore Development Area. These impacts are described in further detail below and include the potential disturbance and displacement from foraging habitat in the intertidal area for seabird and waterbird VORs, resulting in the potential reduced availability of foraging resources, increased energetic costs and reduced survival. Similarly, the impact of disturbance for breeding birds onshore has the potential to impact individual birds by displacing them from suitable foraging habitat and thereby affecting their food resource availability and ability to be reproductively successful.

Construction phase

Magnitude of impact

All receptors

- 24.9.3.3 For the assessment of impacts for the Mona Offshore Wind Project, habitat disturbance caused during construction and decommissioning was identified as potentially leading to temporary avoidance of the affected areas. However, for each VOR the impact at the population-level is undetectable given that displaced birds may re-locate to other areas to meet their daily energy requirement and that birds will return to the disturbed habitat following completion of the work. For all VORs the magnitude of impact was determined to be negligible.
- 24.9.3.4 The initial assessment of habitat disturbance for the Awel Y Môr Offshore Windfarm does not include an assessment of the magnitude of impacts but determines the significance of the impact to be not significant at landfall for intertidal waterbirds. Cumulatively, the impact is therefore also unlikely to be detectable at the population level for each intertidal VOR.
- 24.9.3.5 Similarly, an initial assessment of disturbance for the Awel Y Môr Offshore Windfarm for breeding birds concludes that there would be no significant impact.
- 24.9.3.6 The ecological assessment undertaken for project 40/2021/0309: Erection of 198 bed Registered Care Home, did not directly assess the impact of habitat disturbance beyond the 1.5ha development site, albeit it discusses the likely impact of the clearance of suitable nesting habitat in the site for which a risk of harm and disturbance to nesting birds exists if works are undertaken during the nesting season. Given this limited assessment and the location of the development, which is more than 500m from the Mona Proposed Onshore Development Area and separated by a business park, major roads and other buildings, no impact is considered possible for VORs identified at the Mona Proposed Landfall and within the Mona Proposed Onshore Development Area. No additional impact has been identified that would contribute to the cumulative impact assessment.
- 24.9.3.7 The cumulative effect is predicted to be of local spatial extent, short/medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

All receptors

- 24.9.3.8 To differing extents each of the wader VOR species and breeding bird VOR species, all of which are of high conservation importance, are sensitive to and vulnerable to the impact of disturbance and displacement from either foraging or breeding habitats and are therefore vulnerable to the potential impact of habitat disturbance.
- 24.9.3.9 Ornithological VORs are deemed to be of high vulnerability, medium recoverability, and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

All receptors

- 24.9.3.10 Overall, the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor** adverse significance, which is not significant in EIA terms.

Operation and maintenance phase

- 24.9.3.11 Operation and maintenance activities within the Mona Proposed Onshore Development Area and the other projects and plans considered in this cumulative assessment will be less than those carried out during the construction and decommissioning phases.

Significance of the effect

All receptors

- 24.9.3.12 Overall, the magnitude of the impact during decommissioning is deemed to be negligible and the sensitivity of the receptor is medium to high, depending on the species. The effect will, therefore, be of **minor** adverse significance, which is not significant in EIA terms.

24.9.4 Future monitoring

- 24.9.4.1 No onshore and intertidal ornithology monitoring to test the predictions made within the cumulative impact assessment is considered necessary.

24.10 Transboundary effects

- 24.10.1.1 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to the onshore and intertidal ornithology from the Mona Offshore Wind Project upon the interests of other states.

24.11 Inter-related effects

- 24.11.1.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:
- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Mona Offshore Wind Project (construction, Operations and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases.
 - Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on onshore and intertidal ornithology, such as habitat loss and disturbance may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects

may be short term, temporary or transient effects, or incorporate longer term effects.

- 24.11.1.2 A description of the likely interactive effects arising from the Mona Offshore Wind Project on onshore and intertidal ornithology is provided in volume 2, chapter 25: Inter-related effects – onshore of the PEIR.

24.12 Summary of impacts, mitigation measures and monitoring

- 24.12.1.1 Information on onshore and intertidal ornithology within the onshore ornithology study area and the intertidal ornithology study area was collected through review of available literature, other assessments, UK statutory guidance, detailed analysis of the data collected during site-specific surveys, and consultation with relevant stakeholders.

- Table 24.36 presents a summary of the potential impacts, measures adopted as part of the project and residual effects in respect onshore and intertidal ornithology. The impacts assessed include: temporary and permanent habitat loss, habitat disturbance, habitat fragmentation and species isolation, pollution caused by accidental spills/contaminant and the spread of INNS. Overall it is concluded that there will be no significant effects arising from the Mona Offshore Wind Project during the construction, operations and maintenance or decommissioning phases.
- Table 24.37 presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impacts assessed include: temporary and permanent habitat loss, habitat disturbance, habitat fragmentation and species isolation, pollution caused by accidental spills/contaminant and the spread of INNS. Overall it is concluded that there are no significant cumulative effects to any species from the Mona Offshore Wind Project alongside other projects/plans.
- Potential transboundary impacts have been identified in relation to onshore and intertidal ornithology. Overall, it is concluded that there will be no significant transboundary effects arising from the Mona Offshore Wind Project.

Table 24.36: Summary of potential environmental effects, mitigation and monitoring.

^a C=construction, O=operations and maintenance, D=decommissioning

Description of impact	Phase ^a			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
The impact of temporary and permanent habitat loss during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	<u>Common scoter</u> C: Negligible D: Negligible	<u>Common scoter</u> C: High D: High	<u>Common scoter</u> C: Minor adverse D: Minor adverse	Pre-construction checks will ascertain if further mitigation is needed for breeding red kite and little ringed plover. This will be outlined in the Breeding Bird Protection Plan which will be delivered as part of the Hydrology, Ecology and Landscape Management Plan (see Table 24.23).	<u>Common scoter</u> C: Minor adverse D: Minor adverse	None
					<u>Red-throated diver</u> C: Negligible D: Negligible	<u>Red-throated diver</u> C: High D: High	<u>Red-throated diver</u> C: Minor adverse D: Minor adverse		<u>Red-throated diver</u> C: Minor adverse D: Minor adverse	
					<u>Red-breasted merganser</u> C: Negligible D: Negligible	<u>Red-breasted merganser</u> C: High D: High	<u>Red-breasted merganser</u> C: Minor adverse D: Minor adverse		<u>Red-breasted merganser</u> C: Minor adverse D: Minor adverse	
					<u>Great cormorant</u> C: Negligible D: Negligible	<u>Great cormorant</u> C: High D: High	<u>Great cormorant</u> C: Minor adverse D: Minor adverse		<u>Great cormorant</u> C: Minor adverse D: Minor adverse	
					<u>Eurasian oystercatcher</u> C: Negligible D: Negligible	<u>Eurasian oystercatcher</u> C: High D: High	<u>Eurasian oystercatcher</u> C: Minor adverse D: Minor adverse		<u>Eurasian oystercatcher</u> C: Minor adverse D: Minor adverse	
					<u>Eurasian curlew</u> C: Negligible D: Negligible	<u>Eurasian curlew</u> C: High D: High	<u>Eurasian curlew</u> C: Minor adverse D: Minor adverse		<u>Eurasian curlew</u> C: Minor adverse D: Minor adverse	
					<u>Common redshank</u> C: Negligible D: Negligible	<u>Common redshank</u> C: High D: High	<u>Common redshank</u> C: Minor adverse D: Minor adverse		<u>Common redshank</u> C: Minor adverse D: Minor adverse	
					<u>Common ringed plover</u> C: Negligible D: Negligible	<u>Common ringed plover</u> C: High D: High	<u>Common ringed plover</u> C: Minor adverse D: Minor adverse		<u>Common ringed plover</u> C: Minor adverse D: Minor adverse	
					<u>Red kite</u> C: Negligible O: No change D: Negligible	<u>Red kite</u> C: High O: High D: High	<u>Red kite</u> C: Negligible O: No change D: Negligible		<u>Red kite</u> C: Negligible O: No change D: Negligible	
<u>Little ringed plover</u> C: Negligible O: No change D: Negligible	<u>Little ringed plover</u> C: High O: High D: High	<u>Little ringed plover</u> C: Negligible O: No change D: Negligible	<u>Little ringed plover</u> C: Negligible O: No change D: Negligible							

Description of impact	Phase ^a	Measures adopted	Magnitude of impact	Sensitivity of the	Significance of	Further mitigation	Residual effect	Proposed		
The impact of habitat disturbance during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	<u>Common scoter</u> C: Negligible O: Negligible D: Negligible	<u>Common scoter</u> C: High O: High D: High	<u>Common scoter</u> C: Minor adverse O: Minor adverse D: Minor adverse	None	<u>Common scoter</u> C: Minor adverse O: Minor adverse D: Minor adverse	None
					<u>Red-throated diver</u> C: Negligible O: Negligible D: Negligible	<u>Red-throated diver</u> C: High O: High D: High	<u>Red-throated diver</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Red-throated diver</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Red-breasted merganser</u> C: Negligible O: Negligible D: Negligible	<u>Red-breasted merganser</u> C: High O: High D: High	<u>Red-breasted merganser</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Red-breasted merganser</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Cormorant</u> C: Negligible O: Negligible D: Negligible	<u>Cormorant</u> C: High O: High D: High	<u>Cormorant</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Cormorant</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Oystercatcher</u> C: Negligible O: Negligible D: Negligible	<u>Oystercatcher</u> C: High O: High D: High	<u>Oystercatcher</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Oystercatcher</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Eurasian curlew</u> C: Negligible O: Negligible D: Negligible	<u>Eurasian curlew</u> C: High O: High D: High	<u>Eurasian curlew</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Eurasian curlew</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Common redshank</u> C: Negligible O: Negligible D: Negligible	<u>Common redshank</u> C: High O: High D: High	<u>Common redshank</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Common redshank</u> C: Minor adverse O: Minor adverse D: Minor adverse	
					<u>Common ringed plover</u> C: Negligible O: Negligible D: Negligible	<u>Common ringed plover</u> C: High O: High D: High	<u>Common ringed plover</u> C: Minor adverse O: Minor adverse D: Minor adverse		<u>Common ringed plover</u> C: Minor adverse O: Minor adverse D: Minor adverse	
<u>Red kite</u> C: Negligible O: Negligible D: Negligible	<u>Red kite</u> C: High O: High D: High	<u>Red kite</u> C: Minor adverse O: Minor adverse D: Minor adverse	<u>Red kite</u> C: Minor adverse O: Minor adverse D: Minor adverse							

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Description of impact	Phase ^a			Measures adopted	Magnitude of impact	Sensitivity of the	Significance of	Further mitigation	Residual effect	Proposed
	C	O	D							
					Little ringed plover C: Negligible O: Negligible D: Negligible	Little ringed plover C: High O: High D: High	Little ringed plover C: Minor adverse O: Minor adverse D: Minor adverse		Little ringed plover C: Minor adverse O: Minor adverse D: Minor adverse	
The impact of habitat fragmentation and species isolation during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	All receptors C: No change O: No change D: No change	All receptors C: Medium O: Medium D: Medium	All receptors C: No change O: No change D: No change	None	All receptors C: No change O: No change D: No change	None
The impact of pollution caused by accidental spills/contaminant release during construction and decommissioning of the Mona Offshore Wind Project.	✓	✗	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	All receptors C: Negligible D: Negligible	All receptors C: Medium D: Medium	All receptors C: Minor adverse D: Minor adverse	None	All receptors C: Minor adverse D: Minor adverse	None
The impact of spreading INNS during construction and decommissioning of the Mona Offshore Wind Project.	✓	✗	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	All receptors C: Negligible D: Negligible	All receptors C: Medium D: Medium	All receptors C: Minor adverse D: Minor adverse	None	All receptors C: Minor adverse D: Minor adverse	None

Table 24.37: Summary of potential cumulative environmental effects, mitigation and monitoring.

^a C=construction, O=operations and maintenance, D=decommissioning

Description of effect	Phase ^a			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Tier 1										
The impact of temporary and permanent habitat loss during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	All receptors C:Negligible O:No change D:Negligible	All receptors C:High O:High D:High	All receptors C:Minor O:No change D:Minor	Pre-construction checks will ascertain if further mitigation is needed for breeding red kite and little ringed plover. This will be outlined in the Breeding Bird Protection Plan which will be delivered as part of the Hydrology, Ecology and Landscape Management Plan (see Table 24.23).	All receptors C:Minor O:No change D:Minor	None

MONA OFFSHORE WIND PROJECT

Description of effect	Phase ^a			Measures adopted	Magnitude of	Sensitivity of the	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
The impact of habitat disturbance during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.	✓	✓	✓	Outline CoCP Pre-commencement breeding bird surveys ECoW Hydrology, Ecology and Landscape Management Plan	<u>All receptors</u> C:Negligible O:Negligible D:Negligible	<u>All receptors</u> C:High O:High D:High	<u>All receptors</u> C:Minor O:Minor D:Minor	None	<u>All receptors</u> C:Minor O:Minor D:Minor	None

24.13 Next steps

- 24.13.1.1 Further site-specific surveys, including intertidal ornithological surveys, breeding bird surveys and wintering and migratory birds surveys within the Mona Proposed Onshore Development Area remain ongoing and will be completed following publication of the PEIR and prior to submission of the Environmental Statement.
- 24.13.1.2 The findings of the migratory and wintering bird surveys (i.e. birds of prey and passerines) undertaken in winter 2022/23 will be presented to stakeholders as part of the Onshore Ecology EWGs.
- 24.13.1.3 The findings of the further site-specific surveys will be used to inform the relevant sections of the Environmental Statement and discussed with the relevant stakeholders as part of the Onshore Ecology EWGs.
- 24.13.1.4 In accordance with policy VOE 5 of the Adopted Local Development Plan 2006-2021 (Denbighshire County Council, 2013), a Biodiversity Statement will be prepared and submitted in support of the Environmental Statement. The Biodiversity Statement will set out how the Mona Offshore Wind Project would comply with Denbighshire County Council's objectives for conserving, enhancing, and restoring biodiversity.

24.14 References

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